



University of Colorado **Denver**

2016-17 Graduate Catalog

Addendum for
Programs and Courses Only

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Office of the Registrar

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Programs

Graduate Degree Programs

Accounting MS

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The master of science in accounting is a flexible program that allows students to design individualized courses of study including three designated specializations; auditing and forensic accounting, controllership and financial leadership, and accounting and information systems audit and control.

The program provides students the opportunity to acquire a thorough understanding of financial and managerial accounting, auditing, accounting information systems, and taxation in preparation for successful careers in public or private accounting, as well as government or nonprofit accounting. Students have ample opportunity to choose coursework necessary to sit for the CPA exam, the CMA exam and other similar professional accounting certifications.

The MS accounting degree consists of 30 required hours + 15 hours that may be waived based on prior coursework (9 hours of prerequisites + 6 hours of Common Body of Knowledge (CBK):

Accounting Prerequisites: (9 hours)

The MS in accounting requires completion of the following accounting prerequisites.

Required Prerequisite Courses (advisor will evaluate transcript for possible waivers, grades must be a C or better to be considered for possible waiver):

- ACCT 6030 - Financial Accounting
undergraduate equivalent: ACCT 3220 and ACCT 3230
ACCT 6031 will also be required as part of the 9 semester hours of prerequisites.
- ACCT 6070 - Management Accounting
undergraduate equivalent: ACCT 3320

Common Body of Knowledge (CBK): (6 hours)

Depending on prior coursework, students may be required to take up to two background courses (advisor will evaluate transcript for possible waivers in the CBK):

- BUSN 6530 - Data Analysis for Managers
- BUSN 6620 - Applied Economics for Managers

Accounting Core: (12 hours)

Students may not receive graduate credit for undergraduate coursework and may not retake any course successfully completed at the undergraduate level with a grade of "C" or better. An advisor will evaluate prior coursework to determine possible substitutions.

- BUSN 6540 - Legal and Ethical Environment of Business
- ACCT 6020 - Auditing Theory
- ACCT 6054 - Accounting Systems and Data Processing
- ACCT 6140 - Tax Planning for Managers

Accounting Capstone: (6 hours)

- ACCT 6250 - Seminar: Financial Accounting
- ACCT 6260 - Seminar: Managerial Accounting

Accounting Electives: (6 hours)

ACCT or MTAX courses numbered 6000 or higher excluding ACCT 6030 or ACCT 6070. Courses contributing to one of the specializations may be used to meet this elective requirement.

Free Electives: (6 hours)

Accounting careers are increasingly diverse, cutting across many industries, business functions and decisions. Accountants may eventually work as auditors, systems analysts and designers, financial planners, tax specialists, cost analysts, financial planning and budget officers, controllers, chief financial officers, or chief executive officers. Students will be better prepared for their careers if they develop additional competencies in a related field, which may be chosen from a single discipline such as finance, information systems, business analytics, entrepreneurship, international business, marketing, or management.

Free electives may consist of any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with a prefix of ACCT, BANA, CMDT, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, RISK, or MTAX excluding ACCT 6030 and ACCT 6070.

Total: 30 hours

Accounting Specializations

Students may use a combination of accounting and free electives to complete one of the following specialization options. Auditing and Forensic Accounting Specialization and Controllershship and Financial Leadership Specialization follow the MS Accounting requirements above. Accounting and Information Systems Audit and Controll Specialization follows the requirements listed below that specialization.

Auditing and Forensic Accounting Specialization

Students must complete one of the following two courses:

- ACCT 6025 - Auditing Practice
 - ACCT 6620 - Advanced Auditing
- Also complete three courses from the list below:
- ACCT 6024 - Advanced Financial Accounting
 - ACCT 6280 - Professional Judgment and Ethical Decisions in Accounting
 - ACCT 6320 - White Collar and Financial Crimes
 - ACCT 6330 - Fraud Auditing
 - ACCT 6340 - Financial Statement Analysis
 - ACCT 6360 - Fraud Examination
 - ACCT 6370 - International Accounting
 - ACCT 6380 - Forensic Accounting
 - ACCT 6470 - Internal Auditing
 - ACCT 6510 - Accounting and Information Systems Processes and Controls

Controllership and Financial Leadership Specialization

Complete this required course:

- ACCT 6220 - Controllership: Financial Strategy and Controls
- Complete three additional courses from the list below:
- ACCT 6024 - Advanced Financial Accounting
 - ACCT 6033 - Advanced Managerial Accounting
 - ACCT 6080 - Accounting for Government and Nonprofit Organizations
 - ACCT 6280 - Professional Judgment and Ethical Decisions in Accounting
 - ACCT 6285 - Accounting and Finance for Sustainability
 - ACCT 6340 - Financial Statement Analysis
 - ACCT 6350 - Current Issues in Professional Accounting
 - ACCT 6370 - International Accounting
 - ACCT 6520 - Issues in Oil and Gas Accounting

Accounting and Information Systems Audit and Control (AISAAC) Specialization

Recently, new regulatory environments have required companies to provide better documentation of their accounting and IT systems to improve the management and disclosure of their business processes for better financial and regulatory controls. Accounting and IT professionals have significant roles in audit and control activities, since they control the systems that monitor and report on finance, planning and operations. The courses within this specialization cover business-process management and financial controls; the emerging trends and practices in privacy and security; the strategies for integrating governance and compliance; and the IT organization's financial and business intelligence services. These courses will focus on how to leverage the existing IT infrastructure to establish quality in financial and internal audit processes and address the regulatory issues associated with reporting, consolidation and document/content management more effectively and completely.

As you will note, this degree plan is 30 hours + 12 hours prerequisite hours + 9 hours in Common Body of Knowledge (CBK) as listed below.

Accounting Prerequisites: (12 hours)

Undergraduate course equivalents must be completed with a "C" or better. Advisor will evaluate transcript for possible waivers.

- BUSN 6550 - Analyzing and Interpreting Accounting Information
- ACCT 6030 - Financial Accounting
- ACCT 6070 - Management Accounting
- ACCT 6054 - Accounting Systems and Data Processing

Common Body of Knowledge (CBK): (9 hours)

Advisor will evaluate transcript for possible waivers in the CBK.

- BUSN 6530 - Data Analysis for Managers
- BUSN 6620 - Applied Economics for Managers
- BUSN 6540 - Legal and Ethical Environment of Business

AISAAC Common Courses: (12 hours)

- ACCT 6020 - Auditing Theory
- ACCT 6510 - Accounting and Information Systems Processes and Controls
- ISMG 6040 - Business Process Management
- ISMG 6830 - IT Governance and Service Management

Accounting Core: (9 hours)

- ACCT 6620 - Advanced Auditing
- ACCT 6250 - Seminar: Financial Accounting
- ACCT 6260 - Seminar: Managerial Accounting

Additional Degree Requirements: (9 hours)

Select 3 of the following:

- ACCT 6340 - Financial Statement Analysis
- ACCT 6360 - Fraud Examination
- ACCT 6470 - Internal Auditing
- ISMG 6080 - Database Management Systems
- ISMG 6180 - Information Systems Management and Strategy
- ISMG 6220 - Business Intelligence Systems and Analytics
- ISMG 6430 - Information Systems Security and Privacy

Administrative Leadership and Policy Studies EdS

Administrative Leadership and Policy Studies

Requirements for Principal Licensure, the MA and EdS degrees, Executive Leadership Administrator License, and EdD and PhD with Administrative Leadership & Policy Studies concentrations

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Web site:

<http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/Pages/Administrative-Leadership-and-Policy-Studies.aspx>

Click on any of the following to go right to that information:

- Principal Licensure
- Master of Arts Degree
- Education Specialist Degree
- Executive Leadership Administrator Licensure Program
- EdD Leadership for Educational Equity with Principal or Administrator License
- PhD Education & Human Development with concentration in Administrative Leadership & Policy Studies

Faculty

For information about faculty in this area,

visit <http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/FacultyandResearch/Pages/Our-Faculty.aspx>.

The primary responsibility of the administrative leadership and policy studies (ALPS) faculty is to prepare leaders for public education in Colorado and the nation. Currently, the principal license is required for people seeking building-level administrative positions in Colorado. Alternatively, the administrator license may be required for district-level leadership positions in Colorado.

Principal Licensure Program

ALPS offers coursework that leads to eligibility to apply for the initial license for principal through the Colorado Department of Education. A passing score on the Principal PLACE content exam is also required for principal licensure through the Colorado Department of Education. Having earned an initial license, those who go on to complete a district sponsored induction program may then apply for a professional license by the Colorado Department of Education.

ALPS's 32 semester-hour principal licensure program is project-based, requiring students to present evidence of meeting both state and national standards through performance based assessments. A 400-hour clinical-practice experience is integrated throughout the four-semester program.

Students submit performance-based assessments (PBAs) during the principal licensure program to LiveText, an online assessment system. PBAs not approved by the end of the fourth semester must be completed within the two subsequent semesters (not including summer.)

Note: Those already holding a master's degree and 5 years of leadership in education should also see the Executive Leadership Program for pursuing administrator (superintendent) licensure.

Principal Licensure Cohort Options

Typically, cohorts are comprised of 25 principal candidates who move through the four-semester principal licensure program together. We look for applicants to have a teaching or special services license plus a minimum of three years post-licensure experience. We welcome applicants from all districts into our principal licensure cohorts. However, we partner with metro-area districts to prepare leaders specifically for their schools.

Distance Learning Cohort

The Distance Learning cohort option has a long history of serving students who live far away from campus. Additionally, this cohort offers students a hybrid (online and face-to-face) course format. Students meet in the first summer for a three-day boot camp. In the fall, they experience two Friday/Saturday weekend sessions. And, they attend two more weekend sessions the following spring. During the second summer, they attend a culminating half-day session. The rest of the work is completed online.

Denver Public Schools

The DPS cohort option is one of the DPS Pathways to Principalship. The work in this cohort is focused on leadership for ELL (English Language Learner) student populations as well as cultural leadership. Instructors and students work closely with not only state and national standards, but also with the LEAD Framework to prepare principals. Students meet on one Saturday and two Tuesdays a month over four semesters. A new cohort starts each spring. Please review this information on the DPS website.

Jefferson County Public Schools

The JeffCo cohort option is offered in partnership with Jefferson County Public Schools. Courses occur on twelve Tuesday evenings during each of the four semesters. This standards-based, performance-based assessed, cohort program is taught by university professors and experienced JeffCo administrators.

Northern Cohort

The Northern Cohort option is offered in partnership with the Boulder Valley School District for applicants from northern-metro districts. This cohort meets on Wednesday evenings during each of the four semesters of the program. This standards-based, performance-based assessed, cohort program is taught by university professors and experienced district administrators.

CU South Denver Cohort

The CU South Denver cohort serves southern-metro districts (Douglas County, Cherry Creek, Littleton, Sheridan, Englewood, Lewis-Palmer and Colorado Springs School District 11). This cohort meets on twelve Tuesdays during each of four semesters at the Liniger Building at CU South Denver. This standards-based, performance-based assessed, cohort program is taught by university professors and experienced district administrators.

Cohorts start at one or more locations each semester and involve a combination of regular in-person meetings (up to 15 times per semester) and online work.

EDUC 5751 - Principal/Administrator Licensing I. Semester Hours: 3 to 9

EDUC 5752 - Principal Administrator Licensing II. Semester Hours: 3 to 9

EDUC 5753 - Principal/Administrator Licensing III. Semester Hours: 3 to 9

EDUC 5754 - Principal or Administrator Licensing IV. Semester Hours: 3 to 9

Total: 32 Hours

MA Program

The MA is designed for those who do not already hold a graduate degree. Master's students will complete 9 semester hours beyond the 32 required in the licensure program, for a total of 41 semester hours of coursework. Candidates must also successfully complete a comprehensive exam paper, reflecting on how the three MA classes will help them in the role of principal.

For the MA degree, students must select at least one course in each of the following three areas plus complete the 32 semester hour principal license:

Section A: Educational Research

RSEM 5100 - Basic Statistics Semester Hours: 3

RSEM 5120 - Introduction to Research Methods Semester Hours: 3

RSEM 5110 - Introduction to Measurement Semester Hours: 3

Section B: Educational Foundations/Multicultural Education

EDFN 5050 - Critical Issues in American Education Semester Hours: 3

CLDE 5140 - Multicultural Education Semester Hours: 3

CLDE 5160 - Historical, Legal And Cultural Foundations For The Education Of Immigrant And Language Minority Stdn Semester Hours: 3

Section C: Education & Human Development/Special Education

EDHD 6100 - Advanced Child Growth and Development Semester Hours: 3

EDHD 5110 - Human Learning Semester Hours: 3

EDHD 6140 - Social Contexts of Adolescence and Schooling Semester Hours: 3

EDHD 5200 - Social Psychology of Learning Semester Hours: 3

SPED 5140 - Advanced Assessment in Special Education. Semester Hours: 3

SPED 5401 - Action Research and Leadership in Special Education Semester Hours: 3

SPED 5600 - Special Education for School Professionals. Semester Hours: 3

Candidates must also successfully complete a comprehensive exam paper, reflecting on how the three MA classes will help them in the role of principal.

EdS Program

The EdS degree program affords the opportunity for advanced graduate study and is available to those who already hold a master's degree. Generally, for the specialist degree students will complete 9 semester hours that constitute an area of focus, in addition to the 32 required in the principal licensure program. Candidates must also successfully complete a comprehensive exam paper, reflecting on how the three EdS classes will help them in the role of principal.

Administrator Licensure - Executive Leadership Program

Designed for the professional educator who, already holding a master's degree and 5 years leadership experience in education, wishes to apply for an initial administrator license through the Colorado Department of Education and prepare for a career as a superintendent or other district leader. In addition to coursework, a passing score on the Administrator PLACE content exam is also required for administrator licensure through the Colorado Department of Education. The 12-semester-hour administrator licensure program combines weekend meetings with online work and hands-on clinical practice-usually completed in participants' home districts:

EDUC 7500 - Strategic Human Capital Development

EDUC 7510 - Strategic Organizational Management

EDUC 7520 - Strategic System Improvement

EDUC 7530 - Strategic Leadership Development

These courses are differentiated for four student types: certificate students, administrator licensure students, EdS students, EdD students and PhD students. Learn more at www.ucdenver.edu/education/elp.

EdD Leadership for Educational Equity with Principal or Administrator License

Students interested in pursuing the principal or administrator license along with a doctorate should instead apply to the EdD Leadership for Educational Equity instead of to the MA or EdS Administrative Leadership & Policy Studies with Principal License or the Executive Leadership Administrator License. See the Ed Leadership for Educational Equity with Executive Leadership Principal or Administrator License for more information.

PhD Education and Human Development with concentration in Administrative Leadership and Policy

The Administrative Leadership & Policy Studies PhD concentration serves as a key area for those concerned about leadership in schools and a key focus for research by scholars in higher education. A crucial assumption the underlies this concentration area is that school leadership makes the difference in how schools succeed in improving learning outcomes for all students, but we are only beginning to scratch the surface in understanding why leadership is successful when it is, what the interactions are between

effective leadership and effective teaching, and their collective impact on learning outcomes at all levels in schools. See the PhD Education and Human Development for more information.

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EDHD 5200 - Social Psychology of Learning Semester Hours: 3
SPED 5140 - Advanced Assessment in Special Education. Semester Hours: 3
SPED 5401 - Action Research and Leadership in Special Education Semester Hours: 3
SPED 5600 - Special Education for School Professionals. Semester Hours: 3

Candidates must also successfully complete a comprehensive exam paper, reflecting on how the three MA classes will help them in the role of principal.

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Anthropology MA

- Graduate School Rules apply to this program.

Plans of Study

MA students may pursue the thesis or non-thesis option.

- **Thesis Option:** A thesis is characterized by three factors: 1) it is based in a research question or problem; 2) it involves original research; 3) there is a fully developed research proposal. A thesis can also encompass a range of format alternatives to the traditional thesis (e.g. article submitted for publication to a peer-reviewed journal, or a video production, internship or museum exhibit, each generally accompanied by a companion paper developing a theoretical or problem-oriented question). The thesis option requires 30 semester hours, including 4-6 hours of thesis.
- **Non-Thesis Option:** This track is defined by additional course work in lieu of a thesis. The non-thesis option requires 36 semester hours of course work.

Thesis Option

The thesis is a major requirement for those in the MA in anthropology thesis track. The thesis should demonstrate the student's ability to apply knowledge and skills gained from the anthropology department's curriculum. A desirable goal for an excellent thesis would be a work of sufficient rigor and quality that it could be considered for publication. Original data collection ("fieldwork") is recommended but not required for the thesis. Analysis of secondary data—whether quantitative, qualitative, visual or other formats—is perfectly acceptable as long as the research is informed by a clearly articulated research question and under-girded by a research proposal.

The traditional thesis is a single document that often incorporates a literature review, definition of a problem, discussion of methods to address the problem, the subsequent research activity and results. However, the student may design a thesis with different emphases, in consultation with their advisor. For example, the goal may instead be a more compact paper submitted to a peer-reviewed journal. Other thesis plans may combine some research activity such as a video production, museum exhibit or an internship, with an accompanying paper. Students pursuing the thesis option must develop a topic and research proposal that specifies their plans in the semester after their completion of 18 credit hours.

The thesis must be defended before a committee of three faculty, at least two of whom need to be on the Department of Anthropology faculty (which includes senior instructors and research faculty). The structure of the thesis is largely determined by the University of Colorado Denver Graduate School Rules; i.e., a thesis must conform to the rules.

1. For the thesis, students must prepare a full research proposal which must be approved by their thesis chair before beginning their research. This proposal must be completed by the semester after the student has completed 18 credit hours. Sections of the proposal should include, at a minimum:
 - a. Introduction and statement of the problem: Should include a one sentence statement of the problem on the first page, and a discussion of its significance (i.e., why is it important that this topic be researched).
 - b. Literature review covering theoretical and topical material.
 - c. Research design and methods including a data analysis plan.

Note: Wenner-Gren and National Science Foundation both provide good models and templates for the research proposal. Those in the medical anthropology track might want to consider following the NIH model, depending the nature of their research questions and career goals.
2. All students proposing to work with humans or data on modern humans must apply for and receive approval from the Human Subjects Research Committee before they begin their research. *Note:* most of the material for the application will be drawn from the research proposal.
3. The draft thesis must be reviewed and approved as "defensible" by the student's thesis committee faculty chair before a thesis defense date can be set. Defensible means the chair has reviewed the draft and suggested changes have been made.
 - a. The draft sent to the student's committee must be substantively complete: All references must be in the text and properly formatted in a references cited section; there should be no "track changes" comments in the text; the text should be formatted according to Graduate School requirements.
 - b. Given the complexity of faculty and student schedules, consultation on a defense date should be done as far in advance as possible.
 - c. There must be a minimum of three weeks between the agreed-upon date for the defense and distribution of the draft thesis defined as defensible by the student's chair. If you would like feedback from your committee members before the defense, you should plan to distribute the thesis at least 4 weeks before the defense date.

Note: If you intend to graduate the same semester you defend your thesis, you must schedule, successfully defend, and complete all recommended changes in accordance with CU Denver Thesis and Dissertation Guidelines. This effectively translates to having the thesis completed and "defensible" before the middle of the semester.

Non-Thesis Option

The non-thesis option allows students to pursue their own educational goals through the selection of additional courses that fit their interests. We strongly encourage students who choose this option to consider an internship position arranged around an area of expertise or the development of a skill-set. The internship may be in a governmental agency or non-governmental organization in Colorado, the U.S. or internationally. Successful completion of an internship will be acknowledged on the transcript of the MA program. The decision to pursue the non-thesis option should be made by the semester following the completion of 18 credit hours.

Additional Information

Students must maintain an overall GPA of 3.0 to remain in good standing and receive a grade of *B-* or better in a course to have it count toward graduation. The Graduate School on the Downtown Campus allows up to five years to complete a master's degree, but students are strongly discouraged from spending more than four years. While it is possible to finish the MA in two years, most of our students work part-time, which limits the time they can dedicate to the program; most finish within three years. Four semesters must be taken in residence at CU Denver. All students are required to pass a written comprehensive examination, taken after core course work has been completed.

Some students may benefit from adding a specific skills-based certificate program onto their graduate program. For example: archeology students may wish to gain expertise in Geographic Information Systems through the GIS certificate offered through the Department of Geography and Environmental Sciences, while medical anthropology students may benefit from the certificate in public health offered through the School of Public Health or the environmental health certificate through the Master of Science in Environmental Sciences program. Graduate-level courses in certificate programs can often fulfill elective requirements in the anthropology program.

One doctoral program at the CU Denver campus that may be of particular interest to graduates of the anthropology MA program is the PhD in Health and Behavioral Sciences . It is highly interdisciplinary and a natural extension of a master's degree in medical anthropology.

Course Requirements

Your graduate anthropology education begins by taking ANTH 5810, Integrating Anthropology, plus two core courses each from two subdisciplines of Anthropology. After completing this core, you will select from among the specialized elective courses in the research concentrations described in more detail below. You will work closely with an advisor in selecting the range of courses appropriate both to a problem orientation and to your career objectives.

Required core courses (18 semester hours)

Required in fall of first year:

- ANTH 5810 - Integrating Anthropology

All students must complete or demonstrate competence in the following:

- ANTH 5053 - Quantitative Methods in Anthropology

Choose two of the following three sets of core courses (Students are not required to take these courses sequentially)

Archaeology

- ANTH 6307 - Contemporary Perspectives in Archaeology
- ANTH 6317 - Archaeological Research Design and Analysis

Biological

- ANTH 6503 - Biological Anthropology Core: The Fossil Record

- ANTH 6513 - Biological Anthropology Core: Modern Human Variation

Cultural

- ANTH 6063 - Qualitative Research Design and Methods
- ANTH 6103 - Current Theory in Ethnography

Research Concentrations (8-18 semester hours)

You will round out your program by selecting from the diverse range of courses offered in the department according to your particular interests in anthropology, your career goals and your plans for future graduate study. You may take courses in one or more concentrations. The courses listed are suggestions only; you must work closely with your advisor in constructing your particular program of study.

MEDICAL ANTHROPOLOGY

Our MA program in cultural anthropology offers a unique focus on Medical Anthropology. Medical anthropology is a subdiscipline of anthropology that includes the study of all aspects of health, illness and disease in human communities and populations. It draws on all of the perspectives that distinguish anthropology as a unique discipline: the analysis of human evolution and adaptation; cultural development, expressions, and variability; and historical change and continuity. Medical anthropology takes as its subject a broad range of specific topics, including the study of health care systems, factors that affect the distribution and determinants of disease in populations, maternal and child health, nutrition and food habits, human development, political ecology, health policy, health disparities, community-driven wellness practices, visual storytelling, social media designed to promote health equities, and language and communication in health care contexts.

Faculty members take a variety of theoretical approaches to the topic, but our program is distinguished by its applied and engaged perspectives. A particular strength of our program is its integration of theoretical knowledge with community- and field-based training opportunities and challenges. We prepare students for careers in nonprofit and community groups, non-governmental organizations, advocacy, public health, health care institutions, and health sciences research; our graduates also attend doctoral programs at selective institutions. Courses in the department are complemented by electives in other departments (sociology, biology, psychology, history, geography, political science) and programs on the CU Denver campus (public affairs, education, health administration) and at the Anschutz Medical Campus (Schools of Medicine, Public Health, Pharmacy and Nursing).

Courses

As part of the MA degree, students may take between 6 and 18 credits of electives in this track, choosing from:

- ANTH 5000 - Special Topics in Anthropology
- ANTH 5014 - Medical Anthropology: Global Health
- ANTH 5040 - Anthropology of Food and Nutrition
- ANTH 5060 - Evolutionary Medicine
- ANTH 5080 - Global Health Practice
- ANTH 5090 - Political Economy of Drugs

- ANTH 5150 - Human Biocultural Adaptability
- ANTH 5180 - The Nature of Power
- ANTH 5290 - Anthropology and Public Health
- ANTH 5300 - Migrant Health
- ANTH 5350 - Anthropology of Globalization
- ANTH 5450 - Development and Conservation: Contemporary Issues
- ANTH 5460 - Development and Conservation: Theory and Practice
- ANTH 5600 - Medical Anthropology
- ANTH 5800 - Special Topics in Medical Anthropology
- ANTH 5200 - Gender in Cross-Cultural Perspective

Note: Students are encouraged to take elective courses in GIS mapping (geography), ecology (biology/anthropology), public policy, public health, epidemiology and biostatistics as it is relevant to their course of study.

ARCHAEOLOGY

The archaeological studies program concentrates on the study of past human societies using archaeological data collected in field and museum settings. While a quantitative and scientific approach is emphasized, the theoretical perspectives employed draw heavily from political economy and cultural ecology. The department offers a variety of theoretical, methodological and area courses, which may be supplemented by others in the geography and environmental sciences and history departments. Internships are available in local museums and historic preservation offices in the Denver metropolitan area.

Courses

- ANTH 5320 - Archaeology of Mexico and Central America
- ANTH 5330 - Lithic Analysis
- ANTH 5380 - Archaeology of Hunters-Gatherers
- ANTH 5400 - Archaeology of Power and Inequality
- ANTH 5570 - Landscape Archaeology
- ANTH 5580 - Neanderthals and the Origin of Modern Humans
- ANTH 5910 - Field Experience in Archaeology
- GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing
- GEOG 5080 - Introduction to GIS
- GEOG 5220 - Environmental Impact Assessment
- HIST 5231 - History in Museums
- HIST 5232 - Historic Preservation
- HIST 5234 - Introduction to Public History

BIOLOGICAL ANTHROPOLOGY

The biological anthropology concentration is concerned with modern human biological diversity and the past evolutionary history that has led to such diversity. Students in this concentration develop a firm understanding of the evolutionary processes that lead to physical and behavioral variation in humans and nonhuman primates. The concentration also emphasizes the theoretical and quantitative methods used to explore and explain this variation. Students may take courses in diverse areas including evolutionary

biology, genetics, ecology, ethnobiology, epidemiology, nutrition, medical anthropology, paleoanthropology, paleontology and primatology. Because biological anthropology is multidisciplinary in nature, students are encouraged to consider courses offered outside the department.

Courses

- ANTH 5014 - Medical Anthropology: Global Health
- ANTH 5030 - Ethnobiology
- ANTH 5040 - Anthropology of Food and Nutrition
- ANTH 5060 - Evolutionary Medicine
- ANTH 5150 - Human Biocultural Adaptability
- ANTH 5500 - Advanced Issues in Human Evolution
- ANTH 5530 - Anthropological Genetics
- ANTH 5550 - Primate Comparative Anatomy
- ANTH 5560 - Human Ecology
- ANTH 5580 - Neanderthals and the Origin of Modern Humans
- ANTH 5640 - Darwinian Approach to Human Behavior
- BIOL 5074 - Human Reproductive Biology
- BIOL 5134 - Human Genetics
- BIOL 5494 - Population and Evolutionary Genetics
- HBSC 7031 - Human Ecology and Environmental Adaptation
- HBSC 7310 - Environmental Epidemiology

DEGREE TOTAL HOURS

Thesis Option: 30 Hours (including 4-6 hours of thesis)

Non-Thesis Option: 36 Hours

Applied Geography & Geospatial Science MA

► Graduate School Rules apply to this program

Program Director: Anne Chin

Office: North Classroom, 3522

Telephone: 303.556.3958

Fax: 303.556.6197

E-mail: anne.chin@ucdenver.edu

Web site: Applied Geography & Geospatial Science MA

Faculty

Professors:

Anne Chin, PhD, Arizona State University

Pamela Jansma, PhD, Northwestern University (CLAS Dean)

Associate Professors:

Casey Allen, PhD, Arizona State University
Peter Anthamatten, PhD, University of Minnesota
Frederick B. Chambers, PhD, Arizona State University
Rafael Moreno-Sanchez, PhD, Colorado State University
Brian Page, PhD, University of California, Berkeley
Gregory Simon, PhD, University of Washington
Deborah S.K. Thomas, PhD, University of South Carolina
Bryan S. Wee, PhD, Purdue University
John W. Wyckoff, PhD, University of Utah

Associate Professors- Clinical Teaching Track:

Rudi Hartmann, PhD, Technical University of Munich

Assistant Professors:

Christy Briles, PhD, University of Oregon

Senior Instructors:

Amanda Weaver, PhD, University of Denver

Instructors:

Matthew Cross, MA, University of Nebraska, Lincoln

Lecturers:

Richard DeGrandchamp
Michael Hinke

In the United States and around the world, balancing the preservation of the natural environment with the imperatives of economic development along with concerns for social well-being has led to a growing demand for broadly trained individuals who can identify and understand pressing social and environmental issues, collect and analyze relevant data, and develop and implement innovative solutions. Graduates of the proposed M.A program in Applied Geography and Geospatial Science will have the knowledge, training, and tools to become leaders in this rapidly growing field.

The program's research focus is human-environment interaction, a longstanding hallmark of the discipline of Geography. Within this area of critical geographic inquiry, the program emphasizes geospatial science, a federally recognized STEM subject area that includes geographic information systems (GIS) as well as computer cartography, remotely sensed image analysis, and spatial statistics. Students apply their geospatial research skills in the context of hands-on, faculty-led research projects that stress professional development through community engagement and interactive service learning.

Requirements for Admission

Applicants must hold a Bachelor's degree from an accredited institution.

The University of Colorado Denver has a minimum requirement of 3.0 undergraduate grade point average (GPA) for applicants to the Graduate School. The number of applicants admitted to the MA in Applied Geography & Geospatial Science in any year depends, in part, on space availability. The program is competitive, and we generally discourage applicants whose undergraduate GPA is below 3.0. Notification

of acceptance or refusal for admission into the program is mailed to the applicant approximately six weeks after the deadline for submission of applications.

Application Process

We accept applications once per year, **before or on January 20th**, for admission in the following fall. As part of the admission review process, applicants are required to submit: a graduate application, statement of purpose that articulates the goals of pursuing a graduate degree in this program, a writing sample, a minimum of three letters of recommendation (academic references are preferred), and official transcripts from all institutions previously attended. GRE scores are also required from domestic students with an undergraduate GPA below 3.0 and all international students.

Financial Aid

There are three types of financial aid available: teaching assistant student hourly positions; research assistantship positions funded by grants to specific program faculty; and the regular package of financial aid (primarily loans) available through the financial aid office on the Denver campus. Incoming students will be automatically considered for program-distributed assistance at the time of admission to the program. Continuing students will be regularly apprised of available aid and positions. All other aid should be requested through the CU Denver Financial Aid Office, Student Commons Building 5th floor, Campus Box 125, P.O. Box 173364, Denver, CO 80217-3364. Telephone: 303-315-1850.

Internships

Students in the Applied Geography & Geospatial Science MA program are strongly encouraged to contact the Experiential Learning Center for internships and paid positions related to geographical sciences. The Experiential Learning Center is located in the Tivoli Student Union, Suite 260. Telephone: 303-556-2250. Many students have had internships in federal agencies, such as the U.S. Environmental Protection Agency and the U.S. Geological Survey.

Degree Requirements

The program is offered by the faculty of the Department of Geography and Environmental Sciences in the College of Liberal Arts and Sciences. Students undertake 36 credit hours over a two-year period. These 36 hours include required core classes (9 credit hours), a required service learning studio (3 credit hours), and required geo-spatial science coursework (12 credit hours). Students can elect to undertake either of two tracks: the first "coursework" track involves a further 12 hours of elective courses, whereas the second "thesis" track involves 9 hours of electives, and preparation of a written thesis (3 credits).

Thesis Option

33 hours of coursework + 3 thesis hours:

- GEOG 6300 - Foundations Seminar in Human-Environmental Interaction (3 hours)
- GEOG 6700 - Integrated Methods (3 hours)
- GEOG 6750 - Research Design (3 hours)
- GEOG 6800 - Community-Based Research Practicum (3 hours)
- 12 hours of Geospatial Science courses

- 9 hours of Elective courses (up to 6 hours can be taken outside the Department of Geography & Environmental Sciences, as approved by advisor)
- GEOG 6950 - Master's Thesis (3 hours)

Non-thesis Option

36 hours of coursework:

- GEOG 6300 - Foundations Seminar in Human-Environmental Interaction (3 hours)
- GEOG 6700 - Integrated Methods (3 hours)
- GEOG 6750 - Research Design (3 hours)
- GEOG 6800 - Community-Based Research Practicum (3 hours)
- 12 hours of Geospatial Science courses
- 12 hours of Elective courses (up to 6 hours can be taken outside the Department of Geography & Environmental Sciences, as approved by advisor)

Notes

- Many of the electives have pre-requisites; students must have met these requirements in order to take the course.
- Students may transfer up to 9 hours of approved graduate-level credit into the program. These courses must be approved by the Graduate Director and they may not replace core courses.
- Students may take up to 6 credit hours of independent study approved by their advisor. If a student takes two independent study courses, these should be taken from separate faculty members. Independent study may not replace the core program requirements.
- Students may not count 4000-level courses towards electives in the program; this may be petitioned to the Graduate Committee in exceptional cases.
- By the end of the first semester, each student should identify and declare whether s/he is pursuing the thesis or non-thesis option. If intending to pursue the thesis option, the student should identify and gain agreement from a content advisor for guiding the thesis, filling out and submitting the appropriate departmental form.
- Students may enroll in thesis preparation and writing hours only after submission of signed committee form, which requires approval of the thesis proposal.
- Students will not receive a grade for thesis preparation and writing hours until the thesis is successfully defended.
- Students should fill out and submit all relevant department forms for their files.
- Students must follow the graduate school deadlines for submission of paperwork for the graduation application, comprehensive exam, and any other deadlines. Links to these can be found on the GES/MS website:
<http://www.ucdenver.edu/academics/colleges/CLAS/Departments/ges/Programs/MasterofScience/Pages/Forms.aspx>

Applied Mathematics MS

- Graduate School Rules apply to this program.

Program Requirements

Students must present 30 hours of course work and maintain a 3.0 GPA or above for the MS degree. At least 24 of these hours must consist of graduate-level (numbered 5000 or higher) mathematics courses. The remaining 6 hours must be either mathematics courses numbered 5000 or above or approved courses outside the department numbered 4000 or above.

Up to 9 semester hours of prior course work may be transferred in (subject to approval); these must be at the 5000 level or above with a B- or better grade. Courses already applied toward another degree (graduate or undergraduate) cannot be used toward the MS degree in applied mathematics. Additionally, the following MATH courses will NOT count toward a graduate degree: MATH 5000-5009, 5010, 5012-5015, 5017, 5198, 5250, and 5830.

A student may devote from 4 to 6 hours (of the 30 required hours) to the writing of a thesis. Following completion of course work, all candidates must make a one-hour oral presentation before a committee consisting of three graduate faculty members.

Students must take either applied analysis or real analysis and applied linear algebra. Additionally, students must either complete the degree requirements for an MS without concentration area or must fulfill specific course work requirements for one of the following areas of specialization:

- Applied Probability
- Applied Statistics
- Discrete Mathematics
- Mathematics of Science and Engineering
- Numerical Analysis
- Operations Research

All master's degree students are encouraged to participate in the Math Clinic, a unique program in which students have an opportunity to work on real-world problems supplied by local businesses, research firms and government agencies.

For more detailed information about the applied mathematics MS, see www.math.ucdenver.edu/ms

Architecture MArch

In Colorado's only graduate architecture program, we prepare students for entry into the profession and licensure. Our mission is to lead in the discovery, communication and application of knowledge in the discipline of architecture by integrating theory and practice. In this collaborative educational model, environmental, economic, social, cultural, aesthetic and ethical concerns are fundamental.

Our program responds to and aligns with the evolving nature of professional practice. Collaborative work environments prize critical thinkers, problem-solving team players, builders and leaders with excellent communication skills. Recognizing that the practice of architecture is now global, we provide students with international perspectives and experiences giving them a competitive edge when they enter the profession.

Students whose undergraduate degree was not a design degree will take about 3 ½ years to complete; those who have an undergraduate design degree will likely receive credit for courses previously taken and can complete typically in about two years. The program provides the skills and bodies of knowledge nationally specified for graduate study in architecture and is fully accredited by the National Architectural Accrediting Board (NAAB).

Prerequisites

Students must complete the prerequisites of college-level trigonometry and physics before enrolling in the MArch program or must complete ARCH 5000 Math and Physics for Architects. This course is offered in the summer on a pass/fail basis and meets the prerequisite requirements. This class does not count toward the number of credits required for the M.Arch.degree.

Architecture skills workshop is recommended for students who do not have a background in architectural drawing, model making or digital graphics work. This class is offered each year before the beginning of the fall semester.

Students are also expected to have achieved a basic level of computer literacy and should be familiar with PC or Mac operating systems.

Program Tracks

There are two curriculum tracks leading to the MArch degree, depending on the student's background.

Six Studio Track - 105 Semester Hours

This course of study allows students without a pre-professional degree to pursue a professional Master of Architecture degree in a minimum of three years. The curriculum follows a prescribed course of fundamental core courses and six design studios. Applicants must hold a baccalaureate degree from an accredited university in any field.

Four Studio Track - 60 Semester Hours

This course of study allows students with a pre-professional degree to pursue a professional Master of Architecture degree in a minimum of two years. The curriculum follows a prescribed sequence of core courses and four design studios. Applicants must hold a Bachelor of Science in Architecture, Bachelor of Art in Architecture or Bachelor of Environmental Design in Architecture to be considered for this path. All degrees awarded by universities outside the United States will be reviewed on a case-by-case basis and the admissions committee will determine the appropriate track.

Six Studio Track

Curriculum Overview

The curriculum for the Master of Architecture (M.Arch.) program is divided into six major areas of study, totaling 105 semester hours:

• Design Studios and Seminar	39 semester hours
• Representational Studies including required elective	6 semester hours
• Historical/Cultural Studies including required elective	12 semester hours
• Technological studies including required elective	21 semester hours
• Professional studies	12 semester hours
• Open Electives	15 semester hours

A wide array of electives in these areas allows students to tailor their graduate studies to their own interests. Of the 15 general elective semester hours, nine must be fulfilled with courses taken in the Architecture Department. Advanced standing in core course work can be given for prior architectural studies. Students may choose to take elective courses in the summer session. It is highly suggested that students use the summers to study abroad or participate in a professional internship.

Course Sequence

This schedule shows the recommended sequence of courses. To modify this schedule, students should consult their CAP academic advisor.

First Year

Fall

- ARCH 5110 - Design Studio I
- ARCH 5210 - Introduction to Architecture
- ARCH 5350 - Structures I
- ARCH 5510 - Architectural Graphics
- Professional Studies or Elective Requirement

Total: 18 Hours

Spring

- ARCH 5120 - Design Studio II
- ARCH 5220 - History and Theory Architecture I
- ARCH 5360 - Structures II
- Professional Studies or Elective Requirement
- Professional Studies or Elective Requirement

Total: 18 Hours

Second Year

Fall

- ARCH 5130 - Design Studio III
- ARCH 5230 - History and Theory Architecture II
- ARCH 5310 - Building Construction I
- Professional Studies or Elective Requirement
- Professional Studies or Elective Requirement

Total: 18 Hours

Spring

- ARCH 5140 - Design Studio IV
- ARCH 5330 - Sustainable Systems I
- Professional Studies or Elective Requirement
- Professional Studies or Elective Requirement

Total: 18 Hours

Third Year

Fall

- ARCH 5340 - Sustainable Systems II
- ARCH 6150 - Design Studio V
- Professional Studies or Elective Requirement
- Professional Studies or Elective Requirement
- Professional Studies or Elective Requirement

Total: 18 Hours

Spring

- ARCH 6170 - Design Studio VI
- ARCH 6171 - Integration Seminar
- Professional Studies or Elective Requirement
- Professional Studies or Elective Requirement

Total: 15 Hours

Four Studio Track

Curriculum Overview

The Four Studio Track curriculum for the Master of Architecture (M.Arch.) program is divided into six major components, totaling 60 semester hours in residence at University of Colorado Denver:

• Design Studios and Seminar	27 semester hours
• Representational Studies required elective	3 semester hours
• Historical/Cultural Studies required elective	3 semester hours
• Technological studies required elective	3 semester hours
• Professional studies	9 semester hours
• Open Electives	15 semester hours

A wide array of electives in these areas allows students to tailor their graduate studies to their own interests. Of 15 general elective semester hours, nine must be fulfilled with courses taken in the Architecture Department. Students may choose to take elective courses in the summer session. It is highly suggested that students use the summers to study abroad or participate in a professional internship.

In order for a student to complete the course of study within the 60 semester hours (two years of study) a student must have completed the following courses with a grade of B or better:

- 4 design studios (five or six credits each)
- 2-3 course sequence covering the history of architecture
- 1 course introduction to the theory of architecture
- 2 course sequence on sustainable environmental control systems
- 2 course sequence on structures addressing statics, material mechanics, structural analysis, and design of simple structural elements and systems
- 2 course sequence on building materials and construction
- 1 course on architectural visualization and representation
- 1 course on Building Information Modeling

Above courses not completed by the time the student enrolls in the program will be added onto the 60 semester hours and will need to be completed at the University of Colorado Denver prior to graduation. An official review of the student's previous course work will be conducted in the spring following admissions and will be sent to the student upon the receipt of the student's intent to attend.

Course Sequence

This schedule shows the recommended sequence of courses. To modify this schedule, students should consult their CAP academic advisor.

First Year

Fall

- ARCH 5130 - Design Studio III
- ARCH 5430 - Social Context of Design
- Required or Open Elective
- Required or Open Elective

Total: 15 Hours

Spring

- ARCH 5140 - Design Studio IV
- ARCH 5450 - Sustainable Design Practices
- Required or Open Elective
- Required or Open Elective

Total: 15 Hours

Summer (optional)

Second Year

Fall

- ARCH 6150 - Design Studio V
- ARCH 5410 - Professional Practice
- Required or Open Elective
- Required or Open Elective

Total: 15 Hours

Spring

- ARCH 6170 - Design Studio VI
- ARCH 6171 - Integration Seminar
- Required or Open Elective
- Required or Open Elective

Total: 15 Hours

Summer (optional)

Bioengineering MS

- Graduate School Rules apply to this program.

Master of Science (MS) Degree Program

The master of science degree is offered to students with an undergraduate degree in the life sciences or engineering. Students complete the degree in one to two years with the choice of a project or thesis, either of which may be completed in academia or industry. Program details are available on the Department of Bioengineering website at ucdenver.edu/bioengineering.

Biology MS

- Graduate School Rules apply to this program.

Graduate MS Program Director: Michael Wunder

Office: Science, 4124

Telephone: 303-556-8870

E-mail: michael.wunder@ucdenver.edu

Website: clas.ucdenver.edu/biology/grad.html

Requirements for Admission

- A BA/BS from an accredited institution awarded within the last 10 years (validation of current content may be required)
- Minimum undergraduate GPA: 3.0 ^[L]_{SEP}

- General GRE test: minimum 50% performance in each section (quantitative, verbal, and analytical writing)
- TOEFL: required for international applicants from countries in which English is not the official language [SEP]
- 3 letters of recommendation [SEP]
- Official transcripts from all attended institutions [SEP]
- Students are required to contact faculty in advance. Prior to application, applicants must have identified and contacted an available Faculty Advisor to ensure availability of a position and appropriate research interests

[SEP] Prerequisite courses required: [SEP]

- One year of general biology (lecture and laboratory) [SEP]
- One year of any combination of chemistry, physics or mathematics [SEP]
- One course in applied or biological statistics (through regression and ANOVA) [SEP]
- Additional prerequisite requirements may be set by individual faculty

Application deadline is January 15 for both domestic U.S. and international students. Application to the master's in biology program is through CU Denver Admissions.

Degree Requirements

Students matriculate into the research-based MS degree program. Under unusual circumstances, students and/or advisors may petition for a student to switch into the coursework-based MS degree program. The research-based MS program requires a minimum of 30 credits, and the coursework-based MS program requires a minimum of 32 credits. A maximum of 12 hours of graduate level courses may be transferred and counted toward the degree in either program. Both programs additionally require the student to meet minimum academic residency requirements, to form an advisory committee and to deliver and orally defend written work before the advisory committee, which constitutes the final exam for both programs as required by the Graduate School.

Research-based MS degree program requires

1. Completing 30 credits including 3-6 thesis (BIOL 6950)
2. Meeting minimum academic residency requirements
3. Forming and meeting regularly with an advisory committee
4. Writing and defending research proposal
5. Writing and defending research thesis (including a publishable paper)

Coursework-based MS degree program requires

1. Approved petition to transfer into coursework-based program
2. Completing a minimum of 32 credits
3. Meeting minimum academic residency requirements
4. Writing and defending publication-quality review paper (before advisory committee)

Required Courses:

- BIOL 6705 - Biological Research Workshop (4 credits total-take in 2 different years)
- BIOL 6655 - Seminar (2 credits total-take in 2 different years)
- BIOL 6764 - Biological Data Analysis (4 credits total-take in 1 year)

Additional minimum requirements for the research-based MS program

- BIOL 6950 - Master's Thesis (1-2 credits in first spring/summer to write proposal and 2-4 credits in final semester to write thesis)

Additional minimum requirements for the coursework-based MS program

- BIOL 5840 - Independent Study: BIOL (3 credits: advisor-guided review paper)

Business Administration -- Health Administration MBA

Program Director: Errol L. Biggs

Telephone: 303-315-8851

E-mail: errol.biggs@ucdenver.edu

The graduate program in health administration is consistently ranked as a top program in the United States and attracts students with a variety of backgrounds and experience levels, which further enriches the classroom experience. The HA program is accredited by the Commission on Accreditation of Healthcare Management Education. Full-time faculty with distinguished research records and a select group of practicing managers provide students with the latest thinking on the most important health issues.

Degree Requirements

The curriculum of the MBA with an emphasis in Health Administration is a synthesis of management concepts and techniques that are applicable to any economic organization, and tools that can be specifically applied to health services systems. The program emphasizes skills that strengthen basic analytic and decision-making processes used by top level managers in selecting broad strategies and by junior managers in administering sub-units in healthcare organizations.

Students enrolled in the Master of Business Administration with an emphasis in Health Administration must complete a minimum of 48 semester hours of graduate-level course work to receive their degree. The curriculum is based on a series of structured learning sequences. Most of the courses are available in the evening to enable working students to pursue the degree on a part-time basis. The specific course requirements are as follows:

MBA Core: (27 hours)

- BUSN 6521 - Leading Individuals and Teams
- BUSN 6530 - Data Analysis for Managers
- BUSN 6541 - Legal and Ethical Environment of Business (Health Section)
- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6561 - Marketing Management (Health Section)
- BUSN 6621 - Applied Economics for Managers (Health Section)
- BUSN 6630 - Management of Operations
- BUSN 6640 - Financial Management

- BUSN 6711 - Strategic Management (Health Section) *This course is intended to be taken in your last Spring semester.

Health Administration Core: (12 hours)

- HLTH 6010 - Health Care Systems
- HLTH 6070 - International Health Policy and Management
- HLTH 6770 - Healthcare Quality and Outcomes
- HLTH 6911 - Health Field Studies *This course is intended to be taken in your last Spring semester. Prereq: HLTH 6010 or consent of instructor, minimum 3.0 cumulative GPA.

Health Administration Information Technology Elective: (3 hours)

Select 1 of the following courses:

- HLTH 6071 - Introduction To Health Information Technology
 - HLTH 6072 - Management of Healthcare Information Technology
- The 2nd Health Administration Information Technology Elective may be used as Health Administration Elective.

Health Administration Electives: (6 hours)

Select 2 of the following courses:

- ENTP 6801 - Building Biotechnology
 - ENTP 6848 - Leadership in New Ventures
 - HLTH 6075 - International Health Travel Study
 - HLTH 6740 - Profiles in Health Care
- *HLTH 6071 or HLTH 6072 can be selected if not used as Health Administration Information Technology Elective.

Specialized Tracks in the MBA with an Emphasis in Health Administration

Each track carries its own specific course requirements. To provide a variety of perspectives and experiences within a specific area of health administration, each track includes courses that span various departments within the Business School, other schools at CU Denver, and other University of Colorado campuses.

- International Health Management and Policy Track
- Financial Management Track
- Health Information Technology Management Track

Notes and Restrictions

Administrative Residency. An administrative residency is optional but recommended for students with limited healthcare experience. The program faculty provide assistance to students in securing the residency, as well as regular consultation during the residency period. Information on the full range of local, regional, and national residencies is available from the program director.

Length of program. A maximum of five years and one semester is allowed to complete the Health Administration program.

Business Administration MBA

Program Director: Dawn Gregg

Telephone: 303-315-8000

E-mail: Dawn.Gregg@ucdenver.edu

The Master of Business Administration (MBA) program provides a general background in management and administration. This background enables the student to have the breadth of exposure and depth of knowledge required for an advanced-level management career. The program is devoted to developing the concepts, analytical tools and communication skills required for competent and responsible administration of an enterprise viewed in its entirety, within its social, political and economic environment.

The professional MBA program allows the scheduling of classes with maximum flexibility so students can progress through the program at their own pace, by taking as little as one class per semester or as many as five classes per semester, at times that are convenient with their work schedule. Students may combine on campus courses at our Denver campus or take courses at our South Denver location in Parker, Colorado. For students planning to combine courses at both locations, it is important to work with the advising team for planning purposes. The program can be completed in as little as 16 months or as long as five years plus one semester.

Online courses add additional flexibility. Students may complete all degree requirements online, or combine online and campus courses to broaden the choice of electives or to fit a business travel schedule or personal learning style. Choice of online electives is limited.

The MBA program is also available in different configurations: 11-Month MBA (full time, see relevant section), Health Administration and the Executive MBA (see relevant section). All MBAs have the same curriculum requirements; they differ only in their focus, the flexibility of course scheduling, and the time required to complete the program. The 11-Month and Executive MBAs are lockstep programs (no open electives, no specialized tracks), where students form a cohort and complete all program requirements together. No course transfers, waivers or substitutions are permitted.

Program Requirements

Core Requirements: (30 hours)

- BUSN 6520 - Leading Individuals and Teams
- BUSN 6530 - Data Analysis for Managers
- BUSN 6540 - Legal and Ethical Environment of Business
- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6560 - Marketing Management
- BUSN 6610 - Information Systems Management and Strategy
- BUSN 6620 - Applied Economics for Managers
- BUSN 6630 - Management of Operations
- BUSN 6640 - Financial Management
- BUSN 6710 - Strategic Management

Core Substitution: Students with extensive and comparable course work in a particular core subject area may petition to substitute a higher-level graduate course on the basis of prior undergraduate or graduate course work taken at a regionally accredited college or university for the corresponding core class. This does not waive the 48-hour requirement. If a core course is substituted, another graduate level course in the same functional area must be used as a substitute so that the student completes a total of 48 semester hours.

International Elective: (3 hours)

Any course numbered 6000 or higher with INTB prefix or any graduate level business course that is cross-listed with an INTB prefix. May also include the following: MTAX 6430 International Taxation, ENTP 6826 International Entrepreneurship, ENTP 6827 Global Action Projects for International Entrepreneurship, or RISK 6800 Cyber Risk Management and Cyber Warfare. Travel studies offered by Business School will also apply.

Free Electives: (15 hours)

Any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with prefix of ACCT, BANA, CMDT, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, MTAX, or RISK. Students may also select a MBA Specialization.

Total: 48 Hours

MBA Specializations

Graduate students will have an opportunity to take specialized tracks within the professional MBA program by completing a pre-specified program of elective courses. The following 15 specializations are available:

- Accounting
- Bioinnovation and Entrepreneurship
- Business Analytics
- Business Intelligence
- Business Strategy
- Change Management
- Commodities
- Enterprise Technology Management
- Entrepreneurship
- Finance
- Human Resources Management
- Leadership
- Information Systems
- International Business
- Managing for Sustainability
- Marketing
- Risk Management and Insurance
- Sports and Entertainment Management
- Taxation

Accounting

Acquire specialized knowledge of United States Generally Accepted Accounting Principles (GAAP) and financial reporting standards for publicly traded companies. Analyze the information in corporate annual reports, SEC filings, etc., to gain a better understanding of financial performance and trends.

This specialization includes in-depth knowledge of management accounting techniques for budgeting and management of both service and product oriented businesses. Acquire knowledge of tax compliance requirements and tax planning strategies for normal business operations and for the life-cycle of business start-up, expansion, and reorganizations.

Students should complete required courses and elective courses from the lists below for a total of 4 courses. Your selection of courses is based upon any waivers that have been approved by an advisor. Please contact an advisor for course waiver options.

Required courses:

- ACCT 6030 - Financial Accounting
- ACCT 6070 - Management Accounting
- ACCT 6140 - Tax Planning for Managers

Select one more ACCT 6000 level course or higher as an elective, excluding ACCT 6030, 6070, and 6140.

It is not recommended to repeat any accounting coursework taken in undergraduate studies. Please see an advisor to assess undergraduate transcripts for repeat coursework. Students sitting for the CPA exam should be aware that the CPA will not allow repeat coursework for credit.

Bioinnovation and Entrepreneurship

The Jake Jabs Center for Entrepreneurship is pleased to offer a in Bioinnovation and Entrepreneurship specialization, the first of its kind to be offered by an AACSB accredited graduate business school in the country. Taking advantage of the incredible Colorado biocluster, in collaboration with faculty at Anschutz Medical Campus, this specialization is one-of-a-kind, and is geared to helping bioentrepreneurs achieve commercial success. Additionally, you have opportunities to participate in a number of Jake Jabs Center programs; including the annual business plan competition, internships in area businesses, speaker programs with local entrepreneurs, and connection with new ventures.

Select 1 of the following courses:

- ENTP 6801 - Building Biotechnology
- ENTP 6802 - Regulatory Environment of Life Science Innovation

Select two ENTP courses numbered 6000 or higher, excluding ENTP 6801 or ENTP 6802.

Select 1 of the following courses:

- ENTP 6020 - Business Model Development & Planning
- ENTP 6021 - Corporate Entrepreneurship

Business Analytics

Business analytics merges data, technology, and mathematical models to produce the evidence-based information needed for today's business and government decision-makers.

This specialization in business analytics trains you to construct and interpret models of big data, forecasting, optimization, and simulation. Analytics touch every aspect of business, driving the way businesses understand not only their own processes, but also the way their customers behave.

Complete four courses for the specialization. Select those four courses from any BANA course 6000 level or higher, excluding BANA 6610 and/or the following course as part of the four.

- MKTG 6050 - Marketing Research

Business Intelligence

Modern business runs on information. Success may depend on the quality of the collection and analysis. Business Intelligence (BI) systems combine operational data with analytical tools to present complex and competitive information to planners and decision makers. This improves the timeliness and quality of inputs to the decision process.

Select 4 of the following courses:

- ISMG 6080 - Database Management Systems
- ISMG 6220 - Business Intelligence Systems and Analytics
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6470 - Text Data Analytics and Predictive Modeling
- ISMG 6480 - Data Warehouse and Administration
- ISMG 6810 - Business Intelligence in Healthcare
- ISMG 6820 - Business Intelligence and Financial Modeling

Business Strategy

Business Strategy examines the development of firm strategic plans and implementation including careful resource allocation and leadership skills essential for organizations to effectively meet their objectives. With this specialization, you get the necessary skills and knowledge used to develop and implement business strategy.

Select 4 of the following courses:

- ENTP 6021 - Corporate Entrepreneurship
 - ENTP 6826 - International Entrepreneurship
- OR**
- INTB 6200 - International Business Policy
 - INTB 6022 - International Business Negotiations

OR

- INTB 6500 - International Business Consulting
- MGMT 6320 - Leading Organizational Change
- MGMT 6360 - Designing Effective Organizations
- MGMT 6610 - Business Strategy Lab
- MGMT 6730 - Human Resources Management: Performance Management
- MGMT 6803 - Visionary Leadership
- MKTG 6010 - Marketing Strategy, Evaluation and Development

May select up to 2 of the following FNCE or RISK courses:

- FNCE 6310 - Financial Decisions and Policies
- FNCE 6340 - Business Firm Valuation
- FNCE 6410 - Real Options and Decisions Under Uncertainty
- FNCE 6411 - International Corporate Governance
- FNCE 6420 - Mergers and Acquisitions
- FNCE 6480 - Financial Modeling
- RISK 6909 - Corporate Risk Management

Change Management

Change is inevitable. Even when it is advantageous it can be difficult for organizations and people. Add the Change Management specialization to your degree and gain the necessary tools to help an organization understand the stages and benefits of change.

Required courses:

- MGMT 6320 - Leading Organizational Change
- MGMT 6360 - Designing Effective Organizations

Select 2 of the following courses:

- MGMT 6380 - Managing People for Competitive Advantage
- MGMT 6730 - Human Resources Management: Performance Management
- MGMT 6803 - Visionary Leadership
- MGMT 6804 - Bargaining and Negotiation
- MGMT 6808 - Leadership Development

Commodities

The specialization is a new offering from the J.P. Morgan Center for Commodities. MBA candidates and business professionals should take this specialization for a better understanding of the commodities market in its entirety, from both the physical and financial perspective, including trading operations, investment management, commodities and investment banking. With strong industry support, courses in this specialization are catered to and designed around actual business problems in the commodities sector. Students will have an edge in competing for jobs in the commodity rich sectors of this state.

Complete the following 4 courses:

- CMDT 6582 - Commodity Supply Chain Management
- CMDT 6682 - Trading in Commodity and Financial Markets
- CMDT 6802 - Foundations of Commodities
- FNCE 6382 - Survey of Financial Derivatives

Enterprise Technology Management

Gain a better understanding of business driven technology management. Add the Enterprise Technology Management specialization to your degree and focus on Information Technology as a prime driver and enabler of business strategy. To specialize in ETM you do not have to have a background in business programming however you should take Information Systems Management (BUSN6610) from the core MBA prior to taking the courses in this specialization.

Select 4 of the following courses:

- ISMG 6040 - Business Process Management
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management
- ISMG 6460 - Emerging Technologies
- ISMG 6830 - IT Governance and Service Management

Entrepreneurship

The Entrepreneurship specialization provides a range of focused courses geared towards individuals looking to start their own business. Courses are taught at the Jake Jabs Center for Entrepreneurship located in the heart of downtown Denver or at the new South Denver location at I25 and Lincoln. Complete four entrepreneurship courses to receive a specialization in Entrepreneurship. Additionally, you have opportunities to participate in a number of Jake Jabs Center programs; including the annual business plan competition, internships in area businesses, speaker programs with local entrepreneurs, and connection with new ventures.

Complete four courses total.

Complete 3 courses with an ENTP 6000 or higher number, excluding ENTP 6801 and ENTP 6802.

Then select one of the following capstone courses:

- ENTP 6020 - Business Model Development & Planning
- ENTP 6021 - Corporate Entrepreneurship

Finance

Adding the finance specialization to your degree gives you skills in different financial functional areas including corporate, investments, and financial institutions. You get the tools and skill sets you need for finance decision making and investment.

Required course:

- FNCE 6330 - Investment Management Analysis

Select 3 FNCE or CMDT or RISK 600 level or higher courses.

Human Resources Management

A company is a group of people working toward a common goal. Add the Human Resources Management specialization to your degree, and get advanced knowledge and tools and techniques you can use in recruiting, hiring, developing, motivating and rewarding managerial and non-managerial employees. Also learn about technology solutions such as designing and delivering online training and performance management programs.

Complete the following required course:

- MGMT 6380 - Managing People for Competitive Advantage

Select 3 of the following courses:

- MGMT 6040 - Managing Global Talent

OR

- INTB 6040 - Managing Global Talent
- MGMT 6710 - Human Resources Management: Staffing
- MGMT 6720 - Human Resources Management: Training
- MGMT 6730 - Human Resources Management: Performance Management
- MGMT 6740 - Human Resources Management: Compensation
- MGMT 6750 - HRM: Investing in People: HR Analytics
- MGMT 6760 - Employee Benefits and Workforce Risk Management

Or the following RISK course:

- RISK 6409 - Employee Benefits and Workforce Risk Management
- MGMT 6808 - Leadership Development

Information Systems

You want to be sure you are learning skills relevant to business now. Information systems have become ubiquitous. Managers now understand the need for IS and the benefits that provide an edge on the competition. Information systems impact accounting, financing, marketing, management; in fact every area of business has been changed by technology.

Select 4 of the following courses:

- ISMG 6040 - Business Process Management
- ISMG 6060 - Analysis, Modeling and Design
- ISMG 6080 - Database Management Systems
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6450 - IT Project Management

International Business

International Business is quickly becoming simply business. Adding a specialization in International Business to your degree will help you to work internationally, and with international companies. From cross cultural management to legal aspects to marketing internationally. Prepare yourself for how business works today.

Required course:

- INTB 6000 - Introduction to International Business

OR

- ENTP 6826 - International Entrepreneurship

Complete 3 of the following courses:

Any INTB 6*** course excluding INTB 6000 and INTB 6200. May include the following courses that are not INTB: ENTP 6827 (Global Action Projects for International Entrepreneurship); MGMT 6834 (London Calling: Global Sports and Entertainment-Travel Study); MTAX 6430 (International Taxation); RISK 6800 (Special Topics in Risk Management and Insurance).

Leadership

Become a more effective leader with this specialization as you concentrate on developing key leadership skills and learn about areas where leadership matters most.

Complete a total of 4 courses for the specialization.

Required courses.

Complete 2 or 3 of the following courses:

- MGMT 6803 - Visionary Leadership
- MGMT 6804 - Bargaining and Negotiation
- MGMT 6808 - Leadership Development

Then complete 1 or 2 of the following courses:

- BANA 6650 - Project Management
- ENTP 6848 - Leadership in New Ventures
- INTB 6000 - Introduction to International Business
- MGMT 6821 - Managing for Sustainability
- MGMT 6822 - Business Ethics and Corporate Social Responsibility
- MGMT 6823 - The Sustainable Business Opportunity
- MGMT 6824 - Sustainable Business/CSR Field Study (**prereq: one sustainable business elective**)

Managing for Sustainability

More than ever before, major companies and entrepreneurial ventures are seeking competitive advantage and success by embracing sustainability — social and environmental responsibility — as a core business strategy. Farsighted leaders recognize that this new way of doing business requires skills in sustainable management including social entrepreneurialism, eco-efficiency, inter-disciplinary problem solving and a triple bottom line approach of economics, environment and society. Make your degree a green MBA by adding the Managing for Sustainability specialization and learn what businesses are facing in a world where resources are scarce, social safety nets are declining, and customers and commentators are concerned about a company's investment in corporate responsibility.

Complete 4 of the following courses:

- ACCT 6285 - Accounting and Finance for Sustainability
- BANA 6730 - Supply Chain Management
- ENTP 6642 - Exploring Social Entrepreneurship
- ENTP 6644 - Social Entrepreneurship in the Developing World
- ENTP 6808 - Practicum in Sustainable Business Research
- INTB 6870 - Global Climate Change

OR

- BUSN 6870 - Global Climate Change
- MGMT 6821 - Managing for Sustainability
- MGMT 6822 - Business Ethics and Corporate Social Responsibility
- MGMT 6823 - The Sustainable Business Opportunity
- MGMT 6824 - Sustainable Business/CSR Field Study
- MKTG 6830 - Marketing & Global Sustainability
- MGMT 6840 - Independent Study (**by petition only**)
- MGMT 5939 - Internship (**by petition only**)

OR

- MKTG 5939 - Internship **(by petition only)**

Students may take 1 sustainability course outside the Business School from another CU Denver school/college/department (by petition only).

Marketing

Marketing is about building long-term relationships between your firm and those who buy its offerings. Just how important is marketing to a firm's success? Well without it there would be no way to communicate with current or potential customers and no revenues. That's right, all of a firm's revenues flow through the marketing function and the way a firm communicates with its markets is through its offerings. Given its critical roles in the success of any firm you might want to develop a deeper understanding of the issues it addresses and a more complete toolkit for analyzing its impact. This is what an MBA degree with a Marketing specialization from the University of Colorado Denver is designed to do. Your MBA-based Marketing specialization will give you the skills and confidence needed to effectively manage a firm and in particular those aspects associated with building profitable, long-term, business relationships. Since Marketing is such a broad area that affects many aspects of business we provide you considerable flexibility to select courses that are appropriate for your chosen career. In fact, we recommend that before selecting your marketing electives you speak with one of our marketing professors for additional insights on which courses are better suited to your situation.

To complete the specialization select 4 MKTG 6000 level or higher courses.

Risk Management and Insurance

The specialization in Risk Management and Insurance is designed for students who are interested in pursuing or advancing a career in the insurance industry, or other areas of risk management.

Required courses:

- RISK 6809 - Principles of Risk Management & Insurance
- RISK 6909 - Corporate Risk Management
- RISK 6129 - Practical Enterprise Risk Management

Complete one of the following courses:

- CMDT 6682 - Trading in Commodity and Financial Markets
- FNCE 6330 - Investment Management Analysis
- FNCE 6350 - Financial Innovations
- FNCE 6360 - Management of Financial Institutions
- FNCE 6380 - Futures and Options
- FNCE 6382 - Survey of Financial Derivatives
- FNCE 6410 - Real Options and Decisions Under Uncertainty
- FNCE 6480 - Financial Modeling
- RISK 6309 - Strategic Risk Management

Complete one of the following courses:

- BUSN 6830 - Business and the Natural Environment
- INTB 6870 - Global Climate Change

OR

- BUSN 6870 - Global Climate Change
- BANA 6650 - Project Management
- CMDT 6582 - Commodity Supply Chain Management
- CMDT 6802 - Foundations of Commodities
- ENTP 6824 - Entrepreneurial Financial Management
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management
- MGMT 6823 - The Sustainable Business Opportunity
- RISK 6409 - Employee Benefits and Workforce Risk Management
- RISK 6509 - Global Risk Management
- RISK 6800 - Special Topics: Cyber Risk Management & Cyber Warfare

Sports and Entertainment Management

The Sports industry is the sixth largest industry in the United States and the Sports and Entertainment industries are converging. To become a professional in these industries, you need special skills. Through this specialization, you gain the tools to get ahead in both the sports management and entertainment management industries.

Complete 4 of the following courses:

- BUSN 6860 - Finance in the Sports Entertainment Industries
- MGMT 6830 - Sports and Entertainment Management
- MGMT 6832 - Law and Negotiation in the Sports/ Entertainment Industries
- MGMT 5939 - Internship **(in Sports and Entertainment field; by petition only)**
- MGMT 6834 - London Calling: Global Sports and Entertainment Management **(Travel Study)**
- MKTG 6820 - Sports & Entertainment Marketing

Taxation

Gain an insight into one of the most important cost factors affecting entrepreneurs and businesses of all sizes - taxes.

Understand the fundamentals of federal income taxation and the role that taxes play in a business person's strategic investment and business decisions. Acquire knowledge of the various tax ramifications that influence way business ventures and enterprises are structured, organized, operated and eventually liquidated.

Students should complete required and elective courses from the lists below for a total of 4 courses. Your selection will be based upon any waivers that have been approved by an advisor.

Complete the following required courses:

- ACCT 6140 - Tax Planning for Managers
Please contact a graduate advisor for course waiver options for ACCT 6140.
- MTAX 6450 - Research Problems In Taxation
- MTAX 6400 - Taxation of Corporations and Shareholders

Elective courses to select from:

- MTAX 6430 - International Taxation
- MTAX 6440 - Tax Practice and Procedures
- MTAX 6475 - Accounting for Income Taxes
- MTAX 6480 - Partnership Taxation

Business Administration: 11-Month MBA

Program Director: Gary Colbert

Operations Director: Debbie Capaldi Follenweider

E-mail: 11-monthMBA@ucdenver.edu

Telephone: 303-315-8800

Website: www.business.ucdenver.edu/11-MonthMBA

The 11-Month MBA is an accelerated full-time program that brings academically superior students together with select research and teaching faculty. The program enables students to focus their energies in a concentrated, total-immersion program of study earning a nationally accredited, 48-semester-hour MBA degree in just under a year.

The 11-Month MBA consists of five eight-week terms, three courses per term, plus a two-week international business course abroad. In addition to a minimum of 18 hours of class time each week, the 11-Month MBA students spend an average of 30 hours a week on homework. Students should expect a minimum time commitment of 48 hours per week to successfully complete this program.

Admission and Application Process

The admissions committee considers each candidate's entire record of achievement demonstrated through academic transcripts, GMAT scores, essays, letters of recommendation, personal interviews (if needed, will be scheduled at the discretion of the admission committee), work experience and extracurricular and community activities.

Previous Education

Applicants' complete academic records, including GPAs and previous course work are considered. Undergraduate degrees do not have to be in business, but they must be from regionally accredited colleges or universities.

Testing

The GMAT is a requirement for application to the 11-Month MBA Program. If you take the GMAT more than once, we will evaluate your application using the highest GMAT score. The GMAT score for students admitted into the 11-Month MBA Program has averaged around 600. Students must score a minimum 500 to be considered for admission to the 11-Month MBA Program. The GMAT website is www.mba.com.

The 11-Month MBA also requires a highly developed proficiency in written and oral English. International applicants whose first language is not English must take the TOEFL or IELTS exam and earn a minimum score of 575 (PBT)/ 232 (CBT)/ 90 (IBT) TOEFL or 6.5 IELTS to be considered for admission to the 11-

Month MBA Program. Information on taking the TOEFL or IELTS can be obtained by visiting www.ets.org and www.ielts.org.

Work Experience

Students in the 11-Month MBA Program have an average of six years of work experience. The admissions committee requires a minimum of two years professional work experience to apply. Professional experience strengthens the application, since it adds relevance and depth to the learning process and enables candidates to contribute to and benefit from the knowledge of fellow classmates in the accelerated time frame of the program.

Applications

The following are required for consideration of admission to the program.

- application fee (domestic or international as appropriate)
- online application for graduate admission
- two (2) letters of recommendation from professional or academic acquaintances who are familiar with the applicant's academic/professional competence
- GMAT scores taken in the last five years sent directly to the graduate admissions office from the Educational Testing Service. When registering for the GMAT, use code MPB-OG-65
- two (2) official transcripts from each school, college or university previously attended past high school, sent directly to the graduate admissions office. A minimum baccalaureate degree is required
- include answers to the four essay questions demonstrating commitment to an accelerated MBA program
- a resumé outlining work experience
- for international students, a minimum official score of 575/232/90 TOEFL (TOEFL school code: 4875) or 6.5 IELTS is required to apply -- test scores are valid for two years after test date

The priority date for domestic applications is June 15 (May 15 for international students). Applications (for domestic students) and current fee information are available at www.business.ucdenver.edu/11-monthMBA.

All of the required admission materials should be sent to:

University of Colorado Denver
The Business School
Graduate Admissions
Campus Box 165, P.O. Box 173364
Denver, CO 80127-3364

For further information, brochures and application materials, contact the 11-Month MBA Program at 303-315-8800 or 11-monthMBA@ucdenver.edu.

The 11-Month MBA uses a rolling admission system. The committee reviews applications when they are complete in all respects, including transcripts, GMAT scores and letters of recommendation. Candidates are encouraged to submit their application as early in the process as possible. Completed applications are reviewed until early August; applications received after June 15 will be reviewed on a space-available

basis. International applicants should have their completed applications in by May 15, to leave them sufficient time for visa and travel arrangements if they are admitted.

A personal interview may also be required for admission to the 11-Month MBA.

11-Month MBA Award/Loans

General financial assistance is available for qualified students. Students should apply directly to the Denver campus Office of Financial Aid. Call 303-556-2886 for information and forms. In addition, an 11-Month MBA merit-based award is available only to students in the 11-Month MBA. Other Business School scholarships are also available to all MBA students. Information available at www.business.ucdenver.edu/11-monthMBA.

Degree Requirements

Students in the 11-Month MBA complete 10 MBA core courses, one international business course (conducted abroad) and five special topics courses. All courses require that students work in teams. Due to the program's cohort structure, individual elective options are not available to 11-Month MBA students. **No courses may be waived, substituted or transferred into the program.** If a student finds it necessary to leave the accelerated program, credits already earned may be transferred to the Professional MBA program on campus.

MBA Core Courses

- BUSN 6520 - Leading Individuals and Teams
- BUSN 6530 - Data Analysis for Managers
- BUSN 6540 - Legal and Ethical Environment of Business
- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6560 - Marketing Management
- BUSN 6610 - Information Systems Management and Strategy
- BUSN 6620 - Applied Economics for Managers
- BUSN 6630 - Management of Operations
- BUSN 6640 - Financial Management
- BUSN 6710 - Strategic Management

Total: 30 Hours

International Course Abroad

The international course, which involves travel abroad, is completed as an all-day, two-week intensive course.

Special Topics Courses

The special topics courses, revised each year, are selected to create a broad understanding of the most current business issues. These requirements are subject to change.

Business Analytics MS

Program Director: Deborah Kellogg

Telephone: 303-315-8435

E-mail: Deborah.Kellogg@ucdenver.edu

The MS in Business Analytics focuses on modeling and applications which prepares you for a career as a business analyst in industry or government. Today, companies in every conceivable industry are reaping the benefits of using formal mathematical models to assist them in addressing complex business problems. Business Analytics graduates hold positions that bridge the gap between operations research/statistics specialists and management.

Learn to apply quantitative methods to real-world problems using modern methodologies adopted from statistics, operations research, and management science. The MS in Business Analytics focuses on applications of mathematical models in the workplace rather than the development of new research techniques. The managerial emphasis of our degree is accomplished through a comprehensive set of elective and required coursework such as data analysis, operations management, forecasting, project management, simulation, predictive analytics, and supply chain management. Students may elect to pursue a specialization in Big Data.

This degree is not designed to be completed in one year. Requirements for the MS degree in Business Analytics are met by the following courses and options:

Core Required Courses: (21 hours)

- BUSN 6630 - Management of Operations
- BANA 6610 - Statistics for Business Analytics
- BANA 6620 - Computing for Business Analytics
- BANA 6630 - Business Forecasting
- BANA 6640 - Decision Analysis
- BANA 6650 - Project Management
- BANA 6660 - Predictive Modeling with Big Data

Electives: (9 hours)

Select any three courses which must include BANA courses numbered 6000 or higher or MKTG 6050 Marketing Research.

Students may customize the degree by selecting BANA electives meeting the above description OR students may utilize BANA electives to complete the Big Data Specialization (BDA) outlined below:

Big Data Specialization

The following BANA core required courses must be completed for this specialization:

- BANA 6620 - Computing for Business Analytics
- BANA 6660 - Predictive Modeling with Big Data

Select one of the following courses:

- BANA 6800 - Special Topics
Special topics course will only count as part of this specialization if the special topic includes Big Data.
- BANA 6910 - Business Analytics Practicum
BANA 6910 will only count as part of this specialization if the topic includes Big Data.

Notes and Restrictions

Students are not required to take a comprehensive examination or complete a thesis in the major field.

Note: Business School MS degrees typically allow students to transfer in 9 semester hours from another university. However, the MS in Business Analytics (BANA) allows students to petition to have a maximum of 6 semester hours transfer from another university. The transfer of *required* courses must closely reflect the educational objectives of the Master's degree in Business Analytics. The evaluation of substitute courses will include syllabi evaluation and the accreditation of the transferring institution.

Total: 30 Hours

Chemistry MS

- Graduate School Rules apply to this program

Program Director: Scott Reed

Email: Scott.Reed@ucdenver.edu

Office: SI 4131

Phone: 303-556-6260

Requirements for Admission

Students must meet the Downtown Campus Graduate School admission requirements with specific chemistry requirements as follows:

- Undergraduate GPA of at least 3.0.
- Undergraduate major in chemistry essentially equivalent to the one offered at CU Denver (see the undergraduate requirements), including two semesters of organic, analytical and physical chemistry with laboratories and one semester of inorganic chemistry. No student will be admitted to the graduate program who is not within two classes of meeting the undergraduate requirements.
- GRE examination is recommended, as is the advanced chemistry GRE examination.
- International students have additional admission requirements concerning immigration status, proof of financial responsibility and acceptable TOEFL scores.
- Applicants who fail to meet the full admission standards may be offered provisional admission.

Prospective students are encouraged to contact the graduate program director or visit the chemistry department website for additional details concerning the chemistry program, admission procedures, financial assistance and faculty research interests.

General Program Requirements

At the heart of the graduate program is a set of four core graduate courses in the fields of analytical, inorganic, organic and physical chemistry. A student must qualify in order to register for any core graduate class, either by passing a qualifying examination in that field or by passing the equivalent undergraduate class in that area at CU Denver with a grade of *B* (3.0) or better. The qualifying examinations are administered each fall and spring usually during the week before classes begin. They are required for all entering students. The purpose of these examinations is to evaluate a student's background in the basic areas of chemistry. The examinations are American Chemical Society standardized tests in the four core areas. All entering students are required to qualify in all four core fields during their first year in the graduate program. Individual core classes may have additional prerequisites.

Depending on the program option that she/he selects, a student will be required to pass either three (Plan I) or all four (Plan II) of the graduate core courses with no grade in a core course below *B-* (2.7).

The remaining course work for the degree will consist of regular graduate offerings in chemistry, a limited number of which may be substituted by approved classes in related fields. In particular, students interested in interdisciplinary areas, such as biochemistry or environmental chemistry, are encouraged to take cognate courses outside the chemistry department. The chemistry graduate program director must approve in advance any graduate class taken outside the department that is to count toward the degree. All students are required to annually submit an updated program plan for approval and to have their progress evaluated by the graduate program director.

Specific Degree Requirements

There are two options for obtaining a master's degree from the Department of Chemistry: Plan I, the thesis option, and Plan II, the course work emphasis option. All students must complete at least 3 semester hours of master's report (CHEM 6960). A student is allowed to participate in the thesis option only after the successful completion of the master's report with the proposed advisor, and upon the mutual agreement of both the student and advisor that the student is prepared to work on a master's thesis. Students who select the course work emphasis option may petition to have up to 3 additional semester hours of master's report research substitute for an equivalent number of course work hours.

Plan I. Thesis Option

Plan I is a research-oriented program involving a minimum of 30 semester hours with the following requirements:

- 21-23 semester hours of formal course work, including three of the four graduate core courses
- 4-6 semester hours of CHEM 6950, Master's Thesis research; successful completion of the thesis research includes the presentation of the results at a departmental seminar
- 3 semester hours of CHEM 6960, Master's Report research
- a grade of *B-* (2.7) or better in all courses completed; *B-* (2.7) or better in all core courses
- a cumulative GPA of 3.0 or better in all courses taken as a graduate student
- an acceptable formal thesis consistent with the guidelines of the Graduate School
- successful oral defense of the master's thesis before a committee of at least three graduate faculty members, two of whom must be tenure track faculty members in the chemistry department
- compliance with all Graduate School Rules
- all work must be completed within five years of completion of the first graduate class in the department

Plan I thesis research must be conducted under the direct supervision of a tenure-track faculty member of the Downtown Campus Department of Chemistry. Plan I students must take a minimum of 15 semester hours of formal course work in chemistry at the 5000 level or above. Students may petition the graduate program director in advance for permission to take one or two courses at the graduate level outside of chemistry that would count toward the requirements for an MS in chemistry.

Plan II. Course Work Emphasis Option

Plan II is a course work-oriented program involving a minimum of 33 semester hours with the following requirements:

- 27-30 semester hours of formal course work, including all four graduate core courses
- at least 3 (but not more than 6) semester hours of CHEM 6960, Master's Report, research
- a grade of B- (2.7 or better in all courses completed; B- (2.7) or better in all core courses
- a cumulative GPA of 3.0 or better in all courses taken as a graduate student
- a final research report
- presentation of the research project in a final seminar
- successful defense of the project before a committee of at least three graduate faculty members, one of whom must be a tenure-track faculty member in the chemistry department
- compliance with all Graduate School Rules
- all work must be completed within five years of completion of the first graduate class in the department

A Plan II student may petition the graduate program director to substitute up to 3 semester hours of master's report (CHEM 6960) research, beyond the required minimum, for an equivalent number of semester hours of formal course work. Approval will be perfunctory for research performed with the support and under the direct supervision of a faculty member in the Department of Chemistry. Plan II students must take a minimum of 24 semester hours of formal course work in chemistry at the 5000 level or above. Students may petition the graduate program director in advance for permission to take up to two courses at the graduate level outside of chemistry that would count toward the requirements for an MS in chemistry.

Civil Engineering MS and MEng

- Graduate School Rules apply to these programs

Graduate Degree Programs

The civil engineering graduate program is designed for both full-time and part-time students who want to advance their academic and professional skills in civil engineering and related areas. Many students are full time, while many also work full-time jobs and complete evening classes. Depending on a student's pace, the master's program takes 2-4 years to complete (on average). All graduate courses are offered in the afternoons, evenings or on Saturdays. Some courses, including all GIS classes, are offered online.

Specialty Areas:

Master of Science (MS)

- Environmental and Sustainability Engineering
- Geographic Information Systems (GIS)
- Geotechnical Engineering

- Hydrologic and Hydraulic Engineering
- Structural Engineering
- Transportation Engineering

Master of Engineering (MEng)

- Construction Engineering and Management
- Geomatics Engineering and Geographic Information Systems (GIS)
- Sustainable Infrastructure
- Transportation Systems

Degree Requirements

Two MS degree programs are available.

Plan I - Master's Thesis: This plan requires 24 semester hours of graduate-level course work and 6 semester hours of master's thesis credit.

Plan II - Master's Report: This plan requires 27 semester hours of graduate-level course work and 3 semester hours master's report credits.

Master of engineering students must follow Plan 2 above. Additionally, of those 30 semester hours, at least 15 hours must be completed with CE classes, including the master's report. The remaining hours may be completed in related disciplines that supplement the chosen area of study. Both the MS and MEng degrees require satisfactory completion of a written comprehensive exam and an oral defense of the master's thesis or master's report to a committee of at least three graduate faculty. Every graduate student must also satisfy the degree requirements of the Graduate School on the Denver campus, specified in the Information for Graduate Students chapter of this catalog. Both the MS and the MEng degree programs must be completed within seven years of the date the student begins the degree program.

Courses for both the MS and MEng degree programs are selected by mutual agreement of the student and his/her faculty advisor after admission to the degree program. The advisor may also specify undergraduate courses that must be completed before starting graduate course work, but these will not count toward the semester hour requirements for the degree. The student's thesis or report topic must also be approved by the faculty advisor.

Requirements for Admission

GPA and GRE Scores:

Applicants must submit evidence of adequate preparation for graduate study by either (a) submitting official GRE scores, or (b) documenting an earned bachelor's degree with a GPA of 3.00 or higher from an institution accredited by a U.S. accreditation body, or an earned master's degree with a GPA of 3.50 or higher from an institution accredited by a U.S. accreditation body.

Transfer Credit:

Master's students may transfer up to 9 semester hours from another institution toward their master's degree, if approved by their advisor.

Program Prerequisites:

Prerequisite classes are in addition to the 30 semester hours needed to complete a master's degree, as they are necessary background information that is usually included in an engineering bachelor's program. Students must receive a grade of C-minus or better for the prerequisite class to apply to the program.

Students may complete prerequisite classes either before or after being admitted to a degree program. However, applicants with too many prerequisites may not gain admission. For applicants completing prerequisites after admission, all prerequisite courses must be completed before 12 of the 30 master's semester hours are complete.

If prerequisites are taken while admitted to the master's program, students must maintain a 3.0 overall GPA, per Graduate School rules.

Requests for applications for graduate study in civil engineering should be addressed to

CU Denver Department of Civil Engineering
Campus Box 113
P.O. Box 173364
Denver, CO 80217-3364

Applicants who are not citizens or permanent residents of the United States must apply through the Office of International Admissions, Campus Box 185, P.O. Box 173364, Denver, CO 80217-3364. All applicants for admission must submit complete credentials as outlined in the instructions that accompany the application materials. Learn more in the International Students section of the catalog.

Communication MA

► Graduate School Rules apply to this program

Our vibrant community of scholars and teachers is committed to providing a real world, hands-on, and theoretically robust master's degree that will enrich your communication knowledge and skills for the twenty-first century. Our program is a 33-credit generalist degree designed to enhance students' intellectual and professional growth through the understanding and practice of effective communication. Our faculty members are nationally and internationally recognized leaders in their field, and our students hail from all over the world.

Students who complete our program often receive offers to top-notch PhD programs or accept or continue in positions related to communication management, strategic communication, public relations, media relations, human relations, and corporate and non-profit communications.

Degree Requirements

The MA degree in communication requires the completion of 33 hours of graduate course work (5000 level or above). As explained below, students have the option of taking 6 hours of 4000-level courses outside of Communication. In this situation, a student will take 27 hours of graduate credit and 6 hours of 4000-level (undergraduate) course work. The requirements for course work are as follows:

Required Introduction Course

- COMM 6013 - Introduction to Graduate Work in Communication
(recommended to be taken the first semester of graduate course work; offered only in the fall semester)

Total: 3 Hours

Methods Course

Most methods courses are offered every other year. Students who wish to pursue a PhD may elect to take additional methods classes in or outside the department.

Choose one:

- COMM 5022 - Critical Analysis of Communication
- COMM 5205 - Empirical Research Methods for Communication
- COMM 5221 - Research Methods: Qualitative
- COMM 5700 - Writing Practicum
- COMM 5710 - Topics in Communication

The topics courses that may be used toward the methods requirement are Media Criticism and Film Criticism.

Total: 3 Hours

Graduate Seminars*

In addition to the above core requirements, students must take five graduate seminars from the Department of Communication. Graduate seminars are 5000- or 6000-level courses. Seminars are often topics classes taught in faculty areas of expertise.

- COMM 5240 - Organizational Communication
- COMM 5250 - Difference Matters and Organizational Communication
- COMM 5265 - Gender and Communication
- COMM 5600 - Media Theory
- COMM 5710 - Topics in Communication

Topics include but are not limited to: Media Criticism, Film Criticism, Critical Theory, Communication, Globalization, Social Justice, Communication, Democracy, Civil Engagement, Digital Health Narratives, Organizational Discourse, and Communication and Security.

- COMM 5760 - New Media

*Graduate Seminars are courses that have a minimum enrollment of 15 or fewer graduate students.

Total: 15 Hours

Electives

Students must complete four electives. A minimum of two of these electives must be at the 5000 or 6000 level; the remaining two may be at the 4000 level, provided the 4000 level classes are outside the department. At least two of the four electives must be communication courses; the remaining two electives may be taken from outside of the Department of Communication.

- COMM 5040 - Communication, Prisons, and Social Justice
- COMM 5255 - Negotiations and Bargaining
- COMM 5265 - Gender and Communication
- COMM 5270 - Intercultural Communication
- COMM 5282 - Environmental Communication
- COMM 5710 - Topics in Communication
Topics include but are not limited to: Media Criticism, Film Criticism, Critical Theory, Communication, Globalization, Social Justice, Communication, Democracy, Civil Engagement, Digital Health Narratives, Organizational Discourse and Communication and Security.
- COMM 5500 - Health Communication
- COMM 5550 - Rhetorics of Medicine & Health
- COMM 5620 - Health Risk Communication
- COMM 5621 - Visual Communication
- COMM 5051 - Advanced Strategic Communication
- COMM 5665 - Principles of Advertising
- COMM 5840 - Independent Study
- COMM 5939 - Internship
- COMM 5995 - Travel Study
- COMM 6950 - Master's Thesis
You need 3-6 thesis credits if you elect the thesis option.

Total: 12 Hours

Thesis

Students wishing to complete a thesis must register for between 3-6 semester hours of thesis work, and will need 33 credits to graduate. Credit for a thesis may substitute for one or two elective course requirements.

Total: 3-6 Hours

Students must receive a grade of *B* or higher in all courses that are applied to the MA degree.

All students must pass a comprehensive examination at the end of course work.

Students must comply with all rules of the CU Denver Graduate School.

Degree Total: 33 Hours

Computer Science MS

► Graduate School Rules apply to this program

The Department of Computer Science and Engineering requires master's degree candidates to complete a program of study consisting of at least 30 semester hours of graduate level computer science courses while maintaining a grade point average of at least 3.0. According to the Graduate School Rules, graduate courses with grades below B- cannot be applied toward the completion of the graduate degree. With prior approval by the Graduate Committee a student may substitute up to nine semester hours with graduate mathematics or other engineering courses.

Students need to submit an approved Plan of Study to the department during the first semester of their admission. An academic advisor will consult with students to develop a Plan of Study. Students may choose **Plan I** (Thesis), **Plan II** (MS Project), or **Plan III** (Course Only). Both Plan I and II require successful defense of thesis or project in student's graduating semester.

- **Plan I-Thesis:** Students take 24 hours of graduate course work, and additionally write and defend a thesis, which counts for 6 hours of graduate thesis work.
- **Plan II-MS Project:** Students take 27 hours of graduate course work, and additionally write and defend a MS project report, which counts for 3 hours of graduate MS project work.
- **Plan III-Course Only:** Students must take 27 hours of graduate course work, and additionally take the MSCS capstone course (CSCI 6970), which counts for 3 credit hours. Independent study courses will not be counted toward graduation in this course only option.

Students are allowed a maximum of 3 credit hours of CS Independent Study (except in Plan III, course-only option).

Students may only take graduate engineering or graduate mathematics courses that are offered toward an MS degree in a degree-granting department, while at least 21 hours must be CS. It is advisable that students get prior approval of a graduate CS advisor before taking any course that does not have a CSCI prefix. For example, courses offered through Continuing Education are not counted toward an MS degree in Computer Science.

The only exception for a student to take a graduate course from any other department is when the course satisfies all of the following conditions:

1. It appears in a graduate program.
2. It is taken instead of 3 hours of CS Independent Study.
3. It is approved by the CS Graduate Committee.

No more than 6 credit hours may be in the form of online courses.

Adequate Progress toward MS in Computer Science Degree

Students are expected to finish the MS degree program within five years. Candidates for the MS degree may not get credit for a course taken longer than five years before the date on which the degree is to be granted.

Students who do not enroll for any course work relevant to computer science in a given semester (summer semesters excluded) must supply the Department of Computer Science and Engineering with a written statement describing the reason for the inactivity. Students who are inactive for three consecutive semesters (summer semesters excluded) will be removed from the program, and must re-apply for admission.

Students may choose either Plan I (thesis) or Plan II (MS project) or Plan III (course only option).

For up-to-date information, please refer to the current graduate handbook from the CSE department website at engineering.ucdenver.edu/cse > Degree Programs.

Counseling MA

Return to: School of Education & Human Development

- Degree

- Admission Requirements
- Program Requirements

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Website: www.ucdenver.edu/counseling

Faculty

Information about faculty in the Counseling program is available online at www.ucdenver.edu/education.

Degree

The Master of Arts degree in Counseling program prepares professionals for community/mental health agencies, private practice, public schools, and institutions of higher education. Students should obtain faculty advising regarding professional requirements. Students accepted into the Counseling program follow one of the five concentration areas. The clinical mental health and clinical mental health-multicultural counseling tracks follow state licensure requirements for licensed professional counselor; the couple and family therapy track follows licensure requirements designated by the state of Colorado of licensure as a marriage and family therapist and state licensure requirements for licensed professional counselor; the school track follows both the licensed professional counselor licensure and Colorado Department of Education license as a school counselor requirements; and the higher education and student affairs track follows the Counsel for the Advancement of Standards in Higher Education standards but does not lead to any counseling license.

The clinical mental health, couple and family therapy, and school counselor tracks consist of 63 semester hours. The clinical mental health-multicultural track consists of 66 semester hours. Core requirements that are common to all areas of study are followed by courses specific to each program. The clinical mental health and clinical mental health-multicultural, couple and family therapy, and school counselor tracks require a practicum (150 clock hours) and an internship (600 clock hours). For students in these tracks, the master's degree is a three-year program with course work for two years followed by a year of practicum and internship.

The higher education and student affairs track consists of 45 semester hours. Students in this track are required to complete a 600 hour internship.

The clinical mental health and clinical mental health-multicultural, couple and family therapy, and school counselor tracks are nationally accredited by CACREP, the Council for the Accreditation of Counseling and Related Educational Programs.

Admission Requirements

Successful applicants to the Counseling program will have obtained a minimum 2.75 undergraduate GPA and will score at least 290 (combined) on the verbal and quantitative sections of the Graduate Record Exam (GRE) or at least 396 on the Miller Analogry Test (MAT). Also, applicants will submit a current resume, a letter of intent, three letters of recommendation and additional required materials. Applicants meeting

these minimum standards may be invited to a half-day group interview that involves program orientation, small group interviews, a writing assignment and a group exercise.

A prerequisite course in basic statistics (undergraduate or graduate level) is required prior to enrollment in the program or may be completed during the first semester in the program.

Application materials are available at

https://soa.prod.cu.edu/degreeprog/applyDEGREEPROG_CUDEN/login.action. All materials must be submitted online by the appropriate deadline: September 15 for spring semester; January 15 for summer and fall semesters.

Program Requirements

Counseling students must earn at least a B in skills-oriented courses (COUN 5100, 5160, 6140, 7100, 5910, 5930) or must repeat these courses until they do so. Students in clinical mental health and clinical mental health-multicultural, couple and family therapy, and school counselor tracks must also take a national comprehensive examination (after all core courses). Students in the higher education and student affairs track must complete a comprehensive examination in the last semester of study. Students may choose to conduct research and submit a thesis (research conducted under faculty advisement) instead of taking a comprehensive examination.

Counseling Core

COUN 5010 - Counseling Theories

COUN 5100 - Techniques of Counseling

COUN 5110 - Group Counseling

COUN 5150 - Family Counseling/Therapy*

COUN 5330 - Counseling Issues and Ethics*

COUN 5400 - Career Development

COUN 5810 - Multicultural Counseling Issues for Individuals and Families

EDHD 6200 - Human Development Over the Life Span

RSEM 5110 - Introduction to Measurement

RSEM 5120 - Introduction to Research Methods

National Comprehensive Exam to be taken after the COUN core classes are completed.*

Total: 30 Hours

*not required for students in the higher education and student affairs track

Additional Requirements for Clinical Mental Health Counseling (MA)

COUN 5160 - Techniques in Family Therapy

COUN 5280 - Addictions Counseling

COUN 5820 - Strategies of Agency Counseling

COUN 6250 - Mental Health Diagnosis

COUN 7100 - Advanced Theories and Techniques in Psychotherapy

Two Additional Electives (6 semester hours)

Total: 21 Hours

Additional Requirements for Clinical Mental Health Counseling-Multicultural

COUN 5160 - Techniques in Family Therapy
COUN 5820 - Addictions Counseling
COUN 5820 - Strategies of Agency Counseling
COUN 5830 - Special Topics Gender & Sexual Orientation
COUN 6100 - Spiritual Dimensions of Counseling
COUN 6250 - Mental Health Diagnosis
COUN 6810 - Advanced Multicultural Counseling
COUN 7100 - Advanced Theories and Techniques in Psychotherapy

Total: 24 Hours

Additional Requirements for School Counselor License (MA)*

COUN 5280 - Addictions Counseling
COUN 5425 - Developing & Implementing a School Counseling Program: ASCA
COUN 5815 - Introduction to School Counseling
COUN 5915 - Practicum in School Counseling
COUN 6140 - Counseling Children, Adolescents and Their Parents
COUN 6230 - Developmental Counseling in Schools: Prevention & Intervention
COUN 6250 - Mental Health Diagnosis
PLACE Test is required for the Colorado Department of Education license for school counselors.

Total: 21 Hours

*100 hour practicum is required in the schools (COUN 5915). Three hundred of the 600 hours of internship must be in a concentrated environment. Full time experience consisting of at least a four-hour block of time each day is required. Students may not do their internship in their primary employment (agency or school setting). For school counseling, three hundred (300) hours of internship are needed at the middle and secondary level for a K-12 program. COUN 5150, 6140 and 7100 are necessary for students to work with school-related family issues, individual counseling and children's counseling in practicum and internship.

Additional Requirements for Couple and Family Therapy (MA)

COUN 5160 - Techniques in Family Therapy
COUN 5170 - Issues In Family Studies
COUN 5180 - Counseling Couples
COUN 6000 - Introduction to Sex Therapy
COUN 6140 - Counseling Children, Adolescents and Their Parents
COUN 6160 - Advanced Assessment: Theory and Treatment in Family Systems
COUN 6250 - Mental Health Diagnosis

Total: 21 Hours

Additional Requirements for Higher Education and Student Affairs*

COUN 5050 - Foundations of Student Affairs
COUN 5500 - Diversity in Higher Education
COUN 5130 - Student Development Theory
HDFR 5003 - Leadership and Organizations
COUN 5070 - Higher Education Law and Ethics
COUN 5930 - Internship in Counseling
Comprehensive Exam

Total: 15 Hours

*Students who have completed higher education and student affairs courses as part of the Human Development and Family Relations undergraduate major or minor at CU Denver, will be allowed to use these courses to satisfy program requirements; but, they will not receive graduate credit for these courses. As such, these students will be required to take elective courses to reach the 45 credit hour requirement.

Counseling Clinical Experiences

COUN 5910 - Practicum in COUN
COUN 5930 - Internship in Counseling

Total: 12 Hours

*not required for students in the higher education and student affairs track

Criminal Justice MCJ

Introduction

► Graduate School Rules apply to this program

Program Director: Callie Marie Rennison, PhD

The master of criminal justice (MCJ) program is designed for students interested in comprehensive professional graduate education in the fields of criminology and criminal justice. It is intended to develop in the student an in-depth understanding of the fields within criminal justice and criminology and of background material from supporting disciplines, which enables the student to adapt to many operational specializations.

As an academic and professional field of study, this program is dedicated to preparing men and women not only to administer the system as it presently exists-but also to evaluate, to analyze and to change-to become pioneers in accelerating the shaping of a rational and responsive criminal justice system.

To deal with this system effectively, research design capability must be developed along with the skills required for the ordering and analysis of empirical data. This course of study prepares the student to be an innovator in crime control and prevention through course work dealing with strategies and skills for promoting individual, organizational and social change.

Faculty

Professors:

Mary Dodge, PhD, University of California Irvine
Angela Gover, PhD, University of Maryland
Mark Pogrebin, PhD, University of Iowa
Eric Poole, PhD, Washington State University
Callie Marie Rennison, PhD, University of Houston

Associate Professors:

Lori Hughes, PhD, Washington State University

Assistant Professor:

Lonnie Schaible, PhD, Washington State University

Senior Instructor:

Lucy Dwight, PhD, Pennsylvania State University
Sheila Huss, PhD, University of Colorado Denver

MPA AND MCJ-General Information

Admission Requirements

1. Applicants must have a baccalaureate degree from a college or university of accredited standing, with a minimum GPA of 3.0. Two sets of official transcripts are required from all higher education institutions attended.
2. Applicants must provide three recommendations from qualified references. Recommendations may be from professors, employers and/or others acquainted with the prospective student's professional and/or academic work.
3. Applicants are required to take the GRE, the GMAT or the LSAT unless they meet the requirements for waiver. Standard graduate admission test scores are normally waived when the candidate already has a graduate degree in another field from an accredited institution. Other applicants may have test scores waived if they have an undergraduate GPA of 3.0 or better *and* they have *significant* post-baccalaureate professional employment in management or policymaking positions for a minimum of 10 years or the equivalent.
4. A current resume highlighting professional accomplishments and community involvement, a short essay stating educational and career goals, a declaration of program form, and an application fee are also required.
5. International applicants may have different admission requirements and should check with the Office of International Affairs. In particular, international students whose first language is not English are required to take the TOEFL or IELTS. A composite score of 6.5 on the IELTS, or a composite score of 80 on the TOEFL, with accompanying minimum IELTS or TOEFL subscores of 20 or greater, is required.

All application material and test scores should be sent to SPA, University of Colorado Denver, Campus Box 142, P.O. Box 173364, Denver, CO 80217-3364.

SPA will review applications as soon as they are complete. Master-level applicants generally receive notification of their admission status three weeks after all materials have been received in the office. The preferred deadlines listed below allow students to receive best consideration for scholarships, financial aid and course selection. *Students who do not meet the preferred deadline may still submit application materials until approximately one month before the start of classes and will be considered on a space-available basis.*

Preferred Application Deadline

Fall - March 1
Spring - October 15
Summer - March 1

*Final Deadline**

Fall - August 1
Spring - December 1
Summer - May 1

*Final deadline does not apply to international students who should contact the Office of International Affairs for deadline information.

Provisional Admission

In exceptional cases, a student who does not otherwise meet the minimum requirements for admission may be admitted on provisional status if elements of their application suggest they may be able to succeed in the program. Students admitted on a provisional basis take two core courses in their first semester, and must earn at least a B in each course.

MCJ students may select two of the following for their first semester:

- CRJU 5001
- CRJU 5003
- 5002 or 5005

Based on their performance in these courses, a formal decision will be made concerning their admission into the program. Provisionally-admitted students may not take any other courses at SPA until they have been formally admitted to the program.

Nondegree Admissions

Students may register as nondegree students while developing their application packet. However, students are discouraged from taking multiple courses as a nondegree student if they hope to pursue a degree. No more than nine semester hours taken in the program as a nondegree student may be applied to the master's degree programs, with approval of an advisor. Taking courses as a nondegree student does not guarantee later admittance into the MCJ program. Nondegree student application forms are available in the Office of Admissions or online.

Transfer of Credit to SPA

Up to 9 semester hours of appropriate graduate work from an accredited college or university may transfer, if such credit was not applied to a completed degree.

Limitation of Course Load

The normal course load for a full-time MCJ student is 6 to 9 graduate credit hours per semester; full-time status for MCJ graduate students is 5 graduate credit hours per semester for financial aid determination. A student who is employed full-time is strongly advised not to carry more than 6 graduate semester hours in the MCJ program. Students who wish to carry a graduate course load above 9 hours per semester must consult their advisor and/or student service coordinator first.

Financial Assistance

Students in the master's degree programs are eligible for several types of financial assistance. Educational loans require application to the CU Denver Office of Financial Aid and completion of the FAFSA. A number of students secure internships or other part-time positions with local, state and federal agencies in the Denver metropolitan area. Scholarship assistance is available on a limited basis.

The school receives announcements for fellowships from various government organizations and actively seeks additional funding for student support in the form of internship positions and research assistantships.

Persons interested in applying for financial assistance should inquire in the SPA office. The deadline for current students is March 1 for the fall term. Prospective students seeking scholarship funds should have complete scholarship applications on file at the SPA office by the preferred application deadline for the semester they are requesting funds.

The Internship Program

An internship for the MPA and MCJ programs is required for students who have not had the equivalent of at least one year of professional full-time experience in the field, following the awarding of their Bachelor degree. The purpose of the internship is to continue the linkage between theory and practice that is the philosophical basis of SPA. Internships generally involve substantive part-time work undertaken during the course of one semester. A maximum of three semester hours will be awarded for internship service. Placements have included the Governor's Office, Colorado General Assembly, Denver Mayor's Office, City of Denver, Denver Police Department, Boulder Crime Lab, Western Governor's Association, the National Conference of State Legislatures, the Colorado Department of Public Health and Environment and the Denver Center for the Performing Arts.

Time Limit for Master's Degree

Master's degree students must complete all course work and degree requirements within seven years of registration in their first course.

MCJ Degree Requirements

The minimum requirements for the basic MCJ degree are outlined below. Occasionally, changes are made; students may graduate under the requirements that were in effect when they were admitted.

1. Graduate Course Work

The program leading to the MCJ degree requires a minimum of 36 semester hours of appropriate graduate study with an average of B (3.0) or better. No grade below B- will be accepted for graduate credit. No more than 6 semester hours of independent study can be applied toward the degree.

2. Core Courses

The completion of the following core courses is required with a grade of B- or better:

- CRJU 5001 - CJ Systems, Policies/Practice
- CRJU 5002 - Criminological Theory
- CRJU 5003 - Research Methods
- CRJU 5004 - Statistics
- CRJU 5005 - Law & Society

3. Course Work

Students must complete a minimum of 27 semester hours of course work in criminal justice.

4. Criminal Justice Internship

Students who have not had one year of criminal justice experience following the awarding of their Bachelor degree are required to complete CRJU 6910 (field study). A minimum of 240 hours of supervised work is required to earn 3 hours of credit. Students must have completed 18 credit hours with a GPA of 3.0 prior to enrolling in the internship course.

5. Capstone

All MCJ students, except those pursuing the thesis option, must complete the capstone course (CRJU 5361) during the last semester of their degree program. All core classes must be completed before taking the capstone. Students admitted before spring 2009 may opt to take a written comprehensive exam in lieu of CRJU 5361. The capstone cannot be taken during the summer semester.

- CRJU 5361 - Capstone Seminar

Students must receive the approval of both a faculty advisor and the director of the criminal justice program to complete a thesis for 3–6 semester hours in lieu of the advanced seminar.

Elective Courses

The courses listed below may be taken as electives for the MCJ degree:

- CRJU 5200 - Wrongful Convictions
- CRJU 5210 - Prisoner Reentry
- CRJU 5220 - The American Jury System
- CRJU 5250 - Criminal Offenders

- CRJU 5260 - Crime and Literature
- CRJU 5270 - Case Studies in Crim Justice
- CRJU 5280 - Computer Crime
- CRJU 5301 - Crime and Media
- CRJU 5320 - Police Administration
- CRJU 5325 - Qualitative Methods for Criminal Justice
- CRJU 5330 - Gangs and Criminal Organizations
- CRJU 5391 - Sex Offenders and Offenses
- CRJU 5410 - Victimology
- CRJU 5420 - Violence in Society
- CRJU 5430 - Drugs, Alcohol and Crime
- CRJU 5510 - Contemporary Issues in Law Enforcement
- CRJU 5520 - Corrections
- CRJU 5530 - Community Corrections
- CRJU 5540 - Juvenile Justice Administration
- CRJU 5550 - Criminal Justice Policy and Planning
- CRJU 5551 - Courts, Law & Justice
- CRJU 5552 - Criminal Justice Ethics
- CRJU 5553 - Women and Crime
- CRJU 5555 - Profiling Criminal Behavior
- CRJU 5571 - The Social Organization of Crime
- CRJU 5572 - Race, Crime and Justice
- CRJU 5574 - White Collar Crime
- CRJU 5575 - The Mentally Disordered Offender
- CRJU 5576 - Social Science in the Criminal Justice System
- CRJU 6600 - Special Topics in Criminal Justice

MCJ Options

Concentrations and Graduate Certificates

Crime Analyst Concentration

A student may choose to complete a concentration in crime analysis studies as part of the MCJ degree, or the crime analyst program can be completed by non-degree students as a stand-alone graduate certificate. The certificate emphasizes criminal justice and criminology related subjects. Nonetheless, the analytic skills learned in this concentration or certificate can be easily transferred to non-criminal justice and criminology related fields. This is the beauty of the skills taught - they are not industry specific.

Students seeking a crime analyst concentration must complete 15 semester hours from the following required courses.

Requirements:

- CRJU 5003 - Criminal Justice Research Methods
- CRJU 5004 - Criminal Justice Statistics
- CRJU 5325 - Qualitative Research Methods

CRJU 6600 - Intelligence Writing and Briefing
CRJU 5331 - Law Enforcement Analysis

Total: 15 Hours

Gender-Based Violence Concentration/Graduate Certificate

A student may choose to complete a concentration in gender-based violence studies as part of the MCJ or MPA degree, or the gender-based violence program can be completed by non-degree students as a stand-alone graduate certificate. The program on gender-based violence provides an interdisciplinary perspective on crime, the formulation of laws and codes, the criminal legal system and its intersection with gender and violence. Students seeking a gender-based violence concentration must complete 15 semester hours related to gender-based violence, which are completed via intensive in-person and online hybrid courses that meet periodically throughout a two-year period.

Requirements

Students take the four specified courses below and one elective.

- PUAD 5910 - Nature and Scope of Interpersonal Violence
- PUAD 5920 - The Psychology of Interpersonal Violence
- PUAD 5930 - Interpersonal Violence Law and Policy
- PUAD 5940 - Interpersonal Violence Leadership, Advocacy, and Social Change
-

Total: 15 Hours

Emergency Management and Homeland Security Concentration

The graduate concentration in Emergency Management and Homeland Security is available as a concentration within the MCJ programs, or as a stand-alone certificate for non-degree students. This concentration, which requires 15 credit hours (5 courses), provides advanced education in the management of emergencies, hazards, disasters, and homeland security. Students completing this sequence will have the knowledge and skills necessary to assess and manage a broad range of hazards and disasters, and to understand the policy environment in which emergency management occurs.

Requirements

Students take two of the following three required courses as well as three elective courses approved by their advisor. The three elective courses may be drawn from the student's particular area of interest, such as policy and management, spatial analysis and quantitative assessment, or public safety.

- GEOG 5230 - Hazard Mitigation and Vulnerability Assessment
- PUAD 5650 - Public Policies for Homeland Security and Disasters
- PUAD 5450 - Law of All-Hazards Management

Online Option

The master of criminal justice degree may be earned in the online format. Designed to serve students who are looking for a high-quality education, but who need an alternative to traditional classroom instruction, students may elect to do one or all of their courses online. This option allows students to complete the entire degree at a distance or to choose to come to campus for some courses while using an interactive online format for others.

Curriculum and Instruction MA

The Curriculum and Instruction (C&I) program offers a Personalized Professional MA degree, a MA degree plus endorsement, and endorsements in a variety of areas. The program is intended to provide licensed K-12 teachers the skills and understanding necessary for an ever-increasing diverse student body and to prepare them for curriculum development, implementation, and assessment. The program is also beneficial for those individuals who work in community colleges, professional development, or other ancillary services in education and beyond. This is not a licensure program. No teacher license will be issued upon successful completion of the program.

MA C&I Degree, MA C&I Degree + Endorsement, and Endorsement Areas

Personalized Professional C&I MA Degree with Concentration in: no license or endorsement)	C&I MA Degree + Endorsement	Endorsement Only
Culturally and Linguistically Diverse Education	C&I MA w/Culturally and Linguistically Diverse Education with K-12 endorsement	Culturally and Linguistically Diverse Education (K-12)
Reading and Writing	C&I MA w/Reading and Writing with Reading Teacher Endorsement: Elementary K-6, Secondary 7-12, or K-12	Reading Teacher: Elementary K-6, Secondary 7-12, or K-12

English Education		
Math Education		
Science Education		
Math and Science Education		
Special Education	C&I MA w/Special Education with Generalist Endorsement, Ages 5-21	Special Education Generalist Endorsement, Ages 5-21

The Master of Arts (MA) in Curriculum and Instruction offers three degree paths:

1. **Personalized Professional:** The customizable 30 credit hour MA path provides the opportunity for you to tailor your coursework to your specific needs as an Educator. Students choose from one of several concentration areas in which to focus, while having the flexibility to choose courses outside the concentration area for additional learning from the Thematic Course Categories. This MA does NOT lead to a license or an endorsement.
2. **MA plus endorsement:** The MA plus endorsement allows students to add an endorsement to their current teaching license in a variety of areas. In this program, students receive a MA and an endorsement. Recommendation for endorsement(s) is made by the C&I Program, but endorsement is granted by the State of Colorado. Individual State requirements vary and may include teaching experience and examinations in addition to a valid teaching credential. Students should consult with the Colorado Department of Education for the most updated endorsement requirements. http://www.cde.state.co.us/cdeprof/licensure_authorization_landing.
3. **MA for teacher licensure completers:** Students who have completed the Teacher Education licensure program in the SEHD have the option of completing their MA in Curriculum and Instruction.

Concentration Areas

Culturally and Linguistically Diverse Education Concentration

This concentration helps licensed teachers enhance their skills and credentials for working with English language learners. This concentration emphasizes a socio-cultural approach to issues of language and learning, acknowledging the legitimacy of linguistic and cultural differences, and recognizing that academic settings represent important socializing forces in students' lives. We emphasize the "whole learner" in our teaching and in teacher education, understanding that individuals do not merely add a language to their repertoire of communication but make fundamental identity adjustments as they progress in their studies. Course work includes language teaching methodology, language acquisition, linguistic analysis of English, multicultural foundations, assessment, literacy, and other areas.

Literacy, Language and Culturally Responsive Teaching Concentration

Reading and Writing

This concentration will enhance your literacy instruction skills and credentials while providing advanced knowledge and training to work with diverse student populations as they develop reading, writing, and oral language skills. Course work includes language and literacy acquisition, culturally relevant teaching practices, literature, literacy assessment and informed instruction, hands-on practice, and other areas. We stress the importance of recognizing a variety of literacies - home, school, community, and mainstream - in both first and second languages, and the meaningful use of literacy and language to improve students' quality of life.

English Education

This concentration prepares licensed Secondary English or language arts teacher to work with diverse adolescents as they develop an appreciation for literature and composition. Course work includes theory and methods of English education, linking assessment and instruction, and practicum experience. The study of contemporary, ethnic, and classic literature, reading, and writing are woven together, along with speaking, listening, and viewing. We stress the importance of recognizing a variety of literacies - home, school, community, and mainstream - in both first and second languages, and the meaningful use of literacy and language to improve students' quality of life.

Mathematics Education Concentration

This concentration promotes elementary and secondary mathematics teachers' passion, confidence, and competence in providing mathematics teaching-learning processes informed by insightful theories, effective learning activities, and innovative teaching strategies, as well as by international perspectives. This concentration area focuses on integration of theory, research, and practice to enable teachers to make instructional decisions and implement mathematics lessons that promote students' conceptual understandings and problem solving, including opportunities for doing research.

Science Education Concentration

This concentration promotes elementary and secondary science teachers' passion, confidence, and competence in providing science teaching-learning processes informed by insightful theories, effective learning activities, and innovative teaching strategies, as well as by international perspectives. This concentration area focuses on integration of theory, research, and practice to enable teachers to make instructional decisions and implement science lessons that promote students' conceptual understandings and problem solving, including opportunities for doing research.

Mathematics and Science Education Concentration

This concentration area combines the mathematics education and science education fields to prepare teachers who can bridge these disciplines into exciting and innovative programming for students. It draws on the learning activities and experiences provided in the mathematics education and science education concentration areas.

Special Education Concentration

This concentration emphasizes the development of reflective practitioners through trans-disciplinary training, fosters reflective inquiry about teaching and learning, as well as the development of the skills,

knowledge, and dispositions necessary to teach in elementary and secondary classrooms serving students with disabilities. Reflection and inquiry provide an informed and integrated basis for advocating for all learners.

Early Childhood Education MA

Office:

Lawrence Street Center, 701

Telephone:

303-315-6300

Fax:

303-315-6311

E-mail:

education@cudenver.edu

Web site:

www.ucdenver.edu/education

Faculty:

More information about faculty in this division is available online at www.ucdenver.edu/education

About the early childhood education program

The early childhood education (ECE) program leads to a master's degree in early childhood education and/or Colorado teacher license in early childhood special education (ECSE) specialist. The program prepares leaders who will enrich the life experience of young children (birth to 8 years) and their families through a variety of professional roles.

The ECE program is interdisciplinary in focus, drawing on university resources and the clinical expertise of various community professionals. There is a strong emphasis on fieldwork and practicum experiences in both regular and special education concentrations. Field experiences are a part of each course and provide an opportunity for each student to gain knowledge, abilities and dispositions while interacting with children, families, program staff and community agencies. Practicum experiences are designed to allow students to apply knowledge and practice skills in a closely supervised environment.

Curriculum and Program Requirements

Semester Hour Requirements

Master's degree in ECE: 30 semester hours

ECSE specialist license: 33 semester hours

Master's degree plus ECSE specialist license: 39 semester hours

Master's degree plus ECSE specialist added endorsement: 33 semester hours

ECSE specialist added endorsement: 24 semester hours

Early childhood education and the early childhood special education focus share course content in:

- language development and disorders
- child growth and development, differences and disorders
- learning approaches with young children
- measurement and evaluation
- basic statistics/research methods
- multicultural education
- research and current issues
- early childhood curriculum and program development for inclusive classrooms
- working collaboratively with parents and families
- program administration/leadership

The early childhood education program provides specialized training in:

- language acquisition and development
- literacy instruction
- infant/toddler development
- early childhood mental health and social competence

The early childhood special education program provides specialized training in:

- screening and assessment of young children
- intervention strategies with infants and preschoolers
- behavior management
- working as a member of the transdisciplinary team
- cognitive and socio-emotional development and disorders
- treatment of children who have neurological impairment and chronic illness
- challenging behaviors and autism

For more information on coursework and plans of study, please contact an advisor in the School of Education and Human Development.

Fieldwork and Practicum Requirements

The master's degree in early childhood education includes a total of 425 hours of required fieldwork/practica. Approximately 200 hours of fieldwork are associated with course assignments; 225 hours of intense, culminating practica occur toward the end of the second year of study. Students completing the MA program take a written comprehensive exam (take home) during the final semester of their program (concurrently with courses at the end of the program sequence).

For the master's degree in early childhood education plus the ECSE specialist initial license, a total of 800 hours of fieldwork/practica is required. Approximately 290 hours of fieldwork are associated with course assignments; 510 hours of intense, culminating practica occur toward the end of the second year of study. Students seeking an added endorsement in ECSE specialist also complete 510 hours of practicum experiences.

Economics MA

► Graduate School Rules apply to this program

Admissions Advisor: Brian Duncan (brian.duncan@ucdenver.edu)

Schedule Advisor: Hani Mansour (hani.mansour@ucdenver.edu)

The MA program in economics is designed to train students in the quantitative and applied economic skills that will best enhance their future employment opportunities in the private and public sectors, or their pursuit of PhD studies in economics or related fields.

Our MA program emphasizes extensive training in mathematical and quantitative analysis, including the provision of substantial exposure to applied econometrics, working with large and diverse data sets, and a wide range of statistical software. The program gives students the applied skills that employers demand, provides those pursuing advanced degrees an edge in gaining admission to top-flight PhD programs-and enhances the likelihood of the student's ultimate success.

Admission Requirements

- Meet all general admission requirements of the Graduate School (including a 2.50 undergraduate grade-point average).
- Submit three letters of recommendation (at least two letters should come from individuals who are familiar with your scholarly record. The third can be an additional academic reference or professional reference from someone who knows you well and can comment on your potential as a graduate student).
- Submit official transcripts from all colleges attended.
- Have completed 15 credit hours of undergraduate economics, including intermediate microeconomic theory and intermediate macroeconomic theory (upper division courses).
- Have completed courses in calculus and statistics (preferably a year of calculus and a course in econometrics or similar upper division statistics course. A course in linear algebra and/or differential equations is recommended).
- Submit GRE scores. All applicants, international and domestic, must submit GRE scores regardless of prior degrees, course work, or work experience. The institution code for CU Denver is 4875. Most students admitted to the MA program in economics score 154 or above (690 or above using the prior test scale) on the quantitative section of the GRE. However, this is not a minimum GRE cutoff score, nor is it a score above which admission is guaranteed. GRE scores are used in conjunction with other indicators of academic success at the Master's level. Applicants must show strong evidence of quantitative ability either through high grades in math, statistics, and economic courses, a high quant score on the GRE, or preferably both.
- International students must submit TOEFL scores. The minimum required score is 203 (computer-based TOEFL), 75 (IBT-based TOEFL), 537 (paper-based TOEFL), or 6.5 (IELTS). The institution code for CU Denver is 4875. The minimum TOEFL scores are a requirement of the Graduate School and cannot be waived by the department of economics. The Graduate School may waive the TOEFL requirement for applicants who have attended a college or university in the United States as a full-time student and have completed two semesters of academic work with a "B" average (3.0 GPA or higher). Please contact the International Admissions office if you have questions about this requirement.

Application Deadlines:

Fall - June 1

Spring - December 1

The Department of Economics accepts late applications after these official deadlines. However, there is no guarantee that a late application will be processed in time for the start of the semester. Students are encouraged to apply well in advance the application deadline.

International students who apply after the June 1 or December 1 deadline may not have time to obtain a student visa. Being admitted to the MA program in economics does not guarantee that a student will receive a student visa in time for the start of the semester. International students who are admitted to the MA program, but fail to obtain a visa in time, may defer admission for up to one year. All questions about student visas should be directed to the Office of International Admissions.

Degree Requirements

The MA degree requires the completion of 30 semester hours of coursework, of which 21 hours are core requirements. Each student's plan will be worked out in conjunction with the graduate advisor.

Students are expected to meet all course prerequisites. A grade of B- or better is required in all courses, with a cumulative grade point average of B (3.0) or above. No course may be taken more than twice.

Core Courses

- ECON 5073 - Microeconomic Theory
- ECON 5083 - Macroeconomic Theory
- ECON 5803 - Mathematical Economics
- ECON 5813 - Econometrics I
- ECON 5823 - Econometrics II
- ECON 6053 - Seminar In Applied Economics
- ECON 6054 - Seminar In Applied Economics II
- ECON 6073 - Research Seminar

Total: 21 hours

Electives

Three courses numbered 5000 or higher with an ECON prefix (9 semester hours). After completing 6 credit hours of ECON 6053/6054 as part of the economics core, additional ECON 6053/6054 courses may be counted as electives.

Total: 9 Hours

Degree Total: 30 Hours

Education & Human Development (EDHD) MA

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Website: www.ucdenver.edu/education

Faculty

Information about EDHD faculty is available online at www.ucdenver.edu/education.

Master's Degree

The MA program in education and human development prepares students to facilitate the teaching/learning process and to lead and work in community-based environments. Thus, many students pursue the degree to enhance their skills as professional classroom teachers or lead in the community. The degree also provides skills necessary for a variety of roles in educational and teaching settings or community environments where knowledge of learning, development, understanding family and community systems, motivation, and research is essential such as teaching at the community college and teaching-based colleges and universities levels, teaching adults, consulting, developing assessments, community-based leadership, and conducting program development and evaluation. Other students seek the MA as preparation for advanced study in educational psychology, family science and human development, research, or related fields.

Areas of Study

Four major areas of concentration are available- learning, human development and family relations, research and evaluation, and assessment. Regardless of the concentration area selected, all students must:

- demonstrate competence in education and human development by successfully completing 30 semester hours of relevant course work;
- complete a capstone experience either a practicum or a master's thesis in consultation with their faculty advisor based on the students' professional and academic goals; and
- perform satisfactorily on a written comprehensive examination (excluding thesis students) (typically during the last term enrolled in regular courses).

Learning

This program prepares students to apply research-based knowledge and to develop culturally relevant knowledge and skills that inform a wide range of practices and issues within the field of education and innovative learning environments. This program concentration provides opportunities for the student to develop an in-depth understanding about human learning across age groups, in formal and informal educational and community contexts. Courses will focus on the learning process including cognition, instructional design, motivation and developmentally appropriate practices to support learning for children, adolescents and adults within a sociocultural framework..

Human Development and Family Relations (HDFR)

Students will engage in developing their skills to work in and lead community-based organizations including, but not limited to secular, faith-based, for profit, nonprofit, school-based, and local, state, federal and international organizations. The importance of family diversity and social justice is stressed throughout the HDFR curriculum through its courses and experiences. Students can also develop their knowledge in family relations in preparation for doctorate studies in family science and human development or related areas.

The EDHD program does provide a pathway for MA students (HDFR and Learning areas) to pursue their PhD in EDHD with a Family Science and Human Development concentration. For more information please visit our School of Education and Human Development.

Students who complete the MA in EDHD with a HDFR emphasis will also be eligible to complete the bilingual (Spanish) Family and Community Services concentration area in preparation to work with Spanish speaking families and communities. Advisor approval is required for this concentration.

The HDFR area also provides classes to all School of Education and Human Development (SEHD) graduate programs, offering courses in family theories, family dynamics, and diverse family systems, Latino family, school and community systems, family resource management, leadership and organizations, grant writing and fund raising, program development and other family relations based courses.

Research and Evaluation Methods (RSEM)

RSEM students will acquire skills necessary for a variety of roles that involve data driven decisions. Students who complete the MA will be better prepared to facilitate decision making based on evidence. Some students pursue the degree to enhance their skills as classroom teachers; others move out of the classroom and work in environments where information and data from different sources can be used to make informed decisions.

The RSEM area also provides classes to all education graduate programs, offering courses in research methods, evaluation, statistics, analysis, assessment, and measurement.

Assessment

This program concentration provides opportunities for you to develop an in-depth understanding about educational psychology as it relates to learning-related assessment. You'll address issues in both classroom and large-scale assessment and focus on other forms of assessment, such as portfolios and performance assessments. You also may specialize in assessment in a content area like literacy or mathematics.

Electrical Engineering MEng

► Graduate School Rules apply to this program

A minimum of 30 credit semester hour of academic work acceptable to the Advisory Committee (within the rules established by the College of Engineering and Applied Science) will be required for the Master of Engineering degree. In compliance with the Graduate School rules, the minimum grade required for a unit to count toward the 30 semester hours is a B minus (2.7). To couple this degree with electrical engineering, at least 15 of these hours must be 5000-level or above in electrical engineering courses, and must be taken in the CU Denver Department of Electrical Engineering. As many as 15 hours can be taken outside of electrical engineering, included 3 credit hours for the master of engineering project. The project should cover some area of creative investigation performed by the student and may relate directly to his/her professional work. The project must be defended orally before the Advisory Committee.

The student who wishes to enter the master of engineering program should apply to the electrical engineering department in the same manner as a master of science applicant.

Electrical Engineering MS

► Graduate School Rules apply to this program

To fulfill the requirements for the master of science in electrical engineering (MSEE), the Electrical Engineering Department at CU Denver requires that within a seven-year period, the candidate completes and approved program in one of two options: (a) a **thesis option** consisting of at least 30 semester hours, including 6 credit hours of MS thesis, or (b) a **course-only option** consisting of at least 30 semester hours. It is also required the the MSEE candidate maintain a grade point average of 3.0 or higher. In compliance with the Graduate School rules, the *minimum* grade required for a unit to count toward the required semester hours is B minus (2.7).

For both thesis and course-only master of science in electrical engineering options, the student must select a primary area of concentration and a secondary area of concentration, among the six areas listed below. The areas should be chosen a priori with the student's graduate advisor. The student must take at least four 3-hour graduate courses (12 credit hours) in his/her primary area of concentration, and at least two 3-hour graduate courses (6 credit hours) in his/her secondary area. All of these courses must be taken through the CU Denver EE Department. The remaining courses may be taken from any area of concentration. A student may also take one 3-credit independent study course with a graduate faculty member of the CU Denver EE department. At least 21 graduate credit hours must be taken from the CU Denver EE Department. At the discretion of the EE graduate committee, a maximum of nine graduate credits may be transferred from other programs.

The CU Denver EE Department offers six areas of concentration at the master's level:

1. Communications and Signal Processing
2. Computer Engineering and Embedded System Design
3. Controls and Signal Processing
4. Electromagnetic Fields, Waves and Optics
5. Energy and Power Systems
6. Microelectronics and VLSI

English MA

► Graduate School Rules apply to this program

Program Director: Philip Joseph

Telephone: 303-556-4648

E-mail: philip.joseph@ucdenver.edu

The department offers an English MA degree focused around five core courses with specializations available in literature, rhetoric and the teaching of writing, and applied linguistics.

Contact the graduate program director for more information on these programs.

Requirements for Admission

The deadline for summer or fall admission is April 1; the deadline for spring is October 1. Complete applications must include the following:

- a completed University of Colorado graduate application
- one copy of all graduate and undergraduate transcripts, and for any nondegree courses previously taken
- three letters of recommendation in which the recommender specifically addresses the candidate's ability to pursue successfully the program chosen
- recent scores on the GRE general test, which includes the analytical, verbal and quantitative portions. GRE score average should be 155 or higher. Analytical writing score should be 4 or higher.
- evidence of a 3.0 GPA in previous courses
- a one-page statement of purpose
- 10-page critical writing sample

In addition to these requirements, applicants for the program must have successfully completed 24 semester hours in English courses (graduate or undergraduate), excluding courses in composition, creative writing or speech. At least 15 of these semester hours must be at the upper-division level.

Transfer of Credits from Other CU Campuses

Students admitted to graduate study in English may complete all of their course requirements for the MA degree at CU Denver. Up to 9 semester hours (total) may be transferred from the University of Colorado Boulder, University of Colorado Colorado Springs or other graduate program; however, such transfer requires the written approval of the graduate advisor. Only 9 semester hours of courses taken at CU Denver before acceptance into the program can be counted toward the degree. Further, work already applied toward a graduate degree received at the University of Colorado or at another institution cannot be transferred toward another graduate degree of the same level at CU Denver. (For other rules concerning transfer of graduate credits, see the Graduate School Rules.) For more information, contact the graduate program director at 303-556-2575.

Degree Requirements

GENERAL REQUIREMENTS

- Satisfactory completion of all required course work
- Demonstrated fourth-semester proficiency in a foreign language. Old English or Latin will also satisfy this requirement
- Compliance with all graduate school policies and requirements

COURSE REQUIREMENTS (30 SEMESTER HOURS MINIMUM)

Total Hours Required: 30-33 hours

All courses are 3 credit hours unless otherwise noted.

Students must receive a *B-* or above in all courses counted toward the MA degree.

REQUIRED COURSES

- ENGL 5100 - Introduction to Graduate Studies
- ENGL 5135 - English Language Study
- ENGL 5145 - Theory

- ENGL 5155 - Genres of Writing
- ENGL 5165 - Literacy and Technology

Total: 15 Hours

AREA REQUIREMENTS

Students may choose to concentrate 12 hours of English graduate courses in a particular area of study that meets the student's goals in the program.

Total: 12 Hours

THESIS OR PORTFOLIO OPTIONS

- ENGL 6950 - Master's Thesis
(4-6 hours)
Students must consult with and submit a proposal to the graduate committee for approval.
- or
- ENGL 6970 - Portfolio Exam
(3 hours)

Total: 3-6 Hours

Additional Information

Candidate for Degree: Graduate students must be registered for at least one credit hour during the semester that they graduate. Those who have completed all required courses and requirements may register for Candidate for Degree: CAND 5940 section 900.

Teaching Assistantships: Graduate students who receive a teaching assistantship must take ENGL 5913 - Practicum in Language and Rhetoric in the fall during their first semester as a teaching assistant. ENGL 5913 may also be counted as an elective.

Independent Study: Graduate students may only count 6 credit hours of Independent Study toward the English MA degree.

Environmental Sciences MS

- Graduate School Rules apply to this program

Program Director: Anne Chin

Office: North Classroom, 3522

Telephone: 303-556-3958

Fax: 303-556-6197

E-mail: anne.chin@ucdenver.edu

Web site:

<http://www.ucdenver.edu/academics/colleges/CLAS/Departments/ges/Programs/MasterofScience/Pages/MasterofScience.aspx>

Core Faculty of the M.S. in Environmental Sciences Program

Professors:

Anne Chin, Geography and Environmental Science
Pamela Jansma, Geography and Environmental Science

Associate Professors:

Casey Allen, Geography and Environmental Science
Peter Anthamatten, Geography and Environmental Science
Frederick B. Chambers, Geography and Environmental Science
Rafael Moreno-Sanchez, Geography and Environmental Science
Brian Page, Geography and Environmental Science
Gregory Simon, Geography and Environmental Science
Deborah S.K. Thomas, Geography and Environmental Science
Brian S. Wee, Geography and Environmental Science
John W. Wyckoff, Geography and Environmental Science

Assistant Professors:

Christy Briles, Geography and Environmental Science

Senior Instructors:

Amanda Weaver, Geography and Environmental Science

Instructors:

Matthew Cross, Geography and Environmental Science

Lecturers:

Richard DeGrandchamp, Geography and Environmental Science
Michael Hinke, Geography and Environmental Science

Faculty Affiliates to the M.S. in Environmental Sciences Program

Professors:

N. Y. Chang, Civil Engineering
Diana F. Tomback, Integrative Biology

Associate Professors:

Leo P. Bruederle, Integrative Biology
Greg Cronin, Integrative Biology
Michael J. Green, Integrative Biology
Glenn T. Morris, Political Science
Timberly M. Roane, Integrative Biology
Michael Wunder, Integrative Biology

Assistant Professors:

Annika Mosier, Integrative Biology

Indrani Pal, Civil Engineering
Alan Vajda, Integrative Biology

Environmental Sciences is a multidisciplinary study of the natural/physical environment. Academic fields involved in environmental sciences include chemistry, biology and ecology, physics, geology, geography, anthropology, engineering, political science, law, economics and the health sciences. Students planning to pursue the MS in Environmental Sciences must either have earned a bachelor's degree or have taken significant course work in the natural/physical sciences or engineering and completed several other prerequisites (see the following graduate information).

Environmental careers encompass a broad range of professions, from those with a strong foundation in the natural/physical sciences or engineering to those based in the social sciences and/or humanities. Students interested in environmental issues and careers should investigate the whole field before deciding which path to follow. At CU Denver, the MS in Environmental Sciences emphasizes the natural/physical sciences and engineering with the addition of the social sciences and humanities.

The MS in Environmental Sciences degree is designed to provide training in engineering, natural/physical sciences and social sciences. The goals of the program are (1) to enhance the interdisciplinary communication and analytical skills of the student, and (2) to provide a multidisciplinary approach for more intensive study of a particular environmental issue. Students will receive instruction in the physical and biological dynamics of various ecosystems, environmental engineering and socioeconomic issues associated with environmental analysis.

Graduates of the MS in Environmental Sciences program are involved in many different areas, such as reviewing environmental impact statements, monitoring groundwater quality and communicating with the public. Many students have found employment in various agencies (U.S. Environmental Protection Agency, U.S. Geological Survey, Colorado State Department of Public Health and Environment) and private-sector environmental and engineering firms.

Requirements for Admission

The program is for students who either have baccalaureate degrees or have significant background in one of the natural/physical sciences or engineering. In addition, minimum undergraduate science and math requirements are:

- one semester of calculus and one semester of upper-division statistics (*if applicant is missing the statistics course, he/she can be admitted but must take ENVS 5600, Applied Statistics, or an approved statistics course as an elective before receiving the MS in Environmental Sciences degree*)
- either two semesters of general chemistry with lab or two semesters of general biology with lab
- one semester of physics

If only two semesters of the prerequisite courses are lacking, students may be admitted, but must take them in the first year in the program. Applicants who have fulfilled all prerequisites have a better chance of acceptance. Applicants may be required to take additional prerequisite courses (necessary for completing particular core or elective courses). The prerequisite courses will not count toward the MS in environmental sciences degree. As part of the admission review process, applicants are required to submit a graduate application, a minimum of three letters of recommendation and transcripts from all institutions previously attended. CU Denver has a minimum requirement of a 3.0 undergraduate GPA for applicants to the Graduate School. The program admits new students for the fall semester only, and the number of students

admitted to the program depends, in part, on space availability. **Applicants must submit all materials by the January 20th deadline.**

Financial Aid

There are three types of financial aid available: student hourly teaching assistantship; research assistantship positions funded by grants to specific program faculty; and the regular package of financial aid (primarily loans) available through the financial aid office on the Denver campus. Incoming students will be automatically considered for program-distributed assistance at the time of admission to the program. Continuing students will be regularly apprised of available aid and positions. All other aid should be requested through the CU Denver Financial Aid Office, Student Commons Building 5th floor, Campus Box 125, P.O. Box 173364, Denver, CO 80217-3364. Telephone: 303-315-1850.

Internships

Students in the MS in Environmental Sciences program are strongly encouraged to contact the Experiential Learning Center for internships and paid positions related to environmental sciences. The Experiential Learning Center is located in the Tivoli Student Union, Suite 260. Telephone: 303-556-2250. Many students have had internships in federal agencies, such as the U.S. Environmental Protection Agency and the U.S. Geological Survey.

Program Requirements

The MS in Environmental Sciences is a 39-hour program that provides students with two alternate plans: Plan I requires a thesis, while Plan II is a non-thesis program. General requirements for the program include a set of core courses (12 semester hours) and elective courses (24-27 semester hours minimum). Students choosing to complete the thesis option must also complete 3 hours of thesis credit, while those choosing the non-thesis option must complete 3 hours of additional elective coursework.

The degree is offered through the College of Liberal Arts and Sciences with the cooperation of the College of Engineering and Applied Science. In addition, some courses offered by the College of Architecture and Planning, the School of Public Affairs and the Business School are relevant and applicable to the program.

Thesis Option

36 hours of coursework + 3 thesis hours:

- ENVS 6002 - Research Topics in Environmental Sciences (3 hours)
- ENVS 6004 - Research Methods in Environmental Science (3 hours)
- ENVS 6100 - Research Topics in Environmental Management (3 hours)
- ENVS 6800 - Community-Based Research Practicum (3 hours)
- 24 hours of elective courses
- GEOG 6950 - Master's Thesis (3 hours)

Non-thesis Option

39 hours of coursework:

- ENVS 6002 - Research Topics in Environmental Sciences (3 hours)
- ENVS 6004 - Research Methods in Environmental Science (3 hours)
- ENVS 6100 - Research Topics in Environmental Management (3 hours)
- ENVS 6800 - Community-Based Research Practicum (3 hours)
- 27 hours of elective courses

Elective Courses

(See the MS in Environmental Sciences website for a complete list of elective courses for the MS in Environmental Sciences program.)

Students, with the coordinator and/or an advisor, will complete a program plan that will include 24-27 semester hours of elective requirements that will meet their interests. Students may choose to use four of the electives to fulfill one of the following options offered in environmental sciences: air quality, ecosystems, environmental health, environmental science education, geospatial analysis, hazardous waste or water quality. Students must have the prerequisites for each course and must meet the requirements listed in the notes below. Contact the option advisor for the particular option of interest before starting. Upon graduation, the option will be noted on the student's transcript.

Following are the requirements for each environmental sciences option:

AIR QUALITY OPTION

Option Advisor: Frederick Chambers

Telephone: 303-556-4520

E-mail: Frederick.Chambers@ucdenver.edu

Required Courses

- CHEM 5710 - Air Pollution Chemistry
- ENVS 5730 - Air Quality Modeling and Analysis

Total: 6 Hours

Electives

Choose two:

- CHEM 5720 - Atmospheric Sampling and Analysis
- CVEN 5800 - Special Topics
(when Air Pollution Control is the topic)
- URPL 6800 - Special Topics: Urban and Regional Planning
(when Air Quality Planning and Policy is the topic)

Total: 6 Hours

Option Total: 12 Hours

ECOSYSTEMS OPTION*

Option Advisor: Christy Briles

Telephone: 303-352-3962

E-mail: Christy.Briles@ucdenver.edu

Required Courses

- BIOL 5415 - Microbial Ecology
- ENVS 5010 - Landscape Geochemistry

Total: 6 Hours

Electives

Choose two:

- ENVS 5731 - Mountain Biogeography
- ENVS 6220 - Toxicology (see Note 2)
- BIOL 5050 - Advanced Biology Topics
(when Seminar in Aquatic Ecology is the topic)
- BIOL 5154 - Conservation Biology
- GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing

Total: 6 Hours

Option Total: 12 Hours

* BIOL 5445, Applied Environmental Biology, is required as a prerequisite for the ecosystems option.

ENVIRONMENTAL HEALTH OPTION*

Option Advisor: Deborah Thomas

Telephone: 303-556-5292

E-mail: Deborah.Thomas@ucdenver.edu

Required Courses

- ENVS 6220 - Toxicology (See Note 2)
(fall, even years)
- ENVS 6230 - Environmental Epidemiology
(spring, even years)

Total: 6 Hours

Electives

Choose two:

- ANTH 4010 - Medical Anthropology: Global Health
- ENVS 5500 - Topics in Environmental Sciences (when Ecological Risk Assessment is the topic)
(See Note 2)
- ENVS 6210 - Human Health and Environmental Pollution
(spring, odd years)
- GEOG 5710 - Disasters, Climate Change, and Health
- PUAD 5633 - Seminar in Natural Resource and Environmental Health Law

Total: 6 Hours

Option Total: 12 Hours

* ENVS 6200, Risk Assessment, is required as a prerequisite for the environmental health option.

ENVIRONMENTAL SCIENCE EDUCATION OPTION

Option Advisor: Bryan Wee

Telephone: 303-556-6039

E-mail: bryan.wee@ucdenver.edu

Required Courses

- ENVS 5340 - Equity & Culture in Science Education: Local/Global
- ENVS 5650 - Environmental Education

Total: 6 Hours

Electives

Choose two:

- ANTH 5170 - Culture and the Environment
- BIOL 5154 - Conservation Biology
- COMM 5282 - Environmental Communication
- GEOG 5265 - Sustainability in Resources Management
- GEOG 5335 - Contemporary Environmental Issues
- GEOG 5440 - Science, Policy and the Environment

Total: 6 Hours

Option Total: 12 Hours

GEOSPATIAL ANALYSIS OPTION*

Option Advisor: Rafael Moreno

Telephone: 303-556-3762

E-mail: Rafael.Moreno@ucdenver.edu

Required Courses

- GEOG 5080 - Introduction to GIS
- GEOG 5090 - Environmental Modeling with Geographic Information Systems

Total: 6 Hours

Electives

Choose two:

- GEOG 5091 - Open Source Software for Geospatial Applications
- GEOG 5092 - GIS Programming and Automation
- CVEN 5382 - GIS Spatial Database Development
- CVEN 5385 - GIS Relational Database Systems
- CVEN 5386 - GIS Laboratory

Total: 6 Hours

Option Total: 12 Hours

* GEOG 3080, Introduction to Mapping and Map Analysis, is required as a prerequisite of the geospatial analysis option.

URBAN AGRICULTURE OPTION

Option Advisor: Amanda Weaver

E-mail: amanda.weaver@ucdenver.edu

Required Courses

- ENVS 5450 - Urban Food and Agriculture: Perspectives and Research
- ENVS 5460 - Sustainable Urban Agriculture Field Study I

Total: 6 Hours

Electives

Choose two:

- ENVS 5340 - Equity & Culture in Science Education: Local/Global
- ENVS 5470 - Sustainable Urban Agriculture Field Study II
- GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing
- GEOG 5085 - GIS Applications for the Urban Environment
- GEOG 5235 - GIS Applications in the Health Sciences
- GEOG 5640 - Urban Geography: Denver and the U.S.
- GEOG 5680 - Urban Sustainability: Perspectives and Practice

Total: 6 Hours

Option Total: 12 Hours

WATER QUALITY OPTION*

Option Advisor: Anne Chin

Telephone: 303-553-3958

E-mail: anne.chin@ucdenver.edu

Required Courses

- BIOL 5416 - Aquatic Ecology
- ENVS 5280 - Environmental Hydrology

Total: 6 Hours

Electives

Choose two:

- ENVS 5410 - Aquatic Chemistry
- CVEN 5333 - Surface Water Hydrology
- CVEN 5334 - Groundwater Hydrology
- CVEN 5335 - Vadose Zone Hydrology
- CVEN 5336 - Urban Runoff Quality and Quantity Modeling
- CVEN 5393 - Water Resources Development and Management

Total: 6 Hours

Option Total: 12 Hours

*CHEM 5700, Environmental Chemistry, or appropriate chemistry background is required as a prerequisite of the water quality option.

Notes:

1. Many of the elective courses have prerequisites; student must have met these requirements in order to take the course.
2. One course may not be used for more than one option, even if it is listed in several options. Other courses may be offered that will be acceptable as electives with approval of the option advisor and the director of the program.
3. Students may transfer up to 9 hours of approved graduate-level credit into the program. These courses must be approved by the Graduate Director and they may not replace core courses.
4. Students may take up to 6 credit hours of independent study approved by their advisor. If taking two independent study courses, these should be taken from separate faculty members. Independent study may not replace the core program requirements.

5. Students may not count 4000-level course toward electives in the program; this may be petitioned to the Graduate Committee in exceptional case.
6. By the end of the first semester, each student should identify and declare whether s/he is pursuing the thesis or non-thesis option. If intending to pursue the thesis option, the student should identify and gain agreement from a content advisor for guiding the thesis, filling out and submitting the appropriate departmental form.
7. Students may enroll in thesis preparation and writing hours only after submission of signed committee form, which requires approval of the thesis proposal.
8. Students will not receive a grade for thesis preparation and writing hours until the thesis is successfully defended.
9. Students should fill out and submit all relevant department forms for their files.
10. All work submitted for the environmental sciences options must have a grade of *B* (3.0) or better.
11. Students must follow the Graduate School deadlines for submission of paperwork for the graduation application, comprehensive exam, and any other deadlines. Links to these can be found on the GES/MS website.
12. Courses applied to either a certificate* or an MS degree may later be applied toward the other if all pertinent coursework is completed within a five-year time period.

* The Geospatial, Environmental Education, and Urban Agriculture options of the program lead towards independent graduate certificates. These certificates may be earned without entrance into the MS in environmental sciences program. (See the Geographic Information Science Graduate Certificate, Sustainable Urban Agriculture Graduate Certificate, and Environmental Science Education Graduate Certificate descriptions.)

Executive MBA in Health Administration

Distinctive Features of the Executive Program in Health Administration

1. Drawing on the expertise represented by the faculties of a consortium of western universities, the program offers high-quality courses taught by instructors that are typically not available from a single university.
2. The executive program facilitates learning for professionals who have continuing career and family responsibilities. The program is especially tailored for working individuals, allowing students to remain on their jobs while completing their educational program.
3. The program employs innovation in the technology of educational delivery. Learning methods include:
 - computer-assisted instruction and self-paced learning packages
 - computer conferencing and electronic case analyses
 - on-campus sessions

For application and additional information, write to:

Executive Program in Health Administration
 The Business School
 University of Colorado Denver
 P.O. Box 480006
 Denver, CO 80248-0006
www.colorado.edu/execed

Finance and Risk Management MS

Program Director: Jian Yang
Email: Jian.Yang@ucdenver.edu
Telephone: 303.315.8423

The master of science in finance and risk management provides the necessary depth and specialized expertise to meet the needs of businesses for financial managers, investment analysts and other finance specialists.

The program emphasizes a familiarity with the institutions in our financial system, an understanding of financial markets and instruments, and the analytical skills and tools necessary to make informed decisions about investment and financing.

The program is suited to students from a wide variety of undergraduate backgrounds and is particularly appropriate to students with strong technical and analytical backgrounds. Admission standards for the MS finance and risk management program are unique to the program. Therefore, admission to other graduate business programs does not guarantee admission into the MS finance and risk management program.

The MS in finance and risk management offers flexibility with on-campus and online courses. The MS finance and risk management degree requirements are met by the following courses and options:

Prerequisites

Prerequisites: BUSN 6550, Analyzing and Interpreting Accounting Information, or the equivalent of a financial accounting course taken within the last ten years with a "B-" grade or higher. Students are also expected to be knowledgeable in spreadsheet software.

Finance and Risk Management Core: (18 hours)

- FNCE 6290 - Quantitative Methods for Finance
- BUSN 6620 - Applied Economics for Managers
- BUSN 6640 - Financial Management
- FNCE 6300 - Macroeconomics and Financial Markets
- FNCE 6330 - Investment Management Analysis

Select 1 of the following 3 courses:

- FNCE 6380 - Futures and Options
- FNCE 6382 - Survey of Financial Derivatives
- FNCE 6410 - Real Options and Decisions Under Uncertainty

Specializations: (12 hours)

Students must complete one of the following specializations:

Finance Specialization

Students must select at least 3 courses with **FNCE/CMDT/RISK** prefix, numbered 6000 or higher. Remaining Finance Elective may be any of the following courses: **FNCE/CMDT/RISK** course numbered 6000 or higher, **ACCT 6140** Tax Planning for Managers, **ACCT 6340** Financial Statement Analysis, **ENTP**

6824 Entrepreneurial Financial Management, **ECON 5803** Mathematical Economics, **ECON 5813** Econometrics I, **ECON 5823** Econometrics II, **ECON 6801** Advanced Mathematical Economics, **MATH 5792** Probabilistic Modeling, or **MATH 5390** Game Theory.

Financial Analysis and Management Specialization

Select three or four of the following courses:

- CMDT 6682 - Trading in Commodity and Financial Markets
- FNCE 6310 - Financial Decisions and Policies
- FNCE 6340 - Business Firm Valuation
- FNCE 6360 - Management of Financial Institutions
- FNCE 6410 - Real Options and Decisions Under Uncertainty *FNCE 6410 cannot be used towards specialization if taken in Finance core.
- FNCE 6411 - International Corporate Governance
- FNCE 6420 - Mergers and Acquisitions
- FNCE 6450 - Short-Term Financial Management
- FNCE 6460 - Emerging Market Finance
- FNCE 6480 - Financial Modeling
- RISK 6129 - Practical Enterprise Risk Management
- RISK 6809 - Principles of Risk Management & Insurance
- RISK 6909 - Corporate Risk Management
- RISK 6509 - Global Risk Management

If 3 courses completed from list above, select 1 course from the list below:

- ACCT 6140 - Tax Planning for Managers
- ACCT 6340 - Financial Statement Analysis
- CMDT 6582 - Commodity Supply Chain Management
- CMDT 6802 - Foundations of Commodities
- ENTP 6824 - Entrepreneurial Financial Management
- MATH 5390 - Game Theory

Financial and Commodities Risk Management Specialization

Select three or four of the following courses:

- CMDT 6682 - Trading in Commodity and Financial Markets
- FNCE 6350 - Financial Innovations
- FNCE 6360 - Management of Financial Institutions
- FNCE 6370 - International Financial Management
- FNCE 6380 - Futures and Options *
- FNCE 6382 - Survey of Financial Derivatives *
- FNCE 6410 - Real Options and Decisions Under Uncertainty *
- *FNCE 6380, FNCE 6382, or FNCE 6410 cannot be used towards specialization if taken in Finance core.
- FNCE 6460 - Emerging Market Finance
- FNCE 6480 - Financial Modeling
- RISK 6129 - Practical Enterprise Risk Management
- RISK 6509 - Global Risk Management
- RISK 6809 - Principles of Risk Management & Insurance

- RISK 6909 - Corporate Risk Management

If three courses completed from above list, complete one course from the list below:

- CMDT 6582 - Commodity Supply Chain Management
- CMDT 6802 - Foundations of Commodities
- ECON 5823 - Econometrics II
- ECON 6801 - Advanced Mathematical Economics
- MATH 5351 - Actuarial Models
- MATH 5792 - Probabilistic Modeling

Risk Management and Insurance Specialization

Required Courses:

- RISK 6129 - Practical Enterprise Risk Management
- RISK 6809 - Principles of Risk Management & Insurance
- RISK 6909 - Corporate Risk Management

Quantitative Elective

Select 1 of the following:

- CMDT 6582 - Commodity Supply Chain Management
- CMDT 6682 - Trading in Commodity and Financial Markets
- CMDT 6802 - Foundations of Commodities
- ECON 5823 - Econometrics II
- ENTP 6824 - Entrepreneurial Financial Management
- FNCE 6340 - Business Firm Valuation
- FNCE 6350 - Financial Innovations
- FNCE 6360 - Management of Financial Institutions
- FNCE 6380 - Futures and Options *
- FNCE 6382 - Survey of Financial Derivatives *
- FNCE 6410 - Real Options and Decisions Under Uncertainty *

*FNCE 6380, FNCE 6382, or FNCE 6410 cannot be used toward specializations if taken in the Finance and Risk Management Core.

- FNCE 6411 - International Corporate Governance
- FNCE 6420 - Mergers and Acquisitions
- FNCE 6480 - Financial Modeling
- MATH 5351 - Actuarial Models
- MATH 5792 - Probabilistic Modeling
- RISK 6309 - Strategic Risk Management
- RISK 6409 - Employee Benefits and Workforce Risk Management
- RISK 6509 - Global Risk Management
- RISK 6800 - Special Topics: Cyber Risk Management & Cyber Warfare

There may be additional prerequisite courses for the ECON and/or MATH selections. Please check with those departments or the graduate advisors.

Economics Specialization

Finance and Risk Management Core (9 hours)

- BUSN 6640 - Financial Management

- FNCE 6330 - Investment Management Analysis
Select one of the following three FNCE courses:
- FNCE 6380 - Futures and Options
- FNCE 6382 - Survey of Financial Derivatives
- FNCE 6410 - Real Options and Decisions Under Uncertainty
- **Finance and Risk Management Electives** (6 hours)
Select any two FNCE/RISK courses numbered 6000 or higher.
- **Economics Core** (12 hours)
 - ECON 5073 - Microeconomic Theory
 - ECON 5083 - Macroeconomic Theory
 - ECON 5803 - Mathematical Economics
 - ECON 5813 - Econometrics I
- **Quantitative Elective** (3 hours)
Select one of the following courses:
 - ECON 5823 - Econometrics II
 - ECON 6801 - Advanced Mathematical Economics
 - MATH 5351 - Actuarial Models
 - MATH 5390 - Game Theory
 - MATH 5792 - Probabilistic Modeling

The Economics Specialization is a stand alone program which requires 30 credit hours

Total 30 credit hours

Global Energy Management MS

Program Advisor: Sarah Derdowski

Telephone: 303-315-8065

E-mail: Sarah.Derdowski@ucdenver.edu

Faculty

Professors/Instructors

Timothy Antoniuk, MDes, University of Alberta

William Ascher, PhD, Yale University

Stephen Brown, PhD, University of Maryland

Matthew Clarke, PhD, University of Calgary

William Fox, JD, Catholic University of America

Mean Husein, PhD, McGill University

Merrily Kaut, PhD, University of Colorado Denver

L. Ann Martin, PhD, University of Minnesota

The master of science in global energy management (GEM) prepares individuals for leadership careers in the energy industry. This degree is particularly appropriate for individuals seeking to advance their existing careers in the energy field. Prior work experience within the field is preferred, but not required. The program consists of two components: the core curriculum and the more advanced and specialized elective

courses. The MS GEM program requires the completion of the following core classes as well as four elective courses from the selection listed below.

Required Courses

- GEMM 6000 - 21st Century Global Energy Issues and Realities
- GEMM 6100 - Global Energy Economics
- GEMM 6200 - Environmental, Regulatory, Legal & Political Environment in the Energy Industry
- GEMM 6300 - Technical Aspects of Energy Science
- GEMM 6400 - Leadership and Decision Making in the Global Energy Environment
- GEMM 6500 - Energy Accounting in the Global Markets
- GEMM 6600 - Introduction To Financial Management In The Energy Industry
- GEMM 6410 - People Management in the Global Energy Environment

Choose four

Choose four of the following courses. These courses are taken during the last two terms of the program and are offered based on enrollment.

- GEMM 6210 - Energy and the Law: Property and Contracts
- GEMM 6430 - Organizational Behavior in the Energy Industry
- GEMM 6450 - Strategic Management of the Energy Industry
- GEMM 6460 - Integrated Information Management for Energy Firms
- GEMM 6470 - Energy Marketing and Communications
- GEMM 6610 - Advanced Financial Management in the Energy Industry
- GEMM 6620 - Energy Asset & Production Management for the Energy Industry
- GEMM 6630 - Commercialization Management of Renewable Energies

Prerequisites

Applicants that do not have a science- or energy-related field undergraduate degree or three-plus years experience in the industry are required to take two prerequisite courses as well as the GMAT.

The prerequisite courses include physical geology and introduction to physical engineering. These courses can be taken at any accredited university, but must be approved by a GEM team staff member before registering. Also the prerequisites may be taken prior or concurrently with GEMM 6000 and GEMM 6100.

Notes and Restrictions

The program is a cohort group, hybrid online, 18-month master of science degree program. As a cohort program, all students start together, progress together and graduate together. Students cannot take time out from the program once it starts and need to plan on remaining in the program for the full 18 months. If it becomes necessary to take a term off, students may not re-enroll until the next cohort group catches up to the point where the student originally dropped out, which is 6 months later. As a hybrid online program, professors and students meet in class face to face for four days (Fridays through Mondays) at the start of each 3-month term with the rest of the term completed online. Please note that the GEM degree program runs on a completely separate schedule from the normal semester terms of the Business School. Please

check the Business School Website for deadlines and dates of each GEM term. All GEMM courses are restricted to those students who have been admitted to the MS GEM program.

Dual Degrees

In order to participate in the dual degree options offered by the Business School, students in the GEM program must first complete their entire GEM degree before they can begin their second degree.

Graduate Teacher Education Program: Master of Arts in Education and Human Development with a concentration in Teaching in Diverse Contexts

Return to: School of Education & Human Development

Lawrence Street Center, 701
Campus Box 106
P.O. Box 173364
Denver, CO 80217-3364

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Website: www.ucdenver.edu/education

Graduate Teacher Education Program Overview

The Graduate Teacher Education is housed within the Education and Human Development Master of Arts degree with a concentration in Teaching in Diverse Contexts. The Graduate Teacher Education program prepares educators who are culturally affirming and responsive, collaborate closely with families and communities, and have the knowledge and skills to create engaging, relevant, and rigorous classroom communities where all students can achieve and grow. We work alongside our P-12 partner educators throughout the CU Denver Professional Development School Network comprised of over 20 urban schools across numerous districts in the Denver metro region. Teacher education students live the life of a teacher for an entire academic year while enrolled in the program through a series of residency internships in a professional development school. Ultimately our goal is that all teacher candidates--whether their emphasis is elementary, secondary, or special education-- have the unique knowledge and skills to positively impact urban and diverse schools and act with a sense of urgency to support equity in education for all children. The Graduate Teacher Education Program is a nationally accredited program that exceeds expectations.

Education Pathways

The graduate teacher education program at CU Denver is designed to allow individuals with a minimum of a bachelor's degree to seek a master's degree along with an initial Colorado teacher's license in the following areas:

- **Elementary Education** (K-6) (43 semester hours)
- **Secondary Education** (7-12) (36 semester hours)
 - o English

- o mathematics
- o science (general science, biology, earth science, physics, chemistry)
- o social studies
- o foreign language (Spanish, French)
- **Special Education Generalist** (Ages 5-21) (57 semester hours)
- **Dual General Education/Special Education** (60-67 semester hours)

Program Structure

The program admits teacher candidates in cohort groups that begin either in the summer or fall. The cohort model provides a unique learning community for candidates and engenders significant support for success. The program includes full time 1 - 1.5 year licensure plans for regular education and a 1.5 - 2 year full time option for initial special education and dual special education. Students enroll in course work at the university and clinical internships in one of CU Denver's professional development schools throughout the program. By enrolling in several courses and internships together, elementary, secondary, and special education teacher candidates are well prepared to support K-12 students with a wide range of diverse needs.

Once teacher candidates complete the licensure portion of the program, they are eligible to begin teaching. Candidates then complete the MA in Education and Human Development by taking one final three credit hour course. In addition, students have the option of pursuing an MA in Curriculum and Instruction in their choice of specialization (see MA Options below).

Clinical Experience in Professional Development Schools

While in the licensure portion of the program, teacher candidates intern in a professional development school for an entire academic year, gradually beginning with two days a week early on and increasing over time to five days per week by the end of the program. University courses are closely integrated with the sequence of clinical internship experiences providing teacher candidates with multiple opportunities to engage in the authentic work of teachers. Teacher candidates co-teach closely with practicing teachers in the school and gradually assume full responsibility for teaching by the end of the program. Elementary teacher candidates generally spend an entire academic year in a single partner elementary school, whereas secondary teacher candidates spend their internships in one of the partner middle schools and one of the partner high schools. Special education teacher candidates complete internships at multiple levels, P-12 due to the wide-span of their license that enables them to support students with special needs ages 5-21. The schools are located in several Denver metropolitan districts serving large populations of low-income and/or minority students, as well as a sizeable number of students for whom English is a second language and students with special needs. Each school is supported by a site professor from the university one day per week and by a master teacher, called a site coordinator, who supports teacher candidates through their academic year of internships.

Assessment

Both the coursework and the internship experiences have been created to align with the Colorado Teacher Quality Standards, as well as frameworks for culturally and linguistically responsive instruction and Universal Design for Learning. Students in all programs engage in a common set of learning opportunities and internship assessments. They also engage in Program Level Assessments at different stages of the

program. Colorado mandates that all teacher education programs be "performance based" in order to recommend candidates completing the program for licensure; thus all candidates in the Urban Community Teacher Education program must demonstrate proficiency in both the university-based coursework and their internships.

Programs of Study

Due to the complex nature of teacher preparation that is governed by state and national accreditation and legislative mandates that can change from year to year, please see current programs of study in the teacher education handbook.

Master's Degree Options

The Graduate Teacher Education Program views teacher education as an ongoing developmental process linking preservice, induction, and ongoing professional growth experiences. Upon completion of the licensure portion of the program, beginning teachers complete the MA in Education and Human Development with a concentration in Teaching in Diverse Contexts by taking one final three credit hour course.

Students may also pursue an MA in Curriculum & Instruction with multiple options to obtain specialized knowledge in specific areas of curriculum & instruction like Literacy & Language, Culturally & Linguistically Diverse Education, STEM, Special Education, and others. These options typically require 12-15 additional credits and can also be coupled with added endorsements from the Colorado Department of Education. Students should refer to the information for the Curriculum and Instruction program for specifics.

Requirements for Admission

Admission Deadline: March 1 for both summer and fall start dates

Graduate Teacher Education Information Sessions

All prospective teacher candidates are strongly encouraged to attend an information session before applying to the program. Information sessions are typically held both face-to-face and through online webinars lasting approximately 60-90 minutes (check the SEHD website for exact dates and times). An advisor will be available to review prospective students' transcript and provide pre-admission advising. To more effectively facilitate this process, please bring copies of all transcripts with you.

Prerequisite Content Review

Teacher licensure requires that all initial licensure candidates hold a degree or have sufficient content knowledge obtained through university coursework aligned to the licensure area the candidate will be teaching. A prerequisite content review of a candidate's bachelor's degree transcript is required to determine if the candidate meets the minimum requirements or will have to take additional prerequisite content courses.

Graduate Teacher Education Admission Requirements

- Minimum undergraduate cumulative GPA of 3.0

- Candidates with an undergraduate GPA less than 3.0 are required to take the GRE, with a combined score of 150 each on verbal and quantitative sections; or the Miller Analogies Test, with an average score of 400-600, before consideration to admittance.
- Verification of passing official scores for PLACE or PRAXIS content exam specific to their licensure area. Consult the Colorado Department of Education website for specific testing information
- A complete application which can be obtained online at www.ucdenver.edu/education which includes transcripts, essays, recommendations, and an interview.

Health Administration MS

Program Director: Errol L. Biggs

Telephone: 303-315-8851

E-mail: errol.biggs@ucdenver.edu

The goal of the master of science in health administration degree is to prepare students, who, after appropriate practical experience in responsible managerial positions, are capable of assuming positions as chief executive officers or senior administrators in complex, multi-service healthcare organizations or in organizations' purchasing health services.

The curriculum is a synthesis of management concepts and techniques that are applicable to any economic organization and tools that can be specifically applied to health and health services systems. The program emphasizes skills that heighten basic analytical and decision-making processes used by top-level managers in selecting broad strategies for the institutions and by junior managers in administering subunits of health care organizations. The faculty guide the students in their mastery of theoretical, conceptual and quantitative topics.

The program has enjoyed continuous accreditation by the Commission on Accreditation of Healthcare Management Education since 1970.

A. Common Body of Knowledge (CBK): (18 hours)

Advisor will evaluate transcript for possible waivers in the CBK.

- BUSN 6521 - Leading Individuals and Teams
- BUSN 6530 - Data Analysis for Managers
- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6630 - Management of Operations
- BUSN 6640 - Financial Management

B. Health Administration Core: (21 hours)

- BUSN 6541 - Legal and Ethical Environment of Business (Health Section)
- BUSN 6561 - Marketing Management (Health Section)
- BUSN 6621 - Applied Economics for Managers (Health Section)
- BUSN 6711 - Strategic Management (Health Section) *This course is intended to be taken in your last Spring semester.
- HLTH 6010 - Health Care Systems

- HLTH 6770 - Healthcare Quality and Outcomes
- HLTH 6911 - Health Field Studies *This course is intended to be taken in your last Spring semester. Pre-req: HLTH 6010 or consent of instructor, minimum 3.0 cumulative GPA.

C. Health Administration Information Technology Elective: (3 hours)

Select one of the following courses:

- HLTH 6071 - Introduction To Health Information Technology
 - HLTH 6072 - Management of Healthcare Information Technology
- Please note: 2nd Health Administration Information Technology course may be used as Health Administration elective

D. Health Administration Electives: (6 hours)

Select two of the following courses:

- ENTP 6801 - Building Biotechnology
 - ENTP 6848 - Leadership in New Ventures
 - HLTH 6740 - Profiles in Health Care
 - HLTH 6070 - International Health Policy and Management
 - HLTH 6075 - International Health Travel Study
- * Students can also select HLTH 6071 or HLTH 6072 if not used as a Health Administration Information Technology Elective.

Notes and Restrictions

Management Residency. A management residency is optional, but recommended for all students, especially those with limited health care experience. The faculty of the program provide assistance to students in securing the residency, as well as regular consultation during the residency period. Information on the full range of local, regional, and national residencies is available from the program director.

Length of Program. The didactic portion of the degree will take at least two academic years, since most HA courses are offered only once each year and many have prerequisites. Part-time study is facilitated by courses being scheduled for late afternoon and evening hours.

Historic Preservation MS

► Graduate School Rules apply to this program

Program Director: Christopher Koziol

Office: CU Denver Building, 3200

Telephone: 303-315-5874

E-mail: christopher.koziol@ucdenver.edu

The Master of Science in Historic Preservation (MSHP) is a 45 semester-hour program, usually completed in 15 or 18 months (three regular semesters and possibly part or all of one summer). It is designed to accommodate the background and needs of both those students with substantial experience and those new to the field. The course of study is for students seeking training in spatial, technical and design aspects of

the broader field; it encompasses architecture, cultural landscapes, preservation, planning, building technology, project management, documentation, interpretation and representation.

In a rapidly changing cultural, economic and professional environment, it is valuable to have an understanding of what is worth saving of the built environment. However, appreciation for the past alone is insufficient for making the informed and creative decisions expected and required of cutting-edge professionals. The desire to know can become the opportunity to lead. There is an increasingly urgent need in our professional community and in our society for the skills and knowledge that this effort requires and this degree offers.

As global economies change fewer resources are available for new buildings and we must adaptively reuse our existing structures. This trend will continue beyond short-term economic conditions, because it will always be a more sustainable practice to reuse existing buildings than to tear them down and harvest or manufacture new materials.

The College of Architecture and Planning, and the professional community that it serves, foresee a significant and permanent shift towards more adaptive reuse of existing buildings. The master of science in historic preservation is a program designed to prepare students for a true 21st Century career.

Historic preservationists come from a variety of backgrounds. Some are well-educated in the humanities and desire to increase their technical understanding. Those familiar with the social sciences might be seeking "real world" applications for their expertise. Many already with "first professional degrees" in design and planning disciplines, as well as the law and business, seek to deepen their competence in the vibrant and interesting professional niche of historic preservation.

Prerequisites

The master of science in historic preservation program is fully integrated into a college emphasizing design and graphic excellence. While HP students need not have fully developed skills in advance of matriculation we have found that students have benefited from some previous exposure to:

1. Mechanical drawing/sketching
2. CAD/BIM graphics
3. Graphics software such as Adobe Creative Suite

These competencies can be demonstrated by previous coursework or by portfolio-resume submission.

Should any of these competencies for an admitted student be judged insufficient by the faculty, the program director may require the student to gain supplemental instruction upon matriculation to the MSHP program. Any credit awarded for such supplemental work will not be counted toward the required number of credit hours for the degree.

Admissions

Application to the master of science in historic preservation program is open to all students holding the bachelor's (undergraduate) degree from an accredited college (or its equivalent from a foreign institution).

Materials Required

- A brief statement of interest (500 word max.)

- A compact portfolio (max. 15 pages 8.5" X 11") of writing samples, and optionally, graphic work and professional resume is strongly recommended.
- Submission of Graduate Record Exam (GRE) scores is recommended for applicants without evidence of prior successful graduate level accomplishment. [There is an expedited application procedure for current CU Denver students in another CAP masters program. Please inquire to the MS in historic preservation program director.]

Transfer Credit

Transfer credit of up to 12 semester hours (up to 15 semester hours for those seeking/holding a related master's degree from CU Denver) may be awarded for equivalent graduate (post-bachelor's) course work at the discretion of the program director and in keeping with CU Denver Graduate School rules. Students holding a master's degree in Architecture, Urban Planning or Landscape Architecture are typically awarded 12 to 15 semester hours of advanced standing.

Undergraduate Course Work

Undergraduate course work substantively equivalent to a MS HP required course may be accepted as a substitution for that course at the program director's discretion, but such substitution will not reduce the total number of semester hours required for the degree.

Program Requirements

The course of study is designed to accommodate the background and needs of both those students with substantial experience, and those new to the field. The curriculum is flexible but rigorous, requiring:

- 12 semester hours of core courses in preservation
- 6 hours in approved Design History courses
- 18 hours of electives
- 9 hours capstone requirement

Students enrolling full-time in the 45 semester hour curriculum typically complete the program in 3 or 4 semesters, or 18 months. However, course work other than the completion of the capstone requirement may be accomplished in a period of residency as short as 15 months. Students receiving significant transfer credit and those with a related degree may further reduce the time required for the MS degree in historic preservation.

Our program is compliant with National Council of Preservation Education Standards.

Required Core Courses

Core Preservation courses (choose at least 4):

- HIPR 6010 - Preservation Theory and Practice
- HIPR 6110 - Regionalisms & the Vernacular
- HIPR 6210 - Historic Buildings in Context
- HIPR 6310 - Documentation, Analysis, Representation
- HIPR 6410 - Urban Conservation: Context for Reuse

- HIPR 6510 - Building Conservation
- HIPR 6610 - Reading the City

Choose at least 2 approved Design History courses (offerings vary); some examples are:

- ARCH 6210 - History of American Architecture
- LDAR 5521 - History of Landscape Architecture
- LDAR 6686 - Special Topics: Landscape Architecture
- URBN 6640 - History of the City
- URPL 6350 - Form and Formation of Cities

Total: 18 Hours

Electives

Choose 18 semester hours total, at least 9 semester hours from one of the groups below. (All courses = 3 semester hours unless otherwise noted)

NOTE: HIPR prefix electives HIPR 6610 Reading the City, HIPR 6710 Working Landscapes, HIPR 6810 Preservation Workshop may be counted toward any of the elective concentrations.

- PUAD 5110 - Seminar in Nonprofit Management
- PUAD 5115 - Effective Grant Writing for Nonprofit and Public Sector Managers
- URBN 6642 - Design Policy
- URBN 6641 - Design Process
- PUAD 5625 - Local Government Management
- PUAD 5626 - Local Government Politics and Policy
- HIPR 6610 - Reading the City
- HIPR 6930 - Internship
- ARCH 6450 - Pre-Design

Or Non-Western Design history courses as available

History

- GEOG 5350 - Environment and Society in the American Past
- HIST 5236 - Colorado Mining and Railroads
- HIST 5240 - National Parks History
- HIST 5242 - Oral History
- HIST 5229 - Colorado Historic Places
- HIST 5243 - Public History Administration
- HIST 5228 - Western Art and Architecture
- HIST 5244 - Interpretation of History in Museums: Exhibits and Education
- HIST 5231 - History in Museums
- HIST 5810 - Special Topics
- HIST 5234 - Introduction to Public History
- HIST 5232 - Historic Preservation

Capstone Work

Choose either 1. Professional Project or 2. Thesis and additional requirements.

1. HIPR 6851 - Professional Project (3 semester hours)

Preceded by ARCH 6450 Pre-Design

AND

HIPR 6930 Internship

OR

Preceded by HIPR 6170 Preservation Design Studio

OR

Preceded by pre-approved travel education

2. HIPR 6951 - Thesis (6 semester hours)

Preceded by LDAR 6949 - Research Tools & Methods (3 semester hours)

Total: 9 hours

History MA

► Graduate School Rules apply to this program

The master of arts in history requires 37 semester hours (12 courses plus enrollment for one-credit hour in preparation for the Comprehensive Examination). Students who entered the program before fall 2015 have a 36-semester hour requirement and need only enroll for the additional one-credit hour Comprehensive Examination if they are not enrolled in anything else when they take that examination. Students applying for admission to the program should have some background in history, though not necessarily a BA in the subject. The department encourages applications from individuals of any age interested in resuming their education. Graduate students in history develop skills in critical thinking, writing and independent research. Our program prepares students for a wide variety of professions, including teaching, government service, museum and archive management and historic preservation, as well as further degree work in history, law, librarianship and business. The department expects that students graduating with an MA in history will master the following general skills for their degrees:

- The ability to pursue independent historical research projects
- The ability to analyze historiographical arguments
- The ability to analyze primary documents and develop arguments from them
- The ability to create bibliographies using archival, library, and Internet resources
- The ability to write in a variety of formats, including historiographical essays, book reviews, and research papers

Students will also master knowledge of the basic historical content of both their major and minor fields, and an understanding of the historiographies and historical methods in their major and minor fields.

Admission Requirements

- In addition to the general admission requirements of the Graduate School, the Department of History requires an undergraduate GPA of at least 3.25.
- All applicants to the history program must take the GRE. GRE scores form a part of the department's consideration of students' qualifications.
- Applicants are required to submit a sample of written work, usually a term paper or project of similar length.
- All applications must include three letters of recommendation, preferably from college or university faculty.
- Applicants should address any gaps, weaknesses, or special circumstances in their academic records in the statement of purpose portion of the application. In special circumstances, the department may modify its admission standards.

APPLICATION DEADLINES

April 1	Fall admission
October 1	Spring admission

Admission decisions are made by a graduate committee composed of the graduate advisor and faculty representing fields in U.S., European, global, and public history.

Graduate School Policies

All history MA students are subject to Graduate School policies related to graduate study, as well as to all relevant university policies. These policies cover such topics as time limits on degree completion, changing degree programs, incomplete grades, and more. Further information on these policies can be found in the Graduate School section of this online catalog.

Transfer Credits

With approval from the graduate advisor and the appropriate faculty, students may transfer up to nine graduate-level credits accrued before enrollment in the CU Denver MA history degree program, provided that they earned a grade of *B+* or better in these courses. Students must submit a syllabus for each course they wish to transfer, and faculty may require students to complete additional assignments to meet the expectations of the department. The department will not accept transfer of courses comparable to HIST 6013, Introduction to the Professional Study of History.

Grade Requirements

The history department requires that graduate students maintain a cumulative GPA of 3.0 and will not accept grades lower than *B-* (2.7) toward the completion of course work for the master's degree. Students who earn less than a *B-* in HIST 6013 must retake the class.

Residency Requirements

The history department requires a residency of at least one academic year for the degree.

Graduate Advising

Upon admission, students will sign a check list indicating their understanding and acceptance of the department's expectations. Early in their first semester, students should contact the history department graduate advisor to discuss their path through the program and to receive advice regarding the selection of major and minor fields.

Degree Tracking Responsibility

Although faculty will provide reasonable guidance, it is up to students to monitor their own progress through the program in consultation with the graduate advisor and their major advisor; this includes knowledge and understanding of application and graduate deadlines, degree requirements, comprehensive exam expectations and processes, thesis guidelines, etc.

Choosing Advisors and Fields of Study

All history MA candidates choose a major field and a minor field. Students will take courses in these fields (see Degree Requirements below) and will be tested in these fields (see Comprehensive Examinations). After consulting with the graduate advisor, students are responsible for securing two field advisors, one to oversee their progress in the major field, the other to oversee their minor field. All students should have chosen their fields and advisors by the end of the semester in which they have complete 12 credit hours. Students will also need a third advisor for the comprehensive examinations. This third advisor is typically in their major field and should always be consulted during preparation for the examinations.

Major Fields, Minor Fields, and Concentrations

The MA in history seeks to provide students with a balance of breadth and depth in the study of history. Major fields are broad areas of study within which students gain a general picture of historical processes. Concentrations provide focus for developing expertise within the major, either regionally or thematically. Minor fields provide a complementary or comparative area and must sit outside the major field. *[Please note that only the primary major field will be noted on the student's transcript; it will not include additional concentrations or minors.]*

Advisors and students together will work out Plans of Study, which indicate the courses students intend to take to meet their requirements, based on their selection of major and minor fields. *Students should make every effort to enroll in courses that best fit their major field, major concentration and minor field.*

Students can choose to major in one of the following four fields:

- European History
- Global History
- Public History
- U.S. History

The department has core readings for the Public History and US History fields. Students will draw on these readings for their comprehensive exams. Students working in all fields will coordinate their readings with their major and minor advisors.

Major Field Concentrations

Students work with advisors to select one of the major field concentrations listed below. Concentrations provide thematic or regional focus to a broad geographical or methodological major (e.g. for the global history major, students could concentrate on trade, borders, imperialism, etc.. or any of the areas of regional expertise of our faculty). Readings for the major field concentration are in addition to the core reading list. Note that students may select their concentrations and the options for minors from the same lists, below.

Minor Fields

Students can define their minor field as a specialization within one of the four major fields or as topics from the list of concentrations. Note that students may select their concentrations and the options for minors from the same lists, below.

Regional Concentrations/Minors

- American West
- Britain
- East Asia
- Germany
- Islamic World
- Latin America
- Western Europe

United States History Chronological Concentrations/Minors

- Colonial and Federal^[SEP]
- Nineteenth Century^[SEP]
- Twentieth Century

Public History Concentrations

- Historic Preservation^[SEP]
- Museum Studies^[SEP]
- State and Local History

Topical Concentrations/Minors-these can be regional or global and must be negotiated with your field advisors.

- Colonialism and Imperialism^[SEP]
- Cultural and Social History^[SEP]
- Diplomatic History and Foreign Policy^[SEP]
- Economic and Business History^[SEP]
- Environmental History^[SEP]
- Gender, Women and Sexuality^[SEP]
- Globalization^[SEP]
- Intellectual History^[SEP]

- Labor^[SEP] Nation and State^[SEP] Politics^[SEP]
- Race and Ethnicity^[SEP]
- Science, Medicine and Technology^[SEP]
- Urban History
- War and Revolution

Degree Requirements

All history MA students must have a major field and a minor field, and they must complete half of their course work at the 6000 level.

Required Introductory Course

- HIST 6013 - Introduction to the Professional Study of History

Total: 3 Hours

Major Field

Core Course in Major Field (3-6 semester hours)

Public history and U.S. history major fields require core courses covering major approaches and themes. The core courses familiarize students with the field in a broad sense.

Research Seminars (3-6 semester hours)

Research seminars focus on students' development of an original, primary research paper. One 3-semester-hour research seminar is required of all students. A second research seminar is required for students not in public history; the second 3 semester hours can be taken within the major or minor field.

Major Electives (9-12 semester hours)

Major electives are made up of courses in the major and concentration, including readings courses, that address specific field historiographies, and optional extended research credits. Students who choose to do a thesis may apply 6 thesis semester hours (HIST 6950) toward the major electives requirement.

Total: 18 Hours

Minor Field

Minor Electives

Minor electives are made up of courses in the minor field, including readings courses, which address specific field historiographies, or research seminars.

Total: 12 Semester Hours

Open Elective

Students may use the open elective to explore a course outside their major or minor or to do extra course work in one of their fields.

Total: 3 Hours

Degree Total: 37 Hours

INDEPENDENT STUDY AND/OR INTERNSHIP

Candidates may register for up to 6 hours of internships or independent study, only one of which may be at the 6000-level. Students will not be allowed to fulfill the research seminar requirement with an independent study or internship. Any independent study or internship at the 6000-level needs the permission of the graduate advisor. Students interested in pursuing an independent study or internship must find a faculty member willing to oversee their work, and they should expect the workload to equal or exceed that required for other courses at the same level.

- HIST 5840 - Independent Study: History
- HIST 6840 - Independent Study: HIST
- HIST 6939 - Internship

COMPREHENSIVE EXAMINATIONS

All history MA candidates must pass a comprehensive examination in the major and minor fields after the completion of course work and generally before embarking on a thesis, curriculum project or public history project. The comprehensive exam evaluates students' knowledge of their course work and their reading lists for their major, minor and concentration. The exam consists of a take-home written section, with broad essay questions in both the major and minor fields; this is followed by an oral exam with the student's faculty committee. In answering their exam questions, students are expected to construct arguments and to show mastery of the historiographies, narratives and historical content in their fields. The comprehensive exam is administered and evaluated by a committee of the major advisor, the minor advisor and an outside reader from the history faculty. Students should expect to read 80-100 books combined, as well as significant articles, in their major and minor fields. Beginning in fall 2015, students must enroll in HIST 6940, Comprehensive Examination, a one-credit requirement connected to faculty commitment to preparing students for their examination.

- HIST 6940 - Comprehensive Exam

Master's Degree Extended Research Options

The MA program in history offers a set of courses in which students can develop extended research interests. Students must select an advisor and develop a proposal for a specific research agenda in the semester before beginning work on a project.

REQUIRED PUBLIC HISTORY THESIS (HIST 6950) OR PROJECT (HIST 6952)

Students majoring in public history must complete either a thesis (6 semester hours) or a project (usually 3 semester hours).

OPTIONAL THESIS FOR STUDENTS IN U.S., GLOBAL AND EUROPEAN HISTORY (HIST 6950)

Students majoring in U.S., Global, or European history can choose to write a thesis (6 semester hours in their major field).

OPTIONAL ADVANCED HISTORY CURRICULUM DEVELOPMENT (HIST 6951)

Students who undertake their master's program when they are already teachers or who intend to become teachers can choose to construct curriculum projects relevant to their teaching practice. See the separate section below on "Opportunities for Teachers and Teachers-in-Training."

- HIST 6950 - Master's Thesis
- HIST 6951 - Masters Project: Advanced History Curriculum Development
- HIST 6952 - Master's Project: Public History

Thesis Requirements

Students writing theses are expected to develop an original research agenda resulting in an extended paper. Students work with their major field advisor, who will help guide them through the process of research and writing. Students will enroll for six credit hours in HIST 6950 over one or more semesters to complete their theses. Before registering for HIST 6950, students should have a thesis proposal and initial bibliography approved by their major advisor.

A thesis is evaluated by a committee of three faculty, including the major advisor and two other faculty members chosen by the student in consultation with the major advisor. Upon completion of the thesis, the student meets with the committee members, who ask questions about the research and conclusions which the student must defend. In most instances, the committee will require further revisions, sometimes major in scope, before the thesis is accepted and cleared for submission to the Graduate School in fulfillment of degree requirements.

Project Requirements

In lieu of a thesis, public history majors may choose to enroll in three credit hours of HIST 6952 to complete a public history project. Projects, which are usually conducted in collaboration with a public history organization, can entail creating an exhibit, organizing a museum or archival collection, conducting a preservation survey, or similar activities. Students are required to prepare an analytical paper describing the process and results of their project.

Opportunities for Teachers and Teachers-in-Training

Curriculum Projects

Licensed teachers and students who intend to become teachers may choose to complete a curriculum development project. Students arrange curriculum development projects with a sponsoring faculty member. Generally, students are expected to develop and submit a complete course curriculum plan for each 3-semester-hour project. Projects need to show evidence of familiarity with the relevant historiographies and primary sources. Students may apply the hours from HIST 6951 to either the major field or the minor field, depending on the project subjects. Curriculum plans must meet minimum criteria established by the history department in the document Advanced History Curriculum Development Projects.

- HIST 6951 - Masters Project: Advanced History Curriculum Development
(3 or 6 semester hours in their major field, or 3 semester hours in their major and possibly 3 semester hours in their minor, if a student elects to do a second project)

Secondary Teacher Licensure

Students interested in secondary teacher licensure should consult with the School of Education and Human Development. See the Urban Community Teacher Education Program for information.

Humanities MH

► Graduate School Rules apply to this program

Requirements for Admission

General rules for admission into the Graduate School apply to admission into the MH program in addition to the following:

- evidence of a bachelor's degree
- two official copies of transcripts from all community colleges, colleges, and universities attended
- overall GPA of at least 3.0 out of 4.0
- a writing sample
- three letters of recommendation (at least two from academic sources)
- appropriate undergraduate training or professional background, or indicators that supply evidence of ability to pursue the MH degree
- a typed statement specifying the goal of advanced study in the humanities expressed in clear, correct and effective English
- standardized test scores are not required, but will be considered if submitted

After meeting all other requirements for admission, applicants may be required to have an interview to discuss their interest in the program and their plans for study. For out-of-state applicants, an appropriate substitute for the interview may be determined by the director.

Provisional admission:

Applicants may be admitted as provisional-status graduate students if their complete record indicates a high probability of success.

Nondegree students:

Potential applicants may take CU Denver graduate-level courses as non-degree seeking students (unclassified student with a bachelor's degree) if they:

1. Wish to strengthen their record in order to demonstrate that they could successfully complete graduate-level courses in the program
- or-
2. Wish to start coursework toward the program prior to completing their application, with the understanding that taking courses does not guarantee admission.

Up to 12 semester hours of CU Denver graduate-level work taken as a nondegree student may be accepted by the program once a student has been admitted to the program (the 12-hour limit also includes graduate work from another university). For further information on non-degree graduate student status, see the Information for Graduate Students section of this catalog. In the case of CU Denver graduate students transferring to the MH program, previous course work may be accepted as appropriate to the MH plan of study.

International Students:

International students must also meet CU Denver requirements for international admission. See the Information for International Students section of this catalog or call 303-315-2230 for further information.

Degree Requirements

The Master of Humanities (MH) program is a 36-semester-hour program, of which 30 hours must meet all specifications of the Graduate School. Throughout their work toward the MH degree, students must maintain at least a *B* (3.0) average in all courses. A grade below *B-* will not be counted toward the degree.

Students may pursue a general MH degree or focus their studies and course work on one of two tracks: Philosophy and Theory OR Visual Studies or with the add-on of a Women's and Gender Studies Graduate Certificate. Each option is detailed below. All courses credited toward the MH degree must be taken at CU Denver (a maximum of 12 graduate semester hours may be transferred from other institutions after matriculating into the MH program, subject to the MH director's approval).

Each student's program is supervised by an MH faculty advisor. All independent study, project and thesis contracts must be approved in advance by one of the program directors. A total of two independent study courses, two 4000-level undergraduate courses, and one internship may count toward the degree. Only one graduate-level online course (up to 3 hours) may be taken toward the degree. The rest must be 5000-level or above courses offered through various university departments. All students must pass an oral comprehensive exam on the project or thesis in order to graduate.

General Master of Humanities Degree

Students pursuing the general MH degree have the opportunity to fashion a course of study based on their individual interests and goals. Students complete three required core courses and, in consultation with a faculty advisor, choose two or three academic disciplines as areas of concentration. Students who select a thesis (6 semester hours) will submit a thesis proposal after completing 30 hours of course work. In the case of a project (3 semester hours), students will submit a project proposal after 33 hours. All students culminate with the completion of a final project or thesis and an oral exam defense of the final work.

GENERAL MH REQUIREMENTS

Three Required Core seminars for the MH degree:

- HUMN 5025 - Methods & Texts of Interdisciplinary Humanities & Social Theory
(Must be taken during the first year of entrance into the program. **(Offered fall only.)**
Mid-Program Seminar, an interdisciplinary seminar which is approved for the student's program by the program director (note that the Mid-Program Seminar **must** have a HUMN prefix).

- HUMN 5924 - Directed Research and Reading in Interdisciplinary Humanities
A final seminar that provides background reading, theory and research approaches for students to develop a thesis or project; student must have completed at least 21-24 hours of course work and must register for the course via a schedule adjustment form with instructor approval. (**Offered spring only.**)

Total: 9 Hours

Electives

Additionally, students must complete a total of 21-24 semester hours comprising a coherent selection of courses from a variety of disciplines. All courses for the self-structured portion of the program must be selected with the approval of the MH program faculty advisor.

A total of two independent study courses and two 4000-level undergraduate courses taken when enrolled in the program may count toward the degree. All independent study contracts must be approved by the program director. The remaining course work must be 5000-level or above courses offered through various departments.

Students wishing to count credits accrued from a study abroad program while pursuing the MH must follow the rules of the Graduate School and must have approval of the program director in advance of studying abroad.

Students completing a project take 24 hours of electives, while thesis students complete 21 hours of electives.

Total: 21-24 Hours

Thesis or Project

A thesis (6 semester hours) or a final project (3 semester hours), which must include a substantial scholarly paper and may include a creative exercise involving at least two disciplines, must be completed at the end of the program. In order to proceed with a thesis or project, all students must submit to the program a proposal approved by their three faculty committee and the MH program director.

- HUMN 5950 - Master's Thesis
- HUMN 5960 - Master's Project

Total: 3-6 Hours

Oral Exam

An oral exam defending the project or thesis before a committee of three faculty members must be passed in order to graduate.

General MH Degree Total: 36 Hours

OPTIONAL MH TRACKS

Students may also focus in one of the tracks in the Master of Humanities program: Philosophy and Theory or Visual Studies. Tracks allow students to concentrate their studies in a more specifically defined field of interest. In addition to these tracks, MH students may also pursue a Women's and Gender Studies Graduate

Certificate in conjunction with the MH degree and/or one of its tracks. In addition to the three MH core required courses, students must fulfill the minimum track or graduate certificate requirements and must complete a total of 36 credit hours in order to complete the degree. These are detailed in the track descriptions that follow:

Philosophy and Theory Track

The philosophy and theory track in the Master of Humanities degree program offers students an interdisciplinary approach to studying philosophy, critical theory and related theories of criticism and analysis in various humanities disciplines. Students who pursue this concentration may focus their course work variously in philosophy, social theory, literary theory and criticism, cultural criticism, intellectual history and political theory. In this track, students develop analytic skills that allow them to integrate knowledge and modes of thinking that reflect the demands of critical inquiry.

By combining philosophical theory and critical thinking in one interdisciplinary track, students will be prepared to pursue advanced academic or professional degrees, secondary and higher education teaching, careers in art and literature, criticism, law, media and other careers with demand for critical thinking.

Beyond the required core MH courses (9 hours), a minimum of 21 credit hours in philosophy/theory-related work must be completed. This must include one required methodology course to be determined with the Master of Humanities advisor; 12-15 credit hours of philosophy/theory-related courses; and 3-6 hours of project or thesis work on a philosophy/theory-related topic.

TRACK REQUIREMENTS

Required Core MH Courses (See description above)

Total: 9 hours

Additional Requirements

- Philosophy/theory methods course (3 hours). Must be approved by the Master of Humanities Director or Associate Director
- Minimum of 12-15 credits of focused course work in philosophy/theory related courses (see suggested electives below)
- 3 credit project or 6 credit thesis on a visual studies topic, written in consultation with the required three person committee

Total: 21 hours

Visual Studies Track

The visual studies track in the Master of Humanities program offers students focused studies in disciplines that apply critical analysis to our visual world, such as art history, museum studies, film studies, new media studies and cultural studies. In a world whose work forces and creative citizenry are focused on the growth and use of visual technologies, visual literacy with sophisticated analytic skills is critical. Successful engagement with an image-driven and technological society necessitates an understanding of the use and encoding of imagery. The visual studies track provides students with the critical tools for engaging with advanced history, concepts and philosophies especially centered on visual culture, art history, visual communication studies, film studies and new media studies.

Areas of application for such studies include museum and cultural institutions, curatorial and research positions, arts administration, non-profit community-based organizations, advertising, promotion and marketing. The program is likewise relevant for students interested in pursuing doctoral work in related fields. Upon graduation, students will be prepared to enter the job market immediately, or they may use this track as a steppingstone toward a Ph.D. or another advanced degree.

Beyond the required core MH courses (9 hours), a minimum of 21 credit hours in visual studies-related work must be completed. This includes one 3-credit methodology course in visual studies, and 12-15 credit hours of visual studies-related courses; and 3-6 hours of project or thesis work on a visual studies-related topic.

TRACK REQUIREMENTS

Required Core MH Courses (see descriptions above)

Total: 9 hours

Additional Requirements

Visual studies methods course, chosen from the following list (substitutions must be approved by the Master of Humanities director or associate director). If not taken for the methods requirement, any of these may be taken as an elective.

ENGL 5420 - Film Theory and Criticism

FINE 5790 - Methods in Art History (Offered every fall)

HUMN 5660 - Visual Arts: Interpretations and Contexts (Offered every second or third semester)

- Minimum of 9-12 credits of focused course work in visual studies-related courses (see suggested electives below)
- 3 credit project or 6 credit thesis on a visual studies topic, written in consultation with the required three person committee

Total: 18 hours

Note: Students interested in pursuing doctoral work in related fields are strongly encouraged to develop foreign language competency in one or two of the following languages: French, German, Spanish, or a language related to the preferred area of study.

Information and Learning Technologies MA

Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Website: www.ucdenver.edu/education

Faculty

Information about Information ILT faculty is available online at www.ucdenver.edu/education.

Master's Degree

The Information and Learning Technologies (ILT) master's program helps people design and use various tools and media for learning, teaching, and professional leadership. Applying sound principles of learning, instructional and media design, and professional development, you will integrate a variety of learning strategies and technologies-such as digital media, eLearning, digital storytelling, social media and networking, games, and smart and mobile tools-into your educational responsibilities in school and workplace settings. Throughout the program you will engage in assessment and evaluation activities to improve services, be accountable for outcomes, and develop professional identities as thought leaders in your professional communities of practice.

The ILT master's program has three tracks from which to choose based on your professional goals:

- The Instructional Design and Adult Learning track prepares people to work in adult learning settings such as business, higher education, healthcare, nonprofits or government.
- The eLearning Design and Implementation track prepares people to teach and facilitate learning in eLearning environments and prepares people to develop online courses, experiences, and digital learning materials.
- The K-12 Teaching track helps teachers integrate technologies into schools and classrooms with a focus on supporting student learning and improving teaching practices. Licensed teachers may apply for an added endorsement in instructional technology through the Colorado Department of Education upon K-12 program and exam completion.

Technology Expectations

The ILT program uses computers and related technologies either as a focus of or a tool for learning, teaching, and professional development work. Students are expected to use their campus email accounts and check them frequently. Students need convenient, consistent, and reliable access to Internet-connected computers. In addition to textbooks, software purchases may be required or recommended for specific courses.

Program Requirements

Instructional Design and Adult Learning

In this track, you complete 30 graduate semester hours of coursework from a set of core courses and approved electives within the ILT program. This track is designed to help you develop skills for creating quality instructional materials and professional-learning experiences that help adult-learning audiences learn and perform better on the job; throughout the program, you will apply learning, instructional design (ID), and professional-development principles to the creation of digital and web resources, multimedia presentations, job aids, and online-learning modules. These skills are in high demand in corporate, healthcare, government, non-profit, and higher education settings. You will experience interactive learning, hands-on projects, and collaborative teamwork as you develop expertise in core ID skills: creating curriculum, evaluating program quality, encouraging innovation, and leading organizations toward productive change and growth. Like all ILT students, you will create an online portfolio--referred to as a base camp--that helps you establish your professional web presence and digital footprint as a thought leader and showcase your instructional-design accomplishments to employers and other professionals. The entire program takes about two years to complete.

Please consult the ILT Current Student Resources website for complete program requirements.

eLearning Design and Implementation

In this fully online track, you complete 30 graduate semester hours of coursework from a set of core courses and approved electives within the ILT program. The focus of this track is on the planning, design, development, delivery, facilitation and evaluation of digital and online learning resources, experiences, and programs for higher education, K-12, and professional-learning (corporate, healthcare, government, non-profit) audiences; throughout the program, you will apply learning, instructional and media design, and professional-development theory to the creation of digital and online instructional products and experiences. You will experience interactive learning, hands-on projects, and collaborative teamwork while learning to create quality eLearning products and experiences and while encouraging innovation and positive change within your workplace. You will create an online portfolio--referred to as a base camp--that helps you establish your professional web presence and digital footprint as a thought leader, showcase your accomplishments, and share your work with your professional communities of practice. The entire program takes about two years to complete.

Please consult the ILT Current Student Resources website for complete program requirements.

K-12 Teaching

Students in this ILT track may select a 30graduate semester hour MA and/or an endorsement program in instructional technology (24graduate semester hours). For the full Master of Arts degree, you complete coursework consisting of a required core and approved electives. Courses in the K-12 option focus on the practical needs of teachers in their integration of technology and on ways to give leadership and professional-development opportunities to your school and district. The plan of study is accredited by NCATE and AECT [SR1] and is designed in line with standards of the Colorado Department of Education. You will create an online portfolio--referred to as a base camp--that serves as a learning resource for your students, colleagues, and other professionals. Licensed teachers may complete an endorsement-only program in instructional technology consisting of 24 graduate semester hours. In addition to coursework, a passing score on the Instructional Technology PLACE content exam is also required to apply for the endorsement through the Colorado Department of Education.

Note: The courses in this program are fully online with exception of one blended-learning course. Please consult the ILT Current Student Resources website for complete program requirements.

Comprehensive Examination for all ILT Students

The comprehensive exam consists of a professional portfolio--referred to as a base camp--wherein students demonstrate program competencies through work products and related accomplishments. The base camp is created throughout the ILT program and submitted for faculty review during the final semester. For more information, see the ILT Current Student Resources website.

Information Systems MS

Program Director: Jahangir Karimi

Telephone: 303-315-8430

E-mail: Jahangir.Karimi@ucdenver.edu

The Master of Science in Information Systems (MSIS) program at the Business School meets industry needs by providing specializations. The program prepares students for career paths in systems

development and management services, enterprise application services, business intelligence, health information technology, information security audit and control, business consulting and development and consumer products and services. Whether students aim to be systems analysts or designers, software engineers, applications programmers, database administrators, Web developers, systems integrators, project managers, LAN administrators or application and technology consultants, the MSIS program provides the necessary knowledge and skills. This entire MS in Information Systems can be completed online.

The MSIS program offers a wide choice of courses. Candidates for the MS degree are not required to take a comprehensive examination or to complete a thesis in the major field.

Information Systems Specializations

The specializations for the MS in Information Systems are designed to provide the fundamental knowledge necessary for a career as an IS professional. The IS specializations provide students with a set of related courses necessary to acquire skills and expertise within a specific area in the development, management and use of information technology applications.

Accounting and Information Systems Audit and Control (AISAAC) Specialization

Recently, new regulatory environments have required companies to provide better documentation of their accounting and IT systems to improve the management and disclosure of their business processes for better financial and regulatory controls. Accounting and IT professionals have significant roles in audit and control activities, since they control the systems that monitor and report on finance, planning and operations. The courses within this specialization cover business-process management and financial controls; the emerging trends and practices in privacy and security; the strategies for integrating governance and compliance; and the IT organization's financial and business intelligence services. These courses will focus on how to leverage the existing IT infrastructure to establish quality in financial and internal audit processes and address the regulatory issues associated with reporting, consolidation and document/content management more effectively and completely.

Accounting Prerequisites: (6 hours)

Advisor will evaluate transcript for possible waiver of the prerequisites.

- BUSN 6550 - Analyzing and Interpreting Accounting Information
- ACCT 6030 - Financial Accounting

Information Systems AISAAC Course Requirements: (12 Hours)

- ISMG 6060 - Analysis, Modeling and Design
- ISMG 6080 - Database Management Systems
- ISMG 6180 - Information Systems Management and Strategy
- ISMG 6220 - Business Intelligence Systems and Analytics

AISAAC Common Course Requirements: (12 hours)

- ISMG 6040 - Business Process Management
- ISMG 6830 - IT Governance and Service Management

- ACCT 6020 - Auditing Theory
- ACCT 6510 - Accounting and Information Systems Processes and Controls
- OR**
- ISMG 6510 - Accounting and Information Systems Processes and Controls

AISAAC Electives: (6 hours)

Select two of the following courses:

- ACCT 6340 - Financial Statement Analysis
- ACCT 6360 - Fraud Examination
- ACCT 6470 - Internal Auditing
- ACCT 6620 - Advanced Auditing
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management

Business Intelligence Specialization

Business Intelligence (BI) systems combine operational data with analytical tools to present complex and competitive information to planners and decision makers. The objective is to improve the timeliness and quality of inputs to the decision process. BI is used to understand the capabilities available in the firm; the state-of-the-art, trends, and future directions in the markets, the technologies, and the regulatory environment in which the firm competes; and the actions of competitors and the implications of these actions. With this specialization, you get the necessary skills and knowledge in real-time data warehousing, data visualization, data mining, online analytical processing, customer relationships management, dashboards and scorecards, corporate performance management, expert and advanced intelligent systems, and hands-on experience with leading BI tools.

Business Intelligence Required Courses: (6 hours)

- ISMG 6080 - Database Management Systems
- ISMG 6220 - Business Intelligence Systems and Analytics

Business Intelligence Electives: (15 hours)

Select five of the following courses:

- ISMG 6180 - Information Systems Management and Strategy
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management
- ISMG 6470 - Text Data Analytics and Predictive Modeling
- ISMG 6480 - Data Warehouse and Administration
- ISMG 6810 - Business Intelligence in Healthcare
- ISMG 6820 - Business Intelligence and Financial Modeling
- ISMG 6830 - IT Governance and Service Management
- BANA 6660 - Predictive Modeling with Big Data

Information Systems Electives: (6 hours)

Any course numbered 6000 or higher with an ISMG prefix or an internship (by petition). Students pursuing an additional specialization in GIS should fill this requirement with CVEN 5381, CVEN 5382, CVEN 5383, CVEN 5384, CVEN 5385, or CVEN 5386.

Free Elective: (3 hours)

Any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with prefix of ACCT, BANA, CMDT, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, MTAX, or RISK.

*Students pursuing an additional specialization in GIS should fill this requirement with CVEN 5381, CVEN 5382, CVEN 5383, CVEN 5384, CVEN 5385, or CVEN 5386.

NOTE: Some of these courses have prerequisites of a BUSN course that may not be listed in your degree plan. Check with an academic advisor to see if it is possible to waive the prerequisite based on previous coursework.

Digital Health Entrepreneurship Specialization

Recently, the health care industry has shifted its focus from using proprietary and expensive IT solutions to more innovative IT applications in electronic health records (EHR) and other health information technology (HIT) innovations for sharing information effectively to help manage health care crisis. The courses within this specialization cover the evolving roles and importance of IT in the health care industry; the innovative IT applications for delivering health care with reduced cost and increased quality; the management of health care using effective IT systems; and the security and privacy issues associated with health information. These courses will focus on how IT-enabled health care organizations can integrate information from various resources in order to deliver innovative IT solutions to meet unique requirements of health care industry.

Information Technology Required Courses: (12 hours)

- ISMG 6060 - Analysis, Modeling and Design
- ISMG 6080 - Database Management Systems
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6320 - Innovative Health Information Technologies

Bio-innovation and Entrepreneurship Electives: (9 hours)

Select 3 of the following courses:

- ENTP 6801 - Building Biotechnology
- ENTP 6802 - Regulatory Environment of Life Science Innovation
- ENTP 6824 - Entrepreneurial Financial Management
- ENTP 6848 - Leadership in New Ventures

Health and Information Technology Electives: (9 hours)

Select 3 of the following courses:

- HLTH 6071 - Introduction To Health Information Technology
- HLTH 6072 - Management of Healthcare Information Technology
- ISMG 6020 - .Net Programming Fundamentals
- ISMG 6180 - Information Systems Management and Strategy
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6460 - Emerging Technologies
- ISMG 6810 - Business Intelligence in Healthcare

Enterprise Risk Management (ERM) Specialization

This specialization focuses on information technology as the primary driver of business strategy. Coursework focuses on the strategic, technological, financial and organizational issues involved with the effective management of information technology within an enterprise.

Prerequisites (6 hours)

Advisor will evaluate transcripts for possible waivers of the prerequisites.

- BUSN 6530 - Data Analysis for Managers
- BUSN 6620 - Applied Economics for Managers

Enterprise Risk Management Required Courses: (15 hours)

- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6640 - Financial Management
- ISMG 6180 - Information Systems Management and Strategy
- RISK 6809 - Principles of Risk Management & Insurance
- RISK 6909 - Corporate Risk Management

Enterprise Risk Management Electives: (15 hours)

Select five of the following courses:

- RISK 6129 - Practical Enterprise Risk Management
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management
- ISMG 6460 - Emerging Technologies
- ISMG 6820 - Business Intelligence and Financial Modeling
- ISMG 6830 - IT Governance and Service Management
- RISK 6509 - Global Risk Management
- RISK 6309 - Strategic Risk Management
- RISK 6800 - Special Topics: Cyber Risk Management & Cyber Warfare

Information Systems/Risk Management Elective: (3 hours)

Any course numbered 6000 or higher with an ISMG prefix or FNCE/RISK prefix or an internship (by petition).

Free Elective: (3 hours)

Select any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with a prefix of ACCT, BANA, CMDT, ENTP, FNCE, HLTH, INTB, ISMG, MGMT, MKTG, or RISK.

NOTE: Some of these courses have prerequisites of a BUSN course that may not be listed in your degree plan. Check with an academic advisor to see if it is possible to waive the prerequisite based on previous coursework.

Enterprise Technology Management (ETM) Specialization

This specialization focuses on information technology as the prime driver of business strategy. It focuses on the strategic, technological, financial and organizational issues involved with the effective management of information technology within an enterprise. The courses in this specialization cover the emerging technologies and the evolving roles and importance of IT in modern organizations; IT-enabled organizational processes and knowledge management; methods to develop, acquire and implement information systems; implementing and managing complex IT projects; security and privacy issues associated with IT.

Enterprise Technology Management Required Courses: (6 hours)

- ISMG 6040 - Business Process Management
- ISMG 6180 - Information Systems Management and Strategy

Enterprise Technology Management Electives: (15 hours)

Select five of the following courses:

- ISMG 6080 - Database Management Systems
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6220 - Business Intelligence Systems and Analytics
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management
- ISMG 6460 - Emerging Technologies
- ISMG 6830 - IT Governance and Service Management

Information Systems Electives: (6 hours)

Select two courses numbered 6000 or higher with an ISMG prefix or an internship.

*Students pursuing an additional specialization in GIS should fill this requirement with CVEN 5381, CVEN 5382, CVEN 5383, CVEN 5384, CVEN 5385, or CVEN 5386.

Free Elective (3 hours)

Any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with prefix of ACCT, BANA, ENTP, FNCE/RISK/CMDT, INTB, ISMG, MGMT, or MKTG.

*Students pursuing an additional specialization in GIS should fill this requirement with CVEN 5381, CVEN 5382, CVEN 5383, CVEN 5384, CVEN 5385, or CVEN 5386.

NOTE: Some of these courses have prerequisites of a BUSN course that may not be listed in your degree plan. Check with an academic advisor to see if it is possible to waive the prerequisite based on previous coursework.

Health Information Technology Management Specialization

Recently, the healthcare industry has shifted its focus from using proprietary and expensive IT solutions to more innovative IT applications in Electronic Health Records (EHR) and other Health Information Technology (HIT) innovations for sharing information effectively to help manage healthcare crisis. The courses within this specialization covers the evolving roles and importance of IT in healthcare industry; the innovative IT applications for delivering healthcare with reduced cost and increased quality; the management of healthcare using effective IT systems; and the security and privacy issues associated with health information. These courses will focus on how IT enabled health care organizations can integrate information from various resources, in order to deliver innovative IT solutions to meet unique requirements of health care industry.

Health Information Technology Required Courses (6 hours)

- ISMG 6060 - Analysis, Modeling and Design
- ISMG 6080 - Database Management Systems

Health Information Technology Electives: (15 hours)

Select five of the following courses:

- HLTH 6071 - Introduction To Health Information Technology
- HLTH 6072 - Management of Healthcare Information Technology
- ISMG 6220 - Business Intelligence Systems and Analytics
- ISMG 6320 - Innovative Health Information Technologies
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6810 - Business Intelligence in Healthcare

Information Systems Electives (6 hours)

Select any two courses numbered 6000 or higher with an ISMG prefix or an internship.

*Students in the Health IT specialization may also select a course numbered 6000 or higher with a HLTH prefix with approved petition (restricted enrollment).

Free Elective: (3 hours)

Any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with prefix of ACCT, BANA, CMTD, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, MTAX, or RISK.

Technology Innovation and Entrepreneurship (TIE) Specialization

Technological Innovation and Entrepreneurship Specialization is designed to prepare students for successful careers in innovation-related roles, allowing them to organize, develop, and commercialize information technology-based innovation in existing firms or to create new technology-based ventures. This specialization prepares students to evaluate opportunities and manage the process of innovation and builds the necessary knowledge and skills that enable leaders to seize market opportunities and drive strategic management and intelligent decision making. It includes courses in both Information Systems and Entrepreneurship and may also include an optional emphasis in Bio-innovation.

Technology Innovation and Entrepreneurship Required Courses: (12 hours)

- ENTP 6842 - New Concept Development
- ENTP 6020 - Business Model Development & Planning
- ENTP 6021 - Corporate Entrepreneurship
- ISMG 6460 - Emerging Technologies

TIE/Information Systems Electives: (18 hours)

Select 6 courses from the two elective lists below for a total of 18 hours.

Select 2 or 3 of the following Entrepreneurship electives:

- ENTP 6620 - New Venture Operations and Project Management
- ENTP 6822 - Legal and Ethical Issues of Entrepreneurship
- ENTP 6824 - Entrepreneurial Financial Management
- ENTP 6826 - International Entrepreneurship
- ENTP 6848 - Leadership in New Ventures

If two ENTP courses were selected above, select four of the following Information Systems electives; if three ENTP courses were selected above, select three of the following Information Systems electives:

- ISMG 6020 - .Net Programming Fundamentals
- ISMG 6060 - Analysis, Modeling and Design
- ISMG 6080 - Database Management Systems
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6180 - Information Systems Management and Strategy
- ISMG 6220 - Business Intelligence Systems and Analytics
- ISMG 6240 - Website Development Practice and Technologies
- ISMG 6450 - IT Project Management

Web and Mobile Computing Specialization

This specialization focuses on building and managing large systems using platforms for website development, mobile and wireless applications, and web services and service oriented architectures. The courses provide expertise in .Net programming, business process management, internet and mobile technologies, website development technologies, data warehousing and administration, and service oriented architecture. Project management coursework enables graduates to successfully handle highly, complex systems development projects in the business world.

Web and Mobile Computing Required Courses: (6 hours)

- ISMG 6060 - Analysis, Modeling and Design
- ISMG 6080 - Database Management Systems

Web and Mobile Computing Electives: (15 hours)

Select five of the following courses:

- ISMG 6020 - .Net Programming Fundamentals
- ISMG 6040 - Business Process Management
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6240 - Website Development Practice and Technologies
- ISMG 6450 - IT Project Management
- ISMG 6480 - Data Warehouse and Administration

Information Systems Elective: (6 hours)

Select any two courses numbered 6000 or higher with an ISMG prefix or an internship (by petition).

*Students pursuing an additional specialization in GIS should fill this requirement with CVEN 5381, CVEN 5382, CVEN 5383, CVEN 5384, CVEN 5385, or CVEN 5386.

Free Elective: (3 hours)

Any course numbered 6800 or higher with BUSN prefix or any course numbered 6000 or higher with prefix of ACCT, BANA, CMDT, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, MTAX, or RISK.

*Students pursuing an additional specialization in GIS should fill this requirement with CVEN 5381, CVEN 5382, CVEN 5383, CVEN 5384, CVEN 5385, or CVEN 5386.

NOTE: Some of these courses have prerequisites of a BUSN course that may not be listed in your degree plan. Check with an academic advisor to see if it is possible to waive the prerequisite based on previous coursework.

Geographic Information Systems (GIS) Option

The Geographic Information Systems option expands upon system development skills through the understanding of geographic information systems workflows, analysis processes, and data models. This option for the Business Intelligence, Enterprise Technology Management, OR Web and Mobile Computing specialization addresses how map representations can be abstracted in geo-databases to develop intelligent GIS systems. Learn how GIS can improve efficiencies, decision making, planning, geographic accountability, science-based plans and communication. The GIS option is offered in conjunction with the College of Engineering and Applied Science and a certificate in GIS is awarded by the College of Engineering and Applied Science.

Students must complete all requirements for the MS in Information Systems with a Business Intelligence, Enterprise Technology Management or Web and Mobile Computing Specialization, as well as the requirements below.

- CVEN 5381 - Introduction to Geographic Information Systems (Required)

Select 3 of the following courses:

- CVEN 5382 - GIS Spatial Database Development
- CVEN 5383 - GIS Analysis -- Theory and Practice
- CVEN 5384 - GIS Management and Policies
- CVEN 5385 - GIS Relational Database Systems
- CVEN 5386 - GIS Laboratory

Integrated Sciences MIS

► Graduate School Rules apply to this program

Program Requirements

The Master's program in Integrated Sciences (MIS) is designed to provide a broad-based, content-rich curriculum that integrates knowledge and methods from natural and physical sciences, mathematics, and computer science disciplines. MIS is a 30 semester-hour interdisciplinary program in which students take courses from two or three disciplines, identify a faculty mentor, and complete a Master's project or thesis. The signature aspect of the program is that the capstone experience must truly integrate the interdisciplinary content into a unified program of research.

Specifically, students are required to complete a coherent selection of classes in a minimum of two areas and a maximum of three areas within the disciplines of biology, chemistry, computer science, environmental sciences, geology, mathematics or physics. Each student must meet with the Program Director within the first semester of study to develop a program goal statement, which is used to guide his or her individualized curriculum. All classes applied toward the degree must be related to the student's stated program goal and receive prior approval for inclusion in the program of study by the Program Director.

With sufficient justification and with approval from the Program Director, students may take a maximum of 6 semester-hours outside of the program's areas of concentration. In addition, a maximum of 6 semester-hours of MINS independent study/internship coursework may be applied to the degree. All such contracts must be approved by the Program Director.

In accordance with Graduate School Rules, a minimum of 24 semester-hours must be at the graduate level (5000+). Under exceptional circumstances, up to 6 semester-hours may be taken at the 4000 level, with prior approval from the Program Director.

The student is responsible for insuring that all prerequisite requirements for the classes they take have been met, even if the prerequisite courses do not count toward the degree.

Graduate Advisor and Examination Committee

All candidates for the MIS degree must select a faculty advisor and two other faculty members to serve with the advisor as the candidate's graduate examination committee. The committee members must have graduate standing at the University of Colorado Denver and be approved by the Program Director. The name of the faculty advisor must be submitted to the Program Director no later than two semesters following admission to the program.

Core Requirement

Students are required to enroll in MINS 5200, Research Methods in Interdisciplinary Science, within their first year of the program. This course serves as an introduction to the program and helps students to develop research skills and to further their professional development. This course is offered in the fall semester only.

MINS 5200 Research Methods in Interdisciplinary Science

This course introduces methods used in interdisciplinary research in the physical and natural sciences, mathematics, and computer science and prepares students for developing research-based Master's project/thesis proposals. Topics include the scientific method and ethics, experimental design, data collection and analysis, literature searches, evaluation of scientific literature, scientific writing, and oral presentation. Prereq: Graduate Standing or Instructor Permission.

Concentration and Depth Requirements

The student must designate one area of concentration (the primary area of study) and one or two depth areas (the secondary and, if applicable, tertiary areas of study) within the disciplines of biology, chemistry, computer science, environmental sciences, geology, mathematics or physics. An interdisciplinary area of study (including but not limited to fields such as biochemistry, biophysics, or computational biology) may also be considered. The student must complete a minimum of nine semester hours in the chosen area of concentration and a minimum of six semester hours in each depth area.

Project or Thesis Requirement

The program provides students with two options as their capstone experience, either a project or a thesis, depending on their academic and professional goals. All students must conduct independent research integrating coursework from the disciplines in their program of study. The research is conducted as either a project (requiring 3-4 semester-hours of MINS 5960) or a thesis (requiring 4-6 semester-hours of MINS 5950), and is presented to their examination committee in both written and oral forms. The student must successfully defend their project/thesis in an oral examination (defense) in order to graduate. Prior to enrolling in Project or Thesis hours, all students must submit a proposal approved by three faculty members (one of whom is their graduate faculty advisor) and the Program Director.

- MINS 5950 - Master's Thesis
- MINS 5960 - Master's Project

Degree Total: 30 Hours

International Business MS

Program Director: Manuel G. Serapio, Jr.

Telephone: 303-315-8436

E-mail: Manuel.Serapio@ucdenver.edu

An MS in International Business (MSIB) from the University of Colorado Denver opens opportunities for dynamic careers in global business. MSIB students gain cutting-edge knowledge and skills to help them conduct business across borders.

Our innovative MSIB curriculum combines solid grounding in business foundations and knowledge of international business environments.

Our degree emphasizes action learning such as live case studies, international consulting projects and internships, and study-abroad trips.

The University of Colorado Denver is the only Colorado university, and one of just 17 universities nationwide, granted the U.S. Department of Education's prestigious designation as a Center for International Business Education Research (CIBER), an honor earned in large part through the excellence of the international business program.

The MS program in International Business requires the completion of the following:

Prerequisites: (3 hours)

Select 1 of the following courses: BUSN 6520, BUSN 6550, BUSN 6560, BUSN 6620, or BUSN 6640. Prerequisite choices should be based on course choices in the International Core courses and electives below. *(Advisors will evaluate transcripts for possible prerequisite waivers)*

Students who choose to take classes below that require prerequisites not previously met, may be required to take additional courses. Completion of prerequisite courses is in addition to the 30 hour MS in International Business. Meeting prerequisites is the responsibility of the student.

A. International Business Core: (6 hours)

- INTB 6000 - Introduction to International Business
- INTB 6200 - International Business Policy
- CAPSTONE COURSE - THIS COURSE IS INTENDED TO BE TAKEN NEAR THE END OF YOUR PROGRAM.

B. International Functional Core: (6 hours)

Select one course from the International Qualitative Requirement list below **and** select one course from the International Quantitative Requirement list below.

Select one course from the following International Qualitative Requirement list:

- ENTP 6826 - International Entrepreneurship
- INTB 6020 - Cross-Cultural Management
- INTB 6022 - International Business Negotiations
- INTB 6024 - International Trade Finance and Management
- INTB 6024 may be used to satisfy **either** the International Qualitative or Quantitative Requirement.
- INTB 6026 - International Marketing
- INTB 6040 - Managing Global Talent
- INTB 6094 - Marketing Issues in the Chinese Environment
- INTB 6500 - International Business Consulting

- INTB 6800 - Special Topics in International Business

Select one course from the International Quantitative Requirement list below:

- INTB 6370 - International Accounting
- INTB 6372 - International Financial Management
- INTB 6411 - International Corporate Governance
- INTB 6460 - Emerging Market Finance
- MTAX 6430 - International Taxation
- RISK 6800 - Special Topics: Cyber Risk Management & Cyber Warfare

D. International Elective: (15 hours)

Select any course numbered 6000 or higher with an INTB prefix **or** any graduate level business course that is cross-listed with an INTB prefix. May also select from the following: ACCT 6430 International Taxation, ENTP 6826 International Entrepreneurship, ENTP 6827 Global Action Projects for International Entrepreneurship or RISK 6800 Special Topics: Cyber Risk Management and Cyber Warfare. Travel study courses offered by the Business School also apply.

E. Free Elective: (3 hours)

Complete any graduate business BUSN course numbered 6800 or higher **OR** any graduate business course numbered 6000 or higher with a prefix of ACCT, BANA, CMDT, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, MTAX, or RISK. Note: students who require additional BUSN courses as prerequisites may petition to count one BUSN prerequisite course as a free elective. Please contact grad.advising@ucdenver.edu for the petition form.

Total 30 hours (plus any needed prerequisites)

Landscape Architecture MLA

Return to: College of Architecture and Planning

Prerequisites

Students are expected to have achieved a basic level of computer literacy prior to enrolling in the first semester of classes. The department offers a required graphics workshop for students who do not have a background in drawing or computer graphics. The workshop is scheduled each year prior to the beginning of fall semester.

Program Requirements

The landscape architecture program offers first professional and post-professional graduate courses leading to the degree master of landscape architecture (MLA). The program is fully accredited by the Landscape Architecture Accreditation Board (LAAB) and recognized by the Council of Educators in Landscape Architecture (CELA).

- The first-professional degree program requires a six-semester sequence of course work totaling 90 semester hours.
- The post-professional degree program is for qualified students who have already earned a first professional degree in landscape architecture (BLA) or related discipline. It requires a minimum of 60 semester hours. Advanced standing is based on prior academic accomplishment.
- Students completing the College of Architecture and Planning's BSArch degree or an undergraduate design degree at another institution may be given advanced standing in the three-year program. Advanced standing is based on prior academic accomplishment.

Course Sequence (First Professional Degree)

(90-semester-hour MLA for students without a professional degree in landscape architecture or related professional field)

The curriculum consists of core and elective course work. Core courses are grouped into five components:

	<i>Semester hours</i>
Design Studios	36
History and Theory	12
Site Works	12
Media	9
Critical Practice	6
<i>Total core courses</i>	75
MLA Electives	9
General Electives	6
<i>Total electives</i>	15
<i>Total courses</i>	90

Typical 90-semester-hour sequence of courses for the first professional MLA degree (subject to change)

First Year

Fall

- LDAR 5510 - Graphic Media in Landscape Architecture
- LDAR 5521 - History of Landscape Architecture

- LDAR 5540 - Introduction to GIS
- LDAR 5572 - Landscape Ecology
- LDAR 5500 - Introductory Landscape Architecture Design Studio

Total: 15 Hours

Spring

- LDAR 5502 - Landscape Architecture Design Studio 2
- LDAR 5532 - Landform Manipulation
- LDAR 6630 - Site, Society and Environment
- LDAR 6641 - Computer Applications in Landscape Architecture

Total: 15 Hours

Second Year

Fall

- LDAR 5503 - Landscape Architecture Design Studio 3
- LDAR 6620 - Landscape Architecture Theory and Criticism
- LDAR 6631 - Landscape Construction Materials and Methods
- LDAR 6670 - Plants in Design

Total: 15 Hours

Spring

- LDAR 6604 - Landscape Architecture Design Studio 4
- LDAR 6605 - Landscape Architecture Design Studio 5
- LDAR 6949 - Research Tools & Methods

Two electives. **Semester hours: 6**

Total: 15 Hours

Third Year

Fall

- LDAR 6606 - Landscape Architecture Design Studio 6
- Three Electives. **Semester hours: 9**

Total: 15 Hours

Spring

- LDAR 6607 - Landscape Architecture Design Studio 7
- LDAR 6608 - Landscape Architecture Design Studio 8
- LDAR 6750 - Professional Practice

Two Electives. **Semester hours:** 6

Total: 15 Hours

Course Sequence (Advanced Professional Degree)

(60-semester-hour MLA for students with a professional degree in landscape architecture or related disciplines)

The curriculum typically requires 60 semester hours and two years of full-time study. The core curriculum consists of three groups:

	<i>Semester Hours</i>
Design	24
History and Theory	12-15
Media	3-6
Electives	9-18
<i>Total courses</i>	60

The department chair or associate chair will advise each student engaged in this program of study.

Thesis

The graduate thesis in landscape architecture provides an opportunity for students to conduct independent research and design investigations that demonstrate their capacity for rigorous original thinking. The thesis is not required for graduation and not all students are approved to write a thesis. Choosing to pursue a thesis project constitutes a significant commitment to the endeavor; the topic must be chosen with care and thoughtfully and critically developed. Topics can explore material that has been previously unstudied, reinterpret existing material in a new light, or engage research and design practices in ways that strengthen and define the final project. For all theses, the research and products must meet the highest standards of academic excellence and contribute significantly to the discipline and/or profession.

Pursuing a thesis requires students to enroll in a three-course sequence for a maximum total of 12 semester hours. Students are required to formulate their research proposals two full semesters prior to their enrollment for the 6-semester-hour thesis, typically taken in lieu of the final studio. To proceed through the sequence, students must have completed and passed the research tools and methods class (LDAR 6940) and have secured departmental approval of the thesis proposal. The completion of the thesis is dependent on acceptance of the student's work by the faculty member acting as the thesis chair and by the committee. For work to be accepted it must meet the standards established by the University of Colorado Denver for graduate thesis projects.

Dual Degree and Certificate Options

Students may enroll in a dual degree program with architecture (MArch) or urban and regional planning (MURP).

Students also may be selected through an application process to participate in a dual degree MLA with Tongji University in Shanghai, China. A thesis is required for students participating in this program. Read more about this program on the department website.

A certificate in Geospatial Information Science (GIS) is also available to students interested in pursuing geospatial design.

Management and Organization MS

Program Director: Kenneth L. Bettenhausen

Telephone: 303-315-8425

E-mail: Kenneth.Bettenhausen@ucdenver.edu

The MS Management program prepares students for significant managerial responsibilities in the private and public sectors. Core course requirements provide students with an advanced understanding of how to manage interpersonal dynamics, effectively design organizations, implement planned change and organizational transformations and develop human resources. Students build on this foundation with any four electives in MGMT, ENTP or INTB, or with the courses that comprise one of the career-focused specializations.

The specializations include: business strategy, change and innovation, enterprise technology management, entrepreneurship and innovation, global management, leadership, managing human resources, managing for sustainability, sports and entertainment management and strategic management. These specializations will help students master the tools and knowledge to be successful in each focused competency.

The MS management and organization degree requirements are met by the following:

Management MS

Management and Organization Core: (12 hours)

- BUSN 6520 - Leading Individuals and Teams

- MGMT 6320 - Leading Organizational Change
- MGMT 6360 - Designing Effective Organizations
- MGMT 6380 - Managing People for Competitive Advantage

Management and Organization Electives or Specialization: (12 hours)

A student may select any four MGMT, INTB or ENTP elective courses or complete one of the Management specializations, all of which include four courses.

Specialization Options:

- Business Strategy
- Change and Innovation
- Enterprise Technology Management
- Entrepreneurship and Innovation
- Global Management
- Leadership
- Managing Human Resources
- Managing for Sustainability
- Sports and Entertainment Management
- Strategic Management

Business Strategy

Complete four of the following courses:

- ENTP 6021 - Corporate Entrepreneurship
 - ENTP 6826 - International Entrepreneurship
- OR**
- INTB 6200 - International Business Policy
 - INTB 6022 - International Business Negotiations
- Or:
- INTB 6500 - International Business Consulting
 - MKTG 6010 - Marketing Strategy, Evaluation and Development
 - MGMT 6610 - Business Strategy Lab
 - MGMT 6730 - Human Resources Management: Performance Management
 - MGMT 6803 - Visionary Leadership
- Your selection may include up to 2 of the following FNCE/RISK courses:
- FNCE 6310 - Financial Decisions and Policies
 - FNCE 6340 - Business Firm Valuation
 - FNCE 6410 - Real Options and Decisions Under Uncertainty
 - FNCE 6411 - International Corporate Governance
 - FNCE 6420 - Mergers and Acquisitions
 - FNCE 6480 - Financial Modeling
 - RISK 6909 - Corporate Risk Management

Change and Innovation

Select four of the following:

- MGMT 6730 - Human Resources Management: Performance Management
- MGMT 6803 - Visionary Leadership
- MGMT 6804 - Bargaining and Negotiation
- MGMT 6808 - Leadership Development
- May include up to 2 of the following courses:
- MGMT 6821 - Managing for Sustainability
- MGMT 6823 - The Sustainable Business Opportunity
- BUSN 6830 - Business and the Natural Environment

Enterprise Technology Management

Required course (may be completed as a Free Elective):

- ISMG 6180 - Information Systems Management and Strategy
- Select 3 of the following:
- ISMG 6120 - Internet and Mobile Technologies
- ISMG 6430 - Information Systems Security and Privacy
- ISMG 6450 - IT Project Management
- ISMG 6460 - Emerging Technologies
- ISMG 6830 - IT Governance and Service Management

Entrepreneurship and Innovation

Select 2 of the following courses:

- ENTP 6642 - Exploring Social Entrepreneurship
- ENTP 6807 - Small Business Marketing and Personal Branding
- ENTP 6824 - Entrepreneurial Financial Management
- ENTP 6826 - International Entrepreneurship
- ENTP 6834 - Entrepreneurial Marketing
- ENTP 6842 - New Concept Development
- ENTP 6620 - New Venture Operations and Project Management
- ENTP 6644 - Social Entrepreneurship in the Developing World
- ENTP 6800 - Special Topics in Entrepreneurship
- ENTP 6822 - Legal and Ethical Issues of Entrepreneurship
- ENTP 6838 - Real Estate for the Entrepreneur
- ENTP 6848 - Leadership in New Ventures

Select 1 of the following courses:

- ENTP 6020 - Business Model Development & Planning
- ENTP 6021 - Corporate Entrepreneurship

Select 1 of the following courses:

ENTP 6000 level course of your choice (excluding ENTP 6801 and 6802)
MGMT 6000 level course of your choice

Global Management

Required Courses:

- INTB 6000 - Introduction to International Business

- INTB 6020 - Cross-Cultural Management
 - INTB 6040 - Managing Global Talent
- OR**
- MGMT 6040 - Managing Global Talent
- Select 1 of the following:
Any INTB 6*** course or Travel Study Program (see advisor for details)

Leadership

- Select 4 of the following:
- MGMT 6803 - Visionary Leadership
 - MGMT 6804 - Bargaining and Negotiation
 - MGMT 6808 - Leadership Development
- May include up to 2 of the following courses:
- MGMT 6821 - Managing for Sustainability
 - MGMT 6822 - Business Ethics and Corporate Social Responsibility
 - MGMT 6823 - The Sustainable Business Opportunity
 - MGMT 6824 - Sustainable Business/CSR Field Study
 - BANA 6650 - Project Management
 - ENTP 6848 - Leadership in New Ventures
 - INTB 6000 - Introduction to International Business

Managing Human Resources

- Prerequisites (completion of BUSN 6530 is in addition to the 30 hour MS MGMT)
- BUSN 6530 - Data Analysis for Managers
 - MGMT 6380 - Managing People for Competitive Advantage Complete in core
- Select 4 of the following:
- BUSN 6540 - Legal and Ethical Environment of Business
 - MGMT 6040 - Managing Global Talent **OR**
 - INTB 6040 - Managing Global Talent
 - MGMT 6710 - Human Resources Management: Staffing
 - MGMT 6720 - Human Resources Management: Training
 - MGMT 6730 - Human Resources Management: Performance Management
 - MGMT 6740 - Human Resources Management: Compensation
 - MGMT 6750 - HRM: Investing in People: HR Analytics
 - MGMT 6808 - Leadership Development

Managing for Sustainability

- ACCT 6285 - Accounting and Finance for Sustainability
 - BUSN 6870 - Global Climate Change
- OR**
- INTB 6870 - Global Climate Change
 - ENTP 6642 - Exploring Social Entrepreneurship
 - ENTP 6644 - Social Entrepreneurship in the Developing World
 - ENTP 6808 - Practicum in Sustainable Business Research

- MGMT 6821 - Managing for Sustainability
- MGMT 6822 - Business Ethics and Corporate Social Responsibility
- MGMT 6823 - The Sustainable Business Opportunity
- MGMT 6824 - Sustainable Business/CSR Field Study
- BUSN 6830 - Business and the Natural Environment
*Independent Study/Internships by petition only
- MGMT 6840 - Independent Study
- MGMT 5939 - Internship
OR
- MKTG 5939 - Internship
- MKTG 6830 - Marketing & Global Sustainability
- BANA 6730 - Supply Chain Management

Sports and Entertainment Management

Select 4 of the following:

- MGMT 6830 - Sports and Entertainment Management
- MGMT 6832 - Law and Negotiation in the Sports/ Entertainment Industries
- BUSN 6860 - Finance in the Sports Entertainment Industries
- MKTG 6820 - Sports & Entertainment Marketing
- MGMT 6834 - London Calling: Global Sports and Entertainment Management
- MGMT 5939 - Internship (by petition only)

Strategic Management

Prerequisites (completion of prerequisites is in addition to the 30 hour MS MGMT):

- BUSN 6530 - Data Analysis for Managers
- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6620 - Applied Economics for Managers
- BUSN 6630 - Management of Operations

Required courses:

- BUSN 6560 - Marketing Management
- BUSN 6640 - Financial Management
- BUSN 6710 - Strategic Management
- MGMT 6803 - Visionary Leadership
OR
- MGMT 6808 - Leadership Development

Free Electives: (6 hours)

Any course numbered 6800 or higher with prefix of ACCT, BANA, BUSN, CMDT, ENTP, FNCE, INTB, ISMG, MGMT, MKTG, MTAX, or RISK. Enterprise Technology Management (ETM) specialization students must take at least one MGMT, ENTP or INTB course as a free elective. ETM specialization students must also complete the required course of ISMG 6180 as a free elective.

Marketing MS

Program Director: Vicki Lane
Telephone: 303-315-8468
E-mail: Vicki.Lane@ucdenver.edu

The MS in Marketing degree is designed to provide the skill sets necessary for you to succeed in middle (e.g., brand manager, advertising account executive) and upper level (e.g., CMO) positions in marketing and for those who interface with an organization's markets (e.g., customer service or operations).

Your MS in Marketing degree from the University of Colorado Denver consists of 30 hours:

- 21 semester hours of marketing core courses
- 9 semester hours of graduate electives

We highly recommend that one of the electives include a marketing-related internship, especially for those making a career change or without prior experience in marketing. You must complete the following 21 hours of marketing core courses and then you can choose from two paths to complete the remaining 9 hours. You can select the "build your own MS marketing degree" option or one of the specializations.

Required Courses: (21 hours)

- BUSN 6560 - Marketing Management
- MKTG 6010 - Marketing Strategy, Evaluation and Development
- MKTG 6020 - International Marketing
- MKTG 6040 - Services Marketing
- MKTG 6050 - Marketing Research
- MKTG 6060 - Buyer Behavior
- MKTG 6200 - Marketing Metrics and Dashboards

Marketing Electives or Specialization: (9 hours)

Students may select any course numbered 6000 or higher with a **MKTG** prefix **OR** students may choose from the marketing specializations.

The specializations are areas of focus that will appeal to those who have specific interests or are looking to apply their marketing acumen in particular contexts (e.g., interface with engineering or work in a multinational or nonprofit environment). A 3-semester-hour internship can be substituted for an elective in any area of specialization with the approval of the marketing program director.

Brand Management and Marketing Communications

Are you interested in a career in advertising, promotions or public relations? How about furthering your career in marketing management? Advertising, promotion and public relations managers are creative, highly-motivated individuals who are flexible yet can meet a deadline. They need good verbal and written communication skills and the ability to work well with people. Similar talents are needed by those involved with brand management. This task is central to all marketers, especially those involved with perceptual positioning and the deliverance of positions in a target market (e.g., those working in any phase of market communication and R&D) The U.S. Bureau of Labor Statistics reports that, because of the high visibility of these positions, these managers are often prime candidates for top C-level positions. The job outlook

remains promising but competition will be keen, and the best opportunities will go to those with an MS in marketing or an MS marketing /MBA dual degree. (Don't take our word for it, see <http://www.bls.gov/oco/ocos020.htm>).

Required:

- MKTG 6070 - Integrated Marketing Communications and Brand Identity
- Select 2 of the following courses:
- MKTG 6030 - Sales and Sales Force Management
 - MKTG 6090 - Customer Relationship Management
 - MKTG 6092 - Social Media Marketing
 - MKTG 6820 - Sports & Entertainment Marketing
 - MKTG 6830 - Marketing & Global Sustainability

Global Marketing

One of the growing themes of the 21st century economy is the growth of world trade. There is continuing demand for individuals who understand the how to conduct marketing across many different international environments as well as rapidly growing areas such as China and the emerging markets. This specialization prepares you to effectively compete and succeed in this environment.

Required Courses:

- MKTG 6094 - Marketing Issues in the Chinese Environment
 - MKTG 6830 - Marketing & Global Sustainability
- Select 1 of the following courses:
- ENTP 6826 - International Entrepreneurship
 - INTB 6020 - Cross-Cultural Management
 - INTB 6022 - International Business Negotiations
 - INTB 6200 - International Business Policy
 - MKTG 6700 - Marketing Travel Study

High-Tech/Entrepreneurial Marketing

The American economy was built on a spirit of innovation, hard work and entrepreneurship, and this is surely going to be the path that assures continued American dominance in the technology and business development fields. Most smart innovators know that, in addition to the financial and managerial aspects of a business, it is the marketing function that often makes the difference between success and failure. Whether your interest is in corporate intrapreneurship and the development of high-technology oriented innovations or individual entrepreneurship and the development of a small business with minimal funds, knowing how to create and implement appropriate marketing strategies is fundamental to achieving your goals. This specialization allows you to focus on the type of new business creation path that best suits your aspirations while greatly enhancing your endeavors probability of success. If you aspire to be the next Bill Gates, this is a "must take" degree path for you.

Required:

- ENTP 6842 - New Concept Development
- Select 2 of the following courses:
- MKTG 6030 - Sales and Sales Force Management
 - MKTG 6070 - Integrated Marketing Communications and Brand Identity

- MKTG 6092 - Social Media Marketing
- ENTP 6020 - Business Model Development & Planning
- ENTP 6021 - Corporate Entrepreneurship
- ENTP 6824 - Entrepreneurial Financial Management
- ENTP 6826 - International Entrepreneurship
- ENTP 6838 - Real Estate for the Entrepreneur

Marketing for Sustainability

The world has changed. More than ever, companies around the globe need to introduce smart, sustainable brands to lead the way into the future. The strong core of MS marketing courses will give you the skills to become an effective marketing manager, while the specialized set of sustainability courses will give you the knowledge to work toward a better tomorrow. The sustainability courses will focus on the triad of economic, environmental and social sustainable development.

Required:

- MKTG 6830 - Marketing & Global Sustainability
Select 2 of the following courses:
- ACCT 6285 - Accounting and Finance for Sustainability
- BANA 6730 - Supply Chain Management
- BUSN 6830 - Business and the Natural Environment
- INTB 6870 - Global Climate Change
- MGMT 6821 - Managing for Sustainability
- MGMT 6822 - Business Ethics and Corporate Social Responsibility

Marketing Research

Marketing and survey researchers gather information about what people think, measure customer satisfaction and repurchase intentions, help companies decide what goods and services to offer and at what price, and detect up-and-coming trends. Marketing researchers need good quantitative skills, strong analytical skills and a good understanding of marketing and buyer behavior. Many of our alumni got their starts in marketing research positions. According to the U.S. Bureau of Labor Statistics, employment is expected to grow faster than average with the best job opportunities for those with an MS marketing degree (Don't just take our word for it; check out <http://www.bls.gov/oco/ocos013.htm>).

Required:

- BANA 6610 - Statistics for Business Analytics
Select 2 of the following:
- BANA 6660 - Predictive Modeling with Big Data
- BANA 6720 - Simulation Modeling
- ISMG 6080 - Database Management Systems
- ISMG 6220 - Business Intelligence Systems and Analytics
- ISMG 6480 - Data Warehouse and Administration
- MKTG 6070 - Integrated Marketing Communications and Brand Identity
- MKTG 6090 - Customer Relationship Management

Social Media Marketing

Are you interested in a degree that blends Web development and application strategies with marketing? This, then, is the specialization for you. This specialization covers all aspects of Internet marketing including the functions associated with Web sites for marketing communication and customer support, one-to-one communication to many different receiving devices, marketing via social networks, consumer behavior insights based on offline and online data combination, inventory optimization through CRM-SCM integration, and a focus on ROI and associated performance metrics. With Internet marketing poised to take off globally, especially in developing countries where consumers may not have access to the latest products in local stores, this is indeed the wave of the future.

Required:

- MKTG 6092 - Social Media Marketing
Select 2 of the following courses:
- BANA 6610 - Statistics for Business Analytics
- BANA 6660 - Predictive Modeling with Big Data
- MKTG 6070 - Integrated Marketing Communications and Brand Identity
- MKTG 6090 - Customer Relationship Management
- ISMG 6080 - Database Management Systems
- ISMG 6240 - Website Development Practice and Technologies
- ISMG 6430 - Information Systems Security and Privacy

Sports and Entertainment Marketing

The sports business industry is one of the largest and fastest growing in the United States. Add to that the burgeoning music, film, theater, television, cable and other entertainment industries and you've got virtually limitless choices. Every one of those industries needs good marketers. The strong core of marketing courses in the MS marketing program will give you the skills you need to hit the ground running with the specialized courses to teach you how to tailor your skills to the unique needs of the sports and entertainment industries.

Required:

- MKTG 6820 - Sports & Entertainment Marketing
Select 2 of the following courses:
- MGMT 6832 - Law and Negotiation in the Sports/ Entertainment Industries
- MGMT 6830 - Sports and Entertainment Management
- MGMT 6834 - London Calling: Global Sports and Entertainment Management
- MKTG 6070 - Integrated Marketing Communications and Brand Identity

Master in Business Administration for Executives, MBA

Program Director: W. Scott Guthrie

Telephone: 303-623-1888 or 1-800-228-5778

The executive MBA program provides executive-level students with a broad, rigorous 21-month academic experience leading to the master of business administration degree. The program is designed for persons who hold managerial positions in the private and public sectors. It builds upon the knowledge and experience of these executives with a sophisticated, challenging curriculum that can be pursued simultaneously without career interruption.

The executive MBA program emphasizes strategic leadership; the organization in a complex, international environment; and the applied tools of management. Courses are taught through a variety of methods. Case studies, lectures and computer simulation are combined with research projects and other teaching methods to provide students with tools useful in their present positions and applicable to more advanced responsibilities as they progress in their management careers.

Each new session of the executive MBA program begins the last week of August. Classes meet for a full day, once a week, on alternating Fridays and Saturdays, making it possible for those who live outside the Denver area to participate.

Two courses are taken simultaneously throughout the program. The program is supplemented by an intensive orientation at the beginning and a two-day seminar at the conclusion of the first academic year. A second-year seminar is held at an international business center outside of North America.

Mathematics Education Master of Science in Education MSED

Return to: School of Education & Human Development

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Web site: www.ucdenver.edu/education

Faculty

Information about faculty is available online at www.ucdenver.edu/education

The MSED in mathematics education program incorporates courses in mathematical content, pedagogy and research. This approach will improve the student's knowledge of mathematics and enhance their ability to teach effectively at the K-12 level. The program arises from collaboration between the School of Education and Human Development (SEHD) and the Department of Mathematical and Statistical Sciences in the College of Liberal Arts and Sciences (CLAS). It interweaves both mathematics and education leading to a truly interdisciplinary program.

The MSED core courses provide a sound basis in mathematics education, curriculum theory, teacher inquiry, appreciation of diversity and philosophical foundations.

MSED Core - 15 credits

- MTED 5030 - Theories Of Mathematics Learning
- MTED 5040 - Mathematics Teaching - Theory and Practice
- MTED 5050 - Critique Of Mathematics Education Research
- MTED 5060 - Developmental Pathways In Students' Mathematical Thinking

12 credits

Plus

- RSEM 5080 - Research In Schools

Or

- RSEM 5120 - Introduction to Research Methods
3 credits

Mathematics Core - 15 Credits

Required Mathematics Core - Choose three courses in consultation with faculty advisor. Students may select 5000-level MATH, MCKE, MTED, or RSEM courses relevant to the grade-level with which the teacher works with approval from faculty advisor.

9 credits

Plus

Thesis Option: Required Course - SECE 5950 - Master's Thesis. 6 credits

Or

Non-Thesis Option: Elective Courses - Choose two courses relevant to the grade-level with which the teacher works in consultation with faculty advisor. **6 credits**

MSEd Total: 30 Hours

MBA/MS in Bioengineering

The Business School and the Department of Bioengineering offer this degree option for students admitted into the Bioengineering MS program and the MBA program. This dual degree is an excellent opportunity for students who are planning a career in industry or as an entrepreneur. Bioengineering students including those who create medical devices, often launch their own venture upon graduation or thereafter. Business skills, especially in the area of marketing, legal environments, finance and operations are critical to enhance the probability of venture success. A dual degree also opens up new doors with regard to career choice, either in business or in one's core field.

Mechanical Engineering MEng

► Graduate School Rules apply to this program

The master's of engineering (MEng) is an interdisciplinary degree program designed to meet the needs of those practicing engineers who wish to follow an integrated program of studies in engineering and allied subjects related to the individual student's professional work. Students can combine advanced engineering course work with graduate-level non-engineering courses such as business administration, environmental sciences, social sciences, biological sciences or public administration. There are also tracks in sports engineering and motorsports engineering.

Prospective students are required to present a well-defined objective in order to be admitted to the program. In consultation with faculty advisors, an academic program is developed to meet this objective.

An advisory committee will be appointed for each student by the department. The advisory committee that guides the student is responsible for approving the individual's degree program and admission to candidacy, and approves the student's written report and the awarding of the degree.

The requirements for admission are the same as those for the MS degree awarded through the College of Engineering and Applied Science. A minimum of 30 semester hours of academic work are required for the MEng degree. At least 15 of these hours must be at the 5000 level or above in mechanical engineering. A maximum of 12 semester hours may be taken outside of engineering. In addition to course work, a written report is required in the MEng program as a final project (3 semester hours). The report may be related to the student's professional work. The report will be of the same general quality as that required for the master of science thesis and must be defended orally. It may be based on work done for credit under independent study.

Mechanical Engineering MS

► Graduate School Rules apply to this program

Program Plans

For the master of science (MS) degree in mechanical engineering, students may choose between three plans with each plan totaling 30 semester hours.

- Plan I - Students following Plan I (thesis option) take 24 semester hours of formal course work plus 6 semester hours of thesis work.
- Plan II - Students following Plan II (project option) take 27 semester hours of formal course work plus a 3 semester hour final project requiring a report.
- Plan III - Students following Plan III (10-course option) take 30 semester hours of formal course work plus a final comprehensive exam.

Students following Plan I or Plan II must submit a proposal to their examination committee prior to the semester in which they register for their thesis or project semester hours, and the examination committee must approve the proposal for the thesis or project.

Program Options

Students in each of the plans may choose one of four options. In the first three options, the student may choose to specialize in thermal science, mechanics or biomechanics. The fourth option is the general mechanical engineering option.

- The **thermal science option** requires 12 semester hours of course work in analytical methods, numerical methods, fluid mechanics and thermodynamics. The student then selects 9 semester hours of course work in approved electives from a selection of thermal science electives.
- The **mechanics option** requires 12 semester hours of course work in analytical methods, numerical methods, elasticity and dynamics. The student then selects 9 semester hours of course work in approved electives from a selection of mechanics electives.
- The **biomechanics option** requires 31 credit hours to graduate. Please contact the mechanical engineering department or visit the biomechanics website for more information.
- The **general mechanical engineering option** requires the student to take 18 semester hours of required course work in analytical methods, numerical methods, fluid mechanics, thermodynamics, elasticity and dynamics.

After meeting the course requirements for any of the four options the student may select any mechanical engineering graduate course to complete the credit-hour requirements. The student may also take courses approved by an advisor outside of the mechanical engineering department.

Media Forensics Emphasis, Recording Arts MS

► Graduate School Rules apply to this program.

Program Overview

The Master of Science in Recording Arts emphasis in media forensics prepares students from various backgrounds for work in the field of forensic audio, video and image analysis, utilizing the state-of-the-art methods and technology necessary to fight crime in the digital age. Housed in the National Center for Media Forensics (NCMF), this program is unique in providing a hybrid format (online and onsite) graduate education in forensic multimedia analysis.

Students from related disciplines (media production, electrical engineering, forensics, computer science, etc.) are encouraged to apply, as this program enhances scientific inquiry while guiding students through a two-year cohort curriculum. The hybrid delivery format affords students the ability to work full-time while completing most of the program online with additional onsite study at the NCMF and its partner institutions. Classes are comprised of online self-guided lectures, interactive learning, discussion boards, reading responses and scheduled video conferencing. Onsite course work provides students with hands-on and practical experiences which augment and enrich the curriculum. Additionally, experiential learning activities include visits to regional crime labs and scientific conferences to understand the application of forensic media technology and laboratory procedures.

Courses lead students through three areas of study: foundational knowledge, core analyses and capstone experiences, which fully prepare students for research in forensic science and expert witness testimony. Digital media evidence acquisition through computer forensics applications is emphasized in an environment that fosters creativity and individual skills. The research thesis on a topic of the student's choosing is conducted under the advisement of the director and associate director of the NCMF with input from forensic professionals from around the world. The thesis is a topic of exploration throughout the program and serves to enhance a graduate's area of specialty as they prepare for work in private forensic practice, corporate research and development, academic research and teaching, or crime labs at the local, state and federal levels.

Note: The application process and requirements for the Master of Science in Recording Arts emphasis in media forensics (MSRA-MF) differ from those listed for the recording arts (MSRA) program.

MSRA Media Forensics Application

Admission to the MSRA-MF program is competitive. Admission decisions are made by committee and are based on the entirety of the applicant's submitted materials. Admission to the program is contingent upon:

- Formal documentation of an earned bachelor's degree in a related field. (International students must document an equivalent.) Undergraduate degrees from other disciplines will be considered with proper support from application components.

- Successful completion of the Graduate Record Exam (GRE) Revised General Test.
- For international students, submission of proof of English Language Proficiency. Please contact the Office of International Admissions website for more information.
- Strength of application components as they relate to:
 - o Scientific competency
 - o Writing skills
 - o Desire to work in the field of forensic media analysis
 - o Strength of academic/professional background
 - o Strength of references through letters of recommendation

Application Components

The application deadline is **April 1**. The program accepts students in the **fall** only. Required application components include:

- Graduate Application for Admission
- Application Fee
- Entrance Examinations: GRE (and TOEFL/IELTS or other evidence of English proficiency, if applicable)
- Official Transcripts
- Cover Letter
- Resume
- Three (3) Letters of Recommendation
- Two (2) Technical Writing Samples

Applications that do not include all of the requirements or that include partial components are considered incomplete and will not be reviewed.

International applicants are encouraged to visit the Office of International Admissions website for detailed information.

Refer to the National Center for Media Forensics MSRA-MF program website for detailed information and updates regarding the application process and requirements.

Curriculum

The MSRA-MF program comprises 33 semester hours of credit: 29 hours are required courses and 4 hours are thesis. All courses must be completed with a grade of B- (2.7) or better and students must maintain at least a 3.0 cumulative GPA. Grades of C+ (2.3) or lower, or a cumulative GPA below 3.0, will result in the student's dismissal from the program. Students are admitted to the program in the fall as a cohort and must follow the curriculum in sequence.

Curriculum and application requirements are subject to change. Refer to the National Center for Media Forensics MSRA-MF program website for up-to-date information regarding curriculum and application requirements.

Program Sequence

Fall - Year 1

MSRA 5014 - Research Practices in Media Forensics

MSRA 5124 - Forensic Science and Litigation

Spring - Year 1

MSRA 5054 - Experiential Lab

MSRA 5114 - Foundations in Media Forensics

MSRA 5144 - MATLAB Foundations

Summer - Year 1

MSRA 5134 - Computer Forensics

MSRA 5244 - Mobile Phone Forensics

Fall - Year 2

MSRA 5054 - Experiential Lab

MSRA 5214 - Forensic Audio Analysis

MSRA 5254 - MATLAB for Forensic Audio Analysis

Spring - Year 2

MSRA 5054 - Experiential Lab

MSRA 5224 - Forensic Video and Image Analysis

MSRA 5264 - MATLAB for Forensic Video and Image Analysis

Summer - Year 2

MSRA 5314 - Report Writing and Court Testimony

Summer - Year 2 (or later)

MSRA 6954 - Research Thesis in Media Forensics

Total: 33 Hours

New Directions, Political Science MA

► Graduate School Rules apply to this program.

Director: Kathryn Cheever
Telephone: 303-556-5950
E-mail: kathryn.cheever@ucdenver.edu

An alternative track of the political science MA program (Plan II) is offered off-campus through the Center for New Directions in Politics and Public Policy at Chaparral in Douglas County and on the Fort Lewis College campus in Durango. This politics and public policy track presents courses in an intensive weekend format. The emphasis on politics and the policy-making process relates to the ability of leaders to mobilize resources and achieve constituent goals consistent with the public interest. In this context, politics entails communication, and effective politics requires communication. In short, this emphasis on political awareness seeks to help participants utilize the political process as the "art of making what appears to be impossible, possible."

Degree Requirements

Students must complete a total of 30 graduate credit hours to complete the MA degree.

Core Courses

- PSCI 5014 - Seminar: American Politics
- PSCI 5085 - Comparative Governance: Environment and Society
- PSCI 5324 - Politics, Public Policy and Leadership
- PSCI 5457 - Seminar: American Political Thought
- PSCI 5468 - Research Methods in Political Science

Total: 15 Hours

Electives

In addition to the required core courses, students must take 15 credit hours of political science electives.

[*Note:* Previously earned graduate credit may be submitted for approval to satisfy up to nine hours of the supportive elective requirement. The elective courses offered may change from time to time based on needs, interests and other factors.]

Below are examples of electives taken by New Directions students:

- PSCI 5007 - Beyond Political Correctness
- PSCI 5009 - Politics of the Budgetary Process
- PSCI 5024 - State Politics: Focus on Colorado
- PSCI 5084 - Local Government and Administration
- PSCI 5274 - Conflict Resolution and Public Consent Building
- PSCI 5354 - Seminar: Environmental Politics and Policy
- PSCI 5374 - Public Priorities for the 21st Century
- PSCI 5414 - Organizational Change Agents
- PSCI 5644 - Ethical Responsibilities of Leaders

Total: 15 Hours

Project Requirement

All students are required to complete a 3-credit master's project under the direction of a faculty advisor. Registration is done using the Special Processing form, rather than online.

- PSCI 5960 - Master's Project

Total: 3 Hours

Major Total: 33 Hours

Common Course Outcomes

In addition to clearly stated subject outcomes, all courses will have a common set of outcomes related to the following areas which are considered critical in developing leadership capacities necessary to address the changing public priorities for the 21st century:

- Creativity and innovation
- Changing public priorities
- Political and social diversity
- Ethical accountability
- Deductive and inductive reasoning
- Applied use of appropriate technology
- Strategic planning and decision making
- Resolution of conflicts and public consent building
- Individual, organizational and cultural communication effectiveness

Location

All of the courses for the Denver-based programs are currently offered at the University Center at Chaparral, 20 miles south of downtown Denver. The University Center is located next to the Chaparral High School, just north of Lincoln Avenue at Chambers Road in Douglas County (15653 Brookstone Drive).

Courses for the Durango-based program are currently offered on the campus of Fort Lewis College

Course Format

All courses are offered in a weekend format that consists of two or three weekend sessions for a given course spread out over a two-month period. Three-weekend classes are held from 9:00 am to 4:00 pm on both Saturday and Sunday of each weekend session. Two-weekend classes meet from 5:00 until 9:00 p.m. on Friday evening and from 8:30 a.m. until 4:30 p.m. on Saturday and Sunday. In most cases, a student will

complete all of the two or three weekend sessions of one course before starting the weekend sessions for the next course. There is typically a 2-3 week break between semesters.

Certificate Program

The Center for New Directions MA program offers a certificate program as well, allowing students to focus their studies in a particular direction and to note that particular focus on their transcript. Students do not have to be seeking a full Master's degree to earn a certificate of completion through the certificate program.

For more information on the graduate certificate in Public Non-Profit and Community Leadership, click [here](#).

Political Science MA

- Graduate School Rules apply to this program

The Political Science Department offers a Master of Arts (MA) degree in Political Science with an emphasis on building academic and practical skills in key areas of the discipline. Research and teaching in the department centers on the major fields of American politics, comparative politics, international relations, political theory and public policy; however, the department also offers more specialized training in human rights, legal studies, gender politics, race and ethnic politics, European studies, indigenous politics and urban politics. Students pursuing the MA have the option of completing the traditional track or an alternative track centered on the study on politics, public policy and leadership. Students completing the alternative "politics and public policy" track take most courses in weekend, off-campus locations. Students completing either track have gone on to PhD programs across the country and work in a variety of areas, including; state and local elected office, government service, directors of community-based organizations and nongovernmental organizations, legislative analysts, UN affiliates, lobbyists, teachers, media analysis and political consulting.

Requirements for Admission

Students applying for admission to the MA program in political science should present at least 18 semester hours of previous academic work in political science, at least 9 hours of which should be at the upper-division or graduate level. The department may make exceptions to these requirements in unusual cases (for instance, if course work in related fields such as psychology, economics and history compensates for the deficiencies in political science). Applicants should present an undergraduate GPA of at least 3.0 to be considered. In their applications, students must submit transcripts and letters of recommendation (from academic sources) as specified by the Graduate School. In addition, applicants must submit a statement of academic objectives and an academic writing sample. Standardized test scores are not required of applicants, but will be considered if submitted.

In order to take graduate courses in political science, students must either be admitted to the MA program or secure permission as a non-degree student. Non-degree students may take up to 12 semester hours of graduate course work; however, they must first secure permission from the department graduate advisor to enroll in all graduate course work.

Degree Requirements

In addition to the requirements for admission and details of the program spelled out here, graduate students in political science must also abide by department rules and procedures specified in the Graduate School Rules. Failure to meet these policies may result in a student being dropped from the program.

Under the MA program in political science, two degree plans are available:

- Plan I requires the completion of nine graduate courses (27 semester hours) and a 6-credit thesis
- Plan II requires the completion of ten graduate courses (30 semester hours) and a 3-credit project.

Course work in both plans completed under the traditional track offered on the Downtown Campus must include:

PSCI 5000 - State of the Discipline

Additionally, at least one graduate seminar is required in each of the following areas: American politics, comparative politics or international relations, political theory and research methods.

Students will complete between 12 and 15 elective semester hours, depending on whether they are working under Plan I or II, which may be fulfilled through graduate course work in political science, related disciplines, independent study or internships. Ultimately, the total combination of independent study, graduate course work in related disciplines and internship cannot exceed 9 semester hours. With either plan, students are required to complete a minimum of 16 semester hours with the political science department at the University of Colorado Denver, and maintain a minimum *B* (3.0) overall GPA or better. Any course in which a student receives a final grade lower than B- cannot be counted toward the total credits for the Master's degree. Students who are on probation must meet regularly with the graduate advisor and must secure approval from the advisor for all course work while on probation.

Plan II is available both under the traditional MA track offered on the Denver campus, as well as through an alternative track offered off-campus through the Center for New Directions in Politics and Public Policy. For details about this off-campus track in politics and public policy, see New Directions, MA in Political Science.

The Political Science graduate program offers two transcribed certificates, allowing students to focus their studies in a particular direction and to note that particular focus on their transcript.

For more information on the graduate certificate in Democracy and Social Movements, [click here](#).

For more information on the graduate certificate in Public, Non-Profit and Community Leadership, [click here](#).

Public Administration MPA

Introduction

The Master of Public Administration degree (MPA) provides graduate professional education for students interested in public service leadership positions and careers with public and nonprofit agencies and organizations. The program serves students new to public service as well as those already in the field who are interested in furthering their careers.

Program Director: Christine Martell, PhD

Faculty

Professors:

Lloyd Burton, PhD, University of California, Berkeley
Angela Gover, PhD, University of Maryland
Mary Guy, PhD, University of South Carolina
Callie Rennison, PhD, University of Houston
Richard Stillman, PhD, Syracuse University
Paul Teske, PhD, Princeton University

Associate Professors:

Tanya Heikkila, PhD University of Arizona
Christine Martell, PhD, Indiana University
Danielle Varda, PhD, University of Colorado Denver
Allan Wallis, PhD, City University Graduate Center
Chris Weible, PhD, University of California, Davis

Assistant Professors:

Todd Ely, PhD, New York University
Benoy Jacob, PhD, University of Illinois at Chicago
John Ronquillo, PhD, University of Georgia

Wirth Chair in Sustainable Development:

Mark Safty, JD, University of Montana

Research Professor:

Stephen Block, PhD, University of Colorado

Assistant Research Professor:

Kelly Hupfeld, JD, Northwestern University

Clinical Professors:

Malcolm Goggin, PhD, Stanford University
Denise Scheberle, PhD, Colorado State University

Professor Emeritus:

John Buechner, PhD, University of Michigan

Dean Emerita:

Kathleen Beatty, PhD, Washington State University

Senior Instructor:

Wendy Bolyard, PhD, University of Central Florida
Pamela Medina, PhD, University of Central Florida
Robyn Mobbs, PhD, University of Colorado Denver

MPA AND MCJ-General Information

Admission Requirements

1. Applicants must have a baccalaureate degree from a college or university of accredited standing, with a minimum GPA of 3.0. Two sets of official transcripts are required from all higher education institutions attended.
2. Applicants must provide three recommendations from qualified references. Recommendations may be from professors, employers and/or others acquainted with the prospective student's professional and/or academic work.
3. Applicants are required to take the GRE, the GMAT or the LSAT unless they meet the requirements for waiver. Standard graduate admission test scores are normally waived when the candidate already has a graduate degree in another field from an accredited institution. Other applicants may have test scores waived if they have an undergraduate GPA of 3.0 or better *and* they have *significant* post-baccalaureate professional employment in management or policymaking positions for a minimum of 10 years or the equivalent.
4. A current resume highlighting professional accomplishments and community involvement, a short essay stating educational and career goals, a declaration of program form, and an application fee are also required.
5. International applicants may have different admission requirements and should check with the Office of International Affairs. In particular, international students whose first language is not English are required to take the TOEFL or IELTS. A composite score of 6.5 on the IELTS, or a composite score of 80 on the TOEFL, with accompanying minimum IELTS or TOEFL subscores of 20 or greater, is required.

All application material and test scores should be sent to SPA, University of Colorado Denver, Campus Box 142, P.O. Box 173364, Denver, CO 80217-3364.

SPA will review applications as soon as they are complete. Master-level applicants generally receive notification of their admission status three weeks after all materials have been received in the office. The preferred deadlines listed below allow students to receive best consideration for scholarships, financial aid and course selection. *Students who do not meet the preferred deadline may still submit application materials until approximately one month before the start of classes and will be considered on a space-available basis.*

Preferred Application Deadline

Fall - March 1
Spring - October 15
Summer - March 1

*Final Deadline**

Fall - August 1
Spring - December 1
Summer - May 1

*Final deadline does not apply to international students who should contact the Office of International Affairs for deadline information.

Provisional Admission

In exceptional cases, a student who does not otherwise meet the minimum requirements for admission may be admitted on provisional status if elements of their application suggest they may be able to succeed in the program. Students admitted on a provisional basis take two core courses in their first semester, and must earn at least a B in each course.

MCJ students may select two of the following for their first semester:

- CRJU 5001
- CRJU 5003
- 5002 or 5005

Based on their performance in these courses, a formal decision will be made concerning their admission into the program. Provisionally-admitted students may not take any other courses at SPA until they have been formally admitted to the program.

Nondegree Admissions

Students may register as nondegree students while developing their application packet. However, students are discouraged from taking multiple courses as a nondegree student if they hope to pursue a degree. No more than nine semester hours taken in the program as a nondegree student may be applied to the master's degree programs, with approval of an advisor. Taking courses as a nondegree student does not guarantee later admittance into the MCJ program. Nondegree student application forms are available in the Office of Admissions or online.

Transfer of Credit to SPA

Up to 9 semester hours of appropriate graduate work from an accredited college or university may transfer, if such credit was not applied to a completed degree.

Limitation of Course Load

The normal course load for a full-time MCJ student is 6 to 9 graduate credit hours per semester; full-time status for MCJ graduate students is 5 graduate credit hours per semester for financial aid determination. A student who is employed full-time is strongly advised not to carry more than 6 graduate semester hours in the MCJ program. Students who wish to carry a graduate course load above 9 hours per semester must consult their advisor and/or student service coordinator first.

Financial Assistance

Students in the master's degree programs are eligible for several types of financial assistance. Educational loans require application to the CU Denver Office of Financial Aid and completion of the FAFSA. A number of students secure internships or other part-time positions with local, state and federal agencies in the Denver metropolitan area. Scholarship assistance is available on a limited basis.

The school receives announcements for fellowships from various government organizations and actively seeks additional funding for student support in the form of internship positions and research assistantships.

Persons interested in applying for financial assistance should inquire in the SPA office. The deadline for current students is March 1 for the fall term. Prospective students seeking scholarship funds should have complete scholarship applications on file at the SPA office by the preferred application deadline for the semester they are requesting funds.

The Internship Program

An internship for the MPA and MCJ programs is required for students who have not had the equivalent of at least one year of professional full-time experience in the field, following the awarding of their Bachelor degree. The purpose of the internship is to continue the linkage between theory and practice that is the philosophical basis of SPA. Internships generally involve substantive part-time work undertaken during the course of one semester. A maximum of three semester hours will be awarded for internship service. Placements have included the Governor's Office, Colorado General Assembly, Denver Mayor's Office, City of Denver, Denver Police Department, Boulder Crime Lab, Western Governor's Association, the National Conference of State Legislatures, the Colorado Department of Public Health and Environment and the Denver Center for the Performing Arts.

Time Limit for Master's Degree

Master's degree students must complete all course work and degree requirements within seven years of registration in their first course.

MPA Degree Requirements

The minimum requirements for the basic MPA degree are outlined below. Occasionally, changes are made; students may graduate under the requirements that were in effect when they were admitted.

1. Graduate Course Work

All students must complete a minimum of 36 semester hours of graduate course work, with a cumulative GPA of B (3.0) or better. No more than 6 semester hours of independent study can be applied toward the degree. Students who have not had at least one year of professional work experience in the public or nonprofit sectors must complete an internship through an additional 3-semester-hour course described in No. 6 below, bringing their total semester-hour requirements to 39.

2. Core Courses

All MPA students (with the exception of those in the executive MPA option) must complete the following core courses or approved equivalents, for a total of 18 credit hours. Students must receive a grade of at least B- (2.7) in each core class. Students who earn a lower grade in a core class may repeat the class once in an effort to improve the grade.

- PUAD 5001 - Introduction to Public Administration and Public Service
- PUAD 5002 - Organizational Management and Behavior

- PUAD 5003 - Research and Analytic Methods
- PUAD 5004 - Economics and Public Finance
Or
- PUAD 5503 - Public Budgeting and Finance *Students in the Local Government Concentration must take PUAD 5503
- PUAD 5005 - The Policy Process and Democracy
- PUAD 5006 - Public Service Leadership
- PUAD 5008 - Evidence-Based Decision-Making

3. Electives

All MPA students must complete 12 hours of electives. Elective courses in which a student earns a grade of less than a C (2.0) will not be counted toward a degree.

4. Capstone Class

All MPA students, except those pursuing the thesis option, must complete the capstone course during the last semester of their degree program. All core courses must be completed before beginning the capstone.

- PUAD 5361 - Capstone Seminar

5. Thesis Option

The thesis option is available in lieu of PUAD 5361 for MPA students who have an interest in pursuing a topic in-depth or who are planning to pursue a career in research or academia. Students must receive approval from their faculty advisor or the MPA director to pursue the thesis option. The thesis is a six credit course that normally spans two semesters.

6. Internships

Students who have limited experience (generally defined as less than one year of experience) in public, nonprofit or relevant private-sector service must enroll in PUAD 6910, Field Study in Public Administration. The decision to require PUAD 6910 for a particular student is made by the faculty admissions committee or the student's faculty advisor upon the student's acceptance to the MPA program. A minimum of 300 hours of supervised work and study is required to earn 3 semester hours of credit. This requirement raises the total semester hours needed to earn the MPA degree to 39.

MPA Options

Concentrations and Graduate Certificates

All SPA concentrations are a total of 12 semester hours and may either be taken as part of the MPA program or as a stand-alone graduate certificate.

A student *may* choose to select one of the concentrations described below or may complete the MPA without a specified concentration. Students completing a concentration take their electives in the area of

their concentration, complete the advanced seminar project in the area of their concentration and are advised by faculty from the concentration. The concentrations and their particular required courses are:

Environmental Policy, Management and Law Concentration

Students take the two courses listed below, plus three electives approved by the concentration director:

- PUAD 5631 - Seminar in Environmental Politics and Policy
 - PUAD 5633 - Seminar in Natural Resource and Environmental Health Law
- Electives approved by advisor (2) (6 semester hours)

Total: 12 Hours

Local Government Concentration

Students take

- PUAD 5503 - Public Budgeting and Finance
- and at least two of the three courses listed below, plus electives approved by the concentration advisor:
- PUAD 5625 - Local Government Management
 - PUAD 5626 - Local Government Politics and Policy
 - PUAD 5628 - Urban Social Problems
- Electives approved by advisor (1-2) (3-6 semester hours)

Total: 12 Hours

Gender-Based Violence Concentration

Students take four specified courses.

- PUAD 5910 - Nature and Scope of Interpersonal Violence
- PUAD 5920 - The Psychology of Interpersonal Violence
- PUAD 5930 - Interpersonal Violence Law and Policy
- PUAD 5940 - Interpersonal Violence Leadership, Advocacy, and Social Change

Total: 12 Hours

Emergency Management and Homeland Security Concentration

Students must take two out of the three courses listed below as well as electives approved by the advisor. We recommend that students take all three courses if possible.

- GEOG 5230 - Hazard Mitigation and Vulnerability Assessment
 - PUAD 5650 - Public Policies for Homeland Security and Disasters
 - PUAD 5450 - Law of All-Hazards Management
- Electives approved by advisor (1 or 2) (3-6 semester hours)

Total: 12 Hours

The emergency management and homeland security concentration requires the completion of three electives chosen from a preapproved, multidisciplinary list of courses relevant to emergency management. Students may choose electives in one of three tracks: policy and management; spatial analysis, planning and quantitative assessment; or public safety, homeland security and justice.

Nonprofit Organizations Concentration

Students take two required courses as well as nonprofit electives approved by advisor.

- PUAD 5110 - Seminar in Nonprofit Management
- PUAD 5140 - Nonprofit Financial Management
- Other nonprofit courses (6 semester hours)

Total: 12 Hours

The Accelerated Cohort

The accelerated MPA is a fast-paced, full-time option that brings academically superior students together with a dedicated research and teaching faculty in the midst of the vibrant downtown Denver environment.

The accelerated option enables students to focus their energies in a concentrated program of study and earn a nationally accredited, 36-hour MPA in 12 months. (It is preferred that applicants have some knowledge of economics, statistics and political science.)

The accelerated option is priced at a flat fee, regardless of in-state or out-of-state student status, providing out-of-state students with substantial savings.

The students in the cohort enjoy a unique experience as they go through all classes in the MPA together, fostering a community of scholar-practitioners.

Students are admitted to the program in cohorts of approximately 20 participants. A new cohort starts each August. The cohort format helps to increase the opportunity to become acquainted with other graduate students and increases the opportunities for interaction between program participants and faculty.

The Executive Option

The School of Public Affairs currently offers an executive MPA option for senior level professionals in the nonprofit and public sectors. The Executive MPA option requires 30 semester hours of credit.

Initial Leadership Experience (3 credit hours):

All students will enroll in the Rocky Mountain Program, a SPA residential leadership program. This is a six-day seminar typically held in Breckenridge that brings together public and non-profit professionals from across the country to collaborate on current management issues while honing leadership skills. Federal employees may elect OPM's federal Management Assessment Seminar at either the Western or Eastern Management Development Centers in lieu of the Rocky Mountain Program. For more information about the OPM program option please see www.leadership.opm.gov.

Required Courses (15 credit hours):

All students are required to complete two courses (6 credits) held on the Denver campus in an intensive format (1-2 weeks). Students complete two additional core courses (6 credits) in either an online, weekend

intensive, or through the traditional campus based classroom setting. All students complete their program with a capstone project (3 credits). The capstone project allows students to synthesize the information learned during the program and put it into practice within a professional setting.

Elective Courses (12 credit hours):

In consultation with an advisor, students select elective courses that best meet their professional goals. These may be taken online or in the classroom. Students may complete up to 9 credits through the federal OPM Management Development Center provided they are approved for graduate credit by the American Council on Education.

Online Option

SPA provides a unique opportunity for students who live at a distance from the university to obtain a MPA degree.

Designed to serve students who are looking for a high-quality education, but who need an alternative to traditional classroom instruction, students may elect to do one or all of their courses online. This option allows students to complete the entire degree at a distance or to choose to come to campus for some courses while using an interactive online format for others. For both in-state and out-of-state online students, tuition is comparable to the rate charged to in-state students for courses that meet in the classroom. The nonprofit organization concentration is available online, and other concentrations are being added annually. As well, a variety of other electives leading to a general MPA degree are available online. Students in the executive option may also choose to do all SPA course work online.

Gender-Based Violence Cohort

The first graduate program of its kind in the nation, the University of Colorado Denver's MPA concentration in gender-based violence focuses on the management and policies surrounding gender-based violence, as well as grass-roots social justice work and best practices in this emerging field. Each fall, 10 to 20 students are accepted into the cohort program, allowing the participants to build a strong community of advocates and learners.

The program invites students from around the world to participate in a unique cohort program, which combines online courses with five intensive campus seminars spaced throughout the two-year program. Students may choose to take all courses in the classroom if they wish.

The cost of the gender-based violence concentration courses is the same for in-state and out-of-state students. Nonresident students pursuing the MPA with a concentration in gender-based violence may also qualify for reduced tuition through the Western Regional Graduate Program which covers 14 western states.

Public History, MA in History

► Graduate School Rules apply to this program.

The MA program in history offers graduate-level major and minor fields in public history. Public history is a field of study that applies historical methods to the public sphere. This graduate major requires a concentration, in either museum studies or historic preservation. Public history majors can minor in any

subspecialty the department currently offers. Students majoring in U.S., European or Global history can also minor in public history.

Admission Requirements-See History MA

Degree Requirements

Required Introductory Course

- HIST 6013 - Introduction to the Professional Study of History

Total: 3 Hours

Major Courses

- HIST 5234 - Introduction to Public History

Concentration Requirement (optional)

Students who choose to concentrate in museum studies or historic preservation must take either

- HIST 5231 - History in Museums
- -OR- HIST 5232 - Historic Preservation

Research Seminar (3 hours)

Research seminars focus on students' development of an original, primary research paper.

Major Electives (9-12 hours)

Electives are made up of courses in public history, which focus on methodology and practice and thesis or project credits. These courses include:

- HIST 5133 - Management of Material Culture and Museum Collections
- HIST 5228 - Western Art and Architecture
- HIST 5229 - Colorado Historic Places
- HIST 5240 - National Parks History
- HIST 5242 - Oral History
- HIST 5243 - Public History Administration
- HIST 5244 - Interpretation of History in Museums: Exhibits and Education
- HIST 5245 - Heritage Tourism
- HIST 6992 - Seminar: Colorado Studies

Total: 18 Hours

Minor Electives

Electives are made up of courses in the minor field, including readings courses, which address specific field historiographies, or research seminars.

Total: 12 Hours

Open Elective

Students may use the open elective to explore a course outside their major or minor or to do extra course work in one of their fields.

Total: 3 Hours

Total: 36 Hours

Independent Studies and/or Internships

Candidates may register for up to 6 hours of internships or independent study, only one of which may be at the 6000-level. Students will not be allowed to satisfy the research seminar requirement via independent study. *Any independent study or internship at the 6000-level needs the permission of the graduate advisor.* Students interested in pursuing an independent study or internship must find a faculty member willing to oversee their work, and they should expect the workload to equal or exceed that required for other courses at the same level.

- HIST 5840 - Independent Study: History
- HIST 6840 - Independent Study: HIST
- HIST 6939 - Internship

Comprehensive Examinations

All history MA candidates must pass a comprehensive examination in the major and minor fields after the completion of course work and before embarking on a thesis, curriculum project or public history project. The comprehensive exam evaluates students' knowledge of their course work and their reading lists for their major, minor and concentration. In answering their exam questions, students are expected to construct arguments and to show mastery of the historiographies, narratives and historical content in their fields. The comprehensive exam is administered and evaluated by a committee of the major advisor, the minor advisor and an outside reader from the history faculty.

Master's Degree Extended Research Options

The MA program in history offers a set of courses in which students can develop extended research interests. Students must select an advisor and develop a proposal for a specific research agenda in the semester before beginning work on a project.

REQUIRED PUBLIC HISTORY THESIS (HIST 6950) OR PROJECT (HIST 6952)

Students majoring in public history must complete either a thesis (6 semester hours) or a project (3 semester hours).

OPTIONAL ADVANCED HISTORY CURRICULUM DEVELOPMENT (HIST 6951)

Students who undertake their master's program when they are already teachers can choose to construct curriculum projects relevant to their teaching practice. See the separate section below on "Opportunities for Teachers and Teachers-in-Training."

- HIST 6950 - Master's Thesis
- HIST 6951 - Masters Project: Advanced History Curriculum Development
- HIST 6952 - Master's Project: Public History

Thesis Requirements

Students writing theses are expected to develop an original research agenda resulting in an extended paper. Students work with their major field advisor, who will help guide them through the process of research and writing. Students enroll for six credit hours in HIST 6950 to complete their theses. Before registering for HIST 6950, students must have a thesis proposal and initial bibliography approved by their advisor.

A thesis is evaluated by a committee of three, including the major advisor and two other faculty members chosen by the student in consultation with the major advisor. Upon completion of the thesis, the student meets with the committee members, who ask questions about the research and conclusions which the student must defend. In many instances, the committee will require further revisions, sometimes major in scope, before the thesis is accepted and cleared for submission to the Graduate School in fulfillment of degree requirements.

Project Requirements

In lieu of a thesis, public history majors may choose to enroll in one semester of HIST 6952 to complete a public history project. Projects, which are usually conducted in collaboration with a public history organization, can entail creating an exhibit, organizing a museum or archival collection, conducting a preservation survey or similar activities. Students are required to prepare a paper describing the process and results of their project.

- HIST 6952 - Master's Project: Public History

Opportunities for Teachers and Teachers-in-Training

Curriculum Projects

Licensed teachers and teachers-in-training enrolled in the history graduate program may choose to complete a curriculum development project. Students arrange curriculum development projects with a sponsoring faculty member. Generally, students are expected to develop and submit a complete course curriculum plan for this 3-semester-hour project. Projects need to show evidence of familiarity with the relevant historiographies and primary sources. Students may apply the credits from HIST 6951 to either the major field or the minor field, depending on the project subjects. Curriculum plans must meet minimum criteria established by the history department in the document Advanced History Curriculum Development Projects.

- HIST 6951 - Masters Project: Advanced History Curriculum Development
(3 semester hours in their major field or minor field)

Secondary Teacher Licensure

Students interested in secondary teacher licensure should consult with the School of Education and Human Development. See the Urban Teacher Education Program for information.

History MA

Recording Arts, Master of Science (MSRA)

- Graduate School Rules apply to this program.

Program Overview

Recording arts is a field that deals with all aspects of recorded music and sound, including mixing, mastering, production, MIDI sequencing, live sound reinforcement, and post-production for film and video. The program refines students' skills in sound recording, aesthetics, multi-track recording, analog and digital signal processing, automated mixing, synchronization, stereo and surround imaging, mastering and post-production.

The Master of Science in Recording Arts (MSRA) has the only pedagogy track in the nation. Pedagogy is synonymous with teaching, and the MSRA includes a survey of available resources for audio education. The curriculum offers an interdisciplinary approach, which can include physics, acoustics, engineering, music recording, psychoacoustics, multimedia, theatre and film/video. The program emphasizes design and development of new methods and materials.

This graduate degree is designed to:

- prepare students for audio careers in mass communications, education, music, multimedia and the entertainment industries.
- enhance advancement of professionals in their careers.
- prepare the music educators of the future.

In their final semester, students will create and defend a thesis or a portfolio.

- *Thesis* -- Written research
- *Portfolio* -- Research in conjunction with a recorded work. This could be a music recording, audio for video, or other media.

Graduate courses comprising the core of the program advance students' artistic, pedagogical, technical and problem-solving abilities. Elective courses allow each student to develop additional skills and knowledge in related areas, including surround sound, acoustics, studio design, digital signal processing and others.

The Department of Music & Entertainment Industry Studies encourages students from allied disciplines (music, physics, engineering, etc.) to apply. Students are not required to have their bachelor's in recording arts; the bachelor's degree can be from any discipline. Applicants can qualify for the MSRA program by having equivalent level preparation (e.g., work experience). Candidates without sufficient experience/training in recording arts may be required to take preparatory courses at the undergraduate level.

Note: The application process and requirements for the MSRA program differ from those listed for the media forensics emphasis.

MSRA Application Components

Admission to the MSRA program is competitive. Applications are accepted for fall-only admission to the cohort. Admission decisions are made by committee and are based on the entirety of the applicant's submitted materials. Incomplete applications are not considered, and application requirements may vary between domestic and international students.

- Graduate Application for Admission
- In-State Tuition Classification Application (if applicable)
- Application Fee
- Entrance Examinations: GRE (and TOEFL/IELTS or other evidence of English proficiency, if applicable)
- Official Transcripts
- Three (3) Letters of Recommendation
- Application Essay
- Resume
- Portfolio

Applications that do not include all of the requirements or that include partial components are considered incomplete and will not be reviewed.

International applicants are encouraged to visit the Office of International Admissions website for detailed information.

Refer to the MSRA website for deadlines, detailed information and updates regarding the application process and requirements.

Required Courses

- MSRA 5000 - Introduction to Graduate Studies
- MSRA 5001 - MSRA Research Seminar
- MSRA 5580 - Graduate Audio Seminar I
- MSRA 5590 - Graduate Audio Production
- MSRA 6510 - Graduate Audio Studies Pedagogy
- MSRA 6950 - Thesis in Professional Audio
or
- MSRA 6951 - Professional Audio Portfolio Thesis

Total: 19 Hours

Electives

Choose **15 semester hours** from the list below. Students may take courses not listed here upon approval of the faculty or academic advisor.

- MSRA 5500 - Topics in Professional Audio (spring)
- MSRA 5505 - Audio Post Production I (fall)
- MSRA 5530 - Live Sound Reinforcement (fall/spring)
- MSRA 5560 - Mastering & Advanced Digital Audio (spring)
- MSRA 5575 - Graduate Surround Sound (spring)
- MSRA 5605 - Audio Post Production II (spring)
- MSRA 5820 - Digital Music Techniques (fall)
- MSRA 5840 - Independent Study for MSRA (spring, fall, summer)

Program Total: 34 Hours

Students should plan to graduate in a minimum of four semesters. Students can apply for graduation in any semester (fall, spring or summer), provided they have completed the required course work. All course work must be completed with a satisfactory grade of "B" (3.0) or higher. Students should not register for thesis/portfolio unless approved by the faculty advisor.

Please refer to the MSRA website for additional information.

School Library and Instructional Leadership MA

Office: 999 18th St. Suite 144

Telephone: 720-639-9228

Fax: 303-315-6311

E-mail: cpe@ucdenver.edu

Website: <http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/MASTERS/SchoolLibrary/Pages/SchoolLibrary.aspx>

Faculty

Information about SLIL faculty is available online at

<http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/MASTERS/SchoolLibrary/Pages/SchoolLibrary.aspx> .

Program Overview

The school library and instructional leadership program within the ILT master's degree program is a nationally recognized NCATE-AASL revised and approved school library media education program that leads to the Colorado Department of Education endorsement for school libraries. The program integrates information literacy standards through the use of collaborative planning, as approved by the American Association of School Libraries. Technology and library resources are seen as tools to increase student achievement by integrating 21st Century Learning standards with the content standards of the classroom teacher. The program adheres to the constructivist theory of resource-based learning, teacher leadership, instructional coaching, and media literacy. The program believes that school librarians require education as a teacher as well as a librarian, as advocated by the American Library Association and the International Association of School Libraries. As a school librarian, you will provide collaborative instruction, information access and leadership through the management of your library program and the library resources. Courses are offered in a completely online program.

Once admitted, students begin a plan of study that typically takes about two years to complete. Consult the SLIL website for more information about specific plans of study, course offerings and expectations of cohort groups.

Admission Requirements

Admission decisions are based on undergraduate and graduate grades, external letters of recommendation and fit with the program as reflected in a letter of intent. In some cases, results of a test (GRE) are also

required. Prospective students should consult the SLIL program website for complete admission procedures and requirements.

Professional Expectations

All students in the SLIL program are expected to show a strong commitment to the program and to maintain high academic, professional and ethical standards. Inappropriate or unprofessional conduct is cause for discipline or dismissal from the program.

Technology Expectations

The SLIL program uses computers and related technologies either as a focus or a tool for learning. Students are expected to obtain an e-mail account and check it frequently. In addition to on-campus facilities, SLIL students need convenient access to Internet-connected computers off campus, either at their place of work or at home. In addition to textbooks, software purchases may be required or recommended for specific classes.

Program Requirements

School library students also have a choice between a school librarian endorsement-only for 24 graduate semester hours and a full master's program with a teacher-librarian endorsement. The master's program requires a minimum of 30 graduate semester hours. Students complete a plan of study consisting of courses and professional field experience. To receive Colorado teacher endorsement, students are required to pass the PLACE test in school library. This is a Colorado Department of Education requirement.

An Example of Two-Year Plan for School Library Program

Consult with your program and faculty advisor for a current example of a program plan of study.

Courses are offered only in certain semesters and courses should be taken in a particular sequence based on when you start the program. Advising is required prior to enrolling in a course, even as a non-degree student, in order to ensure the most effective course sequencing and availability of courses.

30 Credit MA Degree Plan of Study

Prefix: Course Title	Term offered:	Credits
SCHL 5100: School Libraries in the Digital Age	Fall	4
SCHL 5030: Information Literacy & Reference	Fall	3
SCHL 5160: Managing School Library Programs	Spring	3
RSEM 5080: Research for Teachers or INTE 6720: Research in Information and Learning Technologies	Spring	3

SCHL 5040: Information Storage & Utilization	Summer	2
SCHL 5200: Promoting Literacy through SL	Summer	3
SCHL 5913: School Library Field Experience	Fall	3
INTE 5300: Media Literacy and Maker Culture	Summer	3
INTE 6999: Leadership & Practice	Fall	3

ELECTIVE - CHOOSE ONE COURSE

One of our courses from our Online Learning Certificate program or our Teacher Leadership Certificate program	3
XXXX: Other Advisor-Approved Course from one of our certificate programs.	
ePortfolio completed for graduation	0
PLACE Test Passed (if seeking an endorsement in CO post-graduation)	0

Comprehensive Examination for All SLIL Students

The comprehensive exam consists of a professional portfolio where in students demonstrate program competencies through work products and related accomplishments. The portfolio is created throughout the student's program and submitted for faculty review the final semester. For more information, see the ILT website. For complete details about the SLIL program and endorsement requirements, see the SCHL website.

School Psychology PsyD

Return to: School of Education & Human Development

- Degree
- Admission Requirements

Program Leader: Franci Crepeau-Hobson

Office: Lawrence Street Center, 1113

Phone: 303-315-6315

Fax: 303-315-6349

E-mail: franci.crepeau-hobson@ucdenver.edu

Website: www.ucdenver.edu/education/spsy

Faculty

Information about faculty in the school psychology program is available online at www.ucdenver.edu/education.

Degree

The doctor of psychology (PsyD) degree in school psychology is a 96 graduate semester-hour program that leads to licensure as a school psychologist by the Colorado Department of Education and prepares graduates to apply for licensure by the Colorado State Board of Psychologist Examiners.

The program is based on the *Accreditation Domains and Standards* of the American Psychological Association (APA) and the *Model for Comprehensive and Integrated School Psychological Services* endorsed by the National Association of School Psychologists (NASP). This model and these standards promote the following domains of psychology: data-based decision-making and accountability; consultation and collaboration; interventions and mental health services to develop social and life skills; school-wide practices to promote learning; preventative and responses services; family-school collaboration services; diversity in development and learning; biological bases of behavior; research and program evaluation; and legal, ethical and professional practice.

Consistent with a practitioner-scholar model, the PsyD Program in School Psychology prepares professional school psychologists through rigorous academic study integrated with intensive supervised clinical practice. The Program includes an emphasis on the delivery of mental health services in schools, as well as the development of advanced level practice skills. The Program stresses the application of scholarly findings to practice, as well as a respect for all aspects of diversity.

Bilingual School Psychologist Concentration Option

This optional specialization provides School Psychology students with the knowledge and skills to effectively serve English language learners in the school setting. In addition to the three required courses and practicum component, the Bilingual School Psychologist concentration consists of language proficiency assessments to ensure that school psychologists are adequately proficient in another language to provide psychoeducational services. CU Denver provides one of the few bilingual school psychology concentration areas in the country making our graduates even more desirable in their future endeavors.

Admission Requirements

Successful applicants to the school psychology (SPSY) program will have obtained a minimum 3.0 undergraduate GPA and a combined score of at least 300 on the verbal and quantitative sections of the Graduate Record Exam (GRE) and a minimum score of a 3.5 on the written portion of the GRE. Applicants will also submit a current resume or vita, a personal statement that outlines their reasons for pursuing a degree in school psychology at CU Denver, and three letters of recommendation. The highest ranked applicants will be invited to a full-day group interview that includes a program orientation, a writing assignment, and a campus tour.

Application materials are available at

https://soa.prod.cu.edu/degreeprog/applyDEGREEPROG_CUDEN/login.action. All materials must be submitted online by December 1 for fall semester admissions. Application materials include the following:

- part I of the application for admissions
- tuition classification form
- \$50 application fee (make checks payable to the University of Colorado Denver)
- letter of intent/personal statement
- resume or vita
- three letters of recommendation

- two official transcripts from each higher education institution attended (in the original, sealed envelope)
- official GRE scores sent directly to the University of Colorado Denver
- oath and consent
- fingerprint affidavit

Requirements for the Doctor of Psychology Degree in School Psychology and Licensure

Students will complete course work in learning and cognition, academic interventions, legal and professional issues, psychological assessment, crisis intervention, counseling and other direct interventions, and consultation. Specific course requirements include three prerequisite courses, 71 credit hours of coursework, 7 credit hours of practica (minimum of 500 hours in the field), 6 credit hours of clinical externship (minimum of 500 clock hours in the field), 8 credit hours of internship (minimum of 1500 clock hours in the field), and 4 capstone project credit hours. Successful completion of the School Psychology Praxis exam during the course of study and passing of comprehensive examinations are also required. Prerequisites include an undergraduate or graduate course in each of the following: measurement concepts, basic statistics, and child development. Students may be admitted to the program without first completing these prerequisites; however, these courses must be completed during the first year of study.

Program Requirements

Students will complete the following core course work:

- COUN 5010 - Counseling Theories
- EDHD 5240 - Cognition and Instruction
- PSYC 7220 - Advanced Biological Bases of Behavior
- PSYC 7511 - Historical and Philosophical Foundations of Psychology
- PSYC 8550 - Advanced Social Psychology
- RSEM 6100 - Methods of Qualitative Inquiry
- RSEM 7050 - Methods of Survey Research
- RSEM 7110 - Intermediate Statistics
- RSEM 7210 - Program Evaluation
- SPSY 5600 - Behavior Analysis and Intervention
- SPSY 5900 - School-Based Multicultural Interventions
- SPSY 6100 - School Psychology: Professional and Legal Foundations
- SPSY 6150 - Psychoeducational Assessment I
- SPSY 6160 - Psychoeducational Assessment II
- SPSY 6170 - Assessment and Intervention: Birth to 3
- SPSY 6350 - School-Based Interventions: Children, Youth and Families
- SPSY 6400 - School-Based Interventions: Groups, Classrooms and Systems
- SPSY 6410 - Psychoeducational Assessment of Culturally and Linguistically Diverse Students
- SPSY 6420 - Crisis Prevention, Planning and Intervention
- SPSY 6450 - School-Based Consultation for Mental Health Professionals
- SPSY 6500 - Identifying and Planning for the Mental Health Needs of Children and Adolescents
- SPSY 6550 - Academic Interventions in School Psychology
- SPSY 6700 - Advanced Seminar in School Psychology
- SPSY 7980 - Clinical Supervision and Administration of Psychological Services

Supervised Experiences

- SPSY 6911 - School Psychology Practicum
- SPSY 6917 - Advanced Practicum in Psychological Assessment
- SPSY 6918 - Clinical Externship
- SPSY 6930 - School Psychology Internship

Total: 96 Hours

The doctor of psychology in school psychology degree also requires satisfactory completion of a professional portfolio, demonstrating mastery of the program objectives, a passing score (≥ 147) on the ETS PRAXIS specialty exam in school psychology, a passing score on a written comprehensive examination, and enrollment in 4 credit hours of SPSY 8980 and completion of a capstone/applied research project .

Professional Expectations

All students in the SPSY program are expected to show a strong commitment to the program and to maintain a high academic, professional, ethical standards and a sensitivity to diversity. Inappropriate or unprofessional conduct is cause for discipline or dismissal from the program.

Social Science MSS

► Graduate School Rules apply to this program

Requirements for Admission

General rules for admission into the Graduate School apply to admission into the MSS program in addition to the following:

- evidence of a bachelor's degree
- two official copies of transcripts from all community colleges, colleges, and universities attended
- overall GPA of at least 3.0 out of 4.0
- a writing sample
- three letters of recommendation (at least two from academic sources)
- appropriate undergraduate training or professional background, or indicators that supply evidence of ability to pursue the MSS degree
- a typed statement specifying the goal of advanced study in the social sciences expressed in clear, correct and effective English
- standardized test scores are not required, but will be considered if submitted

After meeting all other requirements for admission, applicants may be required to have an interview to discuss their interest in the program and their plans for study. For out-of-state applicants, an appropriate substitute for the interview may be determined by the director.

Provisional Admission:

Applicants may be admitted as provisional-status graduate students if their complete record indicates a high probability of success.

Non-degree Students:

Potential applicants may take graduate-level courses as nondegree students (unclassified student with a bachelor's degree) if they:

1. Wish to strengthen their record in order to demonstrate that they can successfully complete courses in the program
- or-
2. Wish to start courses in the program prior to completing their application. Up to 12 semester hours taken as a nondegree student may be accepted by the program once a student has been admitted into the program (the 12-hour limit also includes graduate work from another university).

For further information on non-degree graduate student status, see the Information for Graduate Students section of this catalog. In the case of CU Denver graduate students transferring to the MSS program, previous course work may be accepted as appropriate to the MSS plan of study.

International Students:

International students must also meet CU Denver requirements for international admission. See the Information for International Students section of this catalog or call 303-315-2230 for further information.

Degree Requirements

The MSS is a 36-semester-hour program, of which 30 hours must meet all specifications of the Graduate School. Throughout their work toward the MSS degree, students must maintain at least a *B* (3.0) average in all courses. A grade below *B-* will not be counted toward the degree.

Students may pursue courses around any coherent theme with the approval of MSS program directors and advisors. In addition to the unlimited self-structured options, there are five focus areas from which students can select: Women's and Gender Studies, International Studies, Social Justice, Society and Environment, and Community Health Science.

Three Required Core Seminars

The following two courses must be taken during the first year following entrance to the program:

- SSCI 5013 - Philosophical Problems in the Social Sciences and Humanities
(Offered spring only)
- SSCI 5020 - Elements of Social Thought
(Offered fall only)
- SSCI 5023 - Research Perspectives in Social Science
(Offered spring only)

Students should take this course only after they have completed 21-24 credit hours, which will be toward the end of the program, when students are ready to write a proposal for their thesis or project.

Total: 9 Hours

Electives

In addition to the 9 credits of required coursework, students must complete a total of 21-24 semester hours comprising a coherent selection of courses from a variety of disciplines. All courses for the self-structured portion of the program must be selected with the approval of one of the MSS program directors.

A total of two independent study courses and two 4000-level undergraduate courses taken while enrolled in the program may count toward the degree. All independent study contracts must be approved by one of the program directors. The remaining coursework must be 5000/6000-level courses offered through various departments.

Students completing a project take 24 hours of electives, while thesis students complete 21 hours of electives.

Total: 21-24 Hours

Thesis or Project

In order to proceed with a thesis or project, all students must submit a proposal approved by three faculty members (and approved by one of the program directors in cases where one of the directors is not serving on the committee). Students must also pass an oral comprehensive exam to graduate. Total hours required are: 3 hours of project and 6 hours of thesis.

- SSCI 6950 - Master's Thesis
- SSCI 6960 - Master's Project or Report

Total: 3-6 Hours

Oral Exam

An oral exam defending the project or thesis before a committee of three faculty members must be passed in order to graduate.

Degree Total: 36 Hours

Sociology MA

► Graduate School Rules apply to this program

Program Requirements

The MA program in Sociology provides a coherent, progressive educational experience that prepares students for either immediate entry to a master's-level career or continued study in a PhD program. Students choose from two options for their Comprehensive Paper that completes the master's degree: either a 3-credit project report that accompanies a 3-credit internship, or a 6-credit thesis. The program also offers 3 concentration areas (Crime, Law & Deviance; Health & Society; Family, Social Services & Community) for students seeking specialization in high-demand career areas.

Required Courses

Tier 1 Knowledge

This includes 5 courses required for all graduate students. SOCY 5000 must be taken in the first fall semester. SOCY 5024 must be taken before SOCY 5183 and SOCY 5193. Students must earn a *B* or better in all core courses.

- SOCY 5000 - Professional Seminar: Sociological Inquiry (3 credits)
- SOCY 5016 - Social Theory (3 credits)
- SOCY 5024 - Seminar: Research Methods I (3 credits)
- SOCY 5183 - Seminar: Quantitative Data Analysis (3 credits)
- SOCY 5193 - Seminar: Qualitative Data Analysis (3 credits)

Tier 1 total: 15 Credits

Tier 2 Knowledge Applied to Substantive Areas

- 12 elective credits (students choosing a concentration must apply 9 of these credits to that area)

Tier 2 total: 12 Credits

Tier 3 Comprehensive Paper

- SOCY 5955 - Master's Thesis (6 credits)
OR
- SOCY 5939 - Internship (3 credits)
AND
- SOCY 5964 - Master's Report (3 credits)

Tier 3 total: 6 Credits

Plans of Study

Students must choose **one** of the following Comprehensive Paper options:

Thesis Option Requirements

Core course requirements	15 Credits
Four substantive area courses	12 Credits
Master's Thesis	6 Credits

- SOCY 5955 - Master's Thesis

Thesis Option Total: 33 Credits

Project Report Option Requirements

Core course requirements	15 Credits
Four substantive area courses	15 Credits
Internship	3 Credits
Master's Report	3 Credits

- SOCY 5939 - Internship
- SOCY 5964 - Master's Report

Project Report Option Total: 33 Credits

Substantive Area Requirements (12 credits for both options)

Students can take an unlimited number of sociology graduate (5000-level) seminars to fulfill their 12 elective credits requirement, or a combination of the following:

- Independent study: maximum 6 semester hours
- Graduate level courses in other departments: maximum 6 semester hours
- Internship: maximum 3 semester hours

Students pursuing one of the concentration areas should work closely with the Graduate Program Director or their Academic Advisor to verify that 9 credits of selected courses qualify for the chosen concentration area.

For further information about the Department of Sociology or the MA program, visit the Sociology website.

Spanish MA

- Graduate School Rules apply to this program

The faculty of the CU Denver Modern Languages Department offer a Spanish Master's degree program that is an alternative to the exclusively literary studies that traditionally lead to doctoral programs. By integrating language, literature and cultural studies with ancillary work in other disciplines, the degree provides a broader expertise that will lead to or enhance careers in teaching, government, social services, business and international trade. Students will tailor the program to their specific interests and needs by developing a topical focus and including courses from outside the Department of Modern Languages, through which they may develop a secondary emphasis that can be incorporated in a thesis project.

Requirements for Admission

In addition to the general admission requirements of the Graduate School, the Spanish MA program requires:

- an undergraduate GPA of at least 3.0, with a GPA of at least 3.0 in Spanish courses

- a bachelor's degree in Spanish is not required, although all candidates must demonstrate Spanish oral and written proficiency at the advanced level, as defined by the American Council on the Teaching of Foreign Languages
- two copies of all college transcripts
- three letters of recommendation
- a statement of the applicant's purpose in pursuing the degree, in Spanish; any gaps, weaknesses or special circumstances affecting an applicant's academic record should be addressed in the statement of purpose portion of the application
- a TOEFL score higher than 550 for students whose previous academic degree was completed in a non-English-speaking country

In special circumstances, the department may modify its admission standards.

Program Requirements

Candidates in Spanish must satisfy the general requirements of the Graduate School as outlined in this catalog and will be required to complete 33 hours of course work distributed with respect to one of the following two options:

Thesis option (course work + thesis):

- **3 hours** SPAN 5000 - Introduction to Graduate Studies in Spanish
- **24 hours** Literature/Culture and Linguistics coursework, including at least 6 semester hours in Literature/Culture and 6 in Linguistics. Students may include up to two courses (3-6 credits) from outside the Modern Languages Department, as approved by their advisor.
- **6 hours** SPAN 5950 - Master's Thesis preparation and writing

Thesis Option Total: 33 Hours

Nonthesis option (course work):

- **3 hours** SPAN 5000 - Introduction to Graduate Studies in Spanish
- **30 hours** Literature/Culture and Linguistics coursework, including at least 6 hours in Literature/Culture and 6 in Linguistics. Students may include up to two courses (3-6 credits) from outside the Modern Languages Department, as approved by their advisor.

Nonthesis Option Total: 33 Hours

Notes:

1. No more than one undergraduate course (3 semester hours) may be applied toward the MA degree, and that course must have been taken at the 4000 level or above and in an ancillary field outside the Department of Modern Languages.
2. Students choosing the nonthesis option may elect to take three courses (9 semester hours) outside the department.

Financial Aid

The department offers a limited number of teaching assistantships for graduate students on a semester-by-semester basis. Appointment is competitive and is typically based on a student's academic credentials. Contact the department for details. For information on grants, federal work-study programs, scholarships and loans, contact the Office of Financial Aid (303-556-2886).

For further information concerning the master's degree in Spanish at CU Denver, direct inquiries to the graduate advisor.

Statistics MS

Program Requirements

Students must present 30 hours of course work (which are broken into 4 components as detailed below) and maintain a 3.0 GPA or above for the M.S. degree. At least 24 of these hours must consist of graduate level (numbered 5000 or higher) courses with the MATH prefix. The remaining 6 hours must be either MATH courses numbered 5000 or above or approved courses outside the department numbered 4000 or above.

Up to 9 semester hours of prior course work may be transferred in (subject to approval); these must be at the 5000 level or above with a B or better grade. Courses already applied toward another degree (graduate or undergraduate) cannot be used toward the M.S. degree in Statistics. Additionally, the following MATH courses will NOT count toward a graduate degree: MATH 5010, 5012, 5015, 5017, 5198, and 5830.

Following completion of course work, all students must complete a written project and pass a final oral exam. The project is developed as a student-centered independent research component within MATH 5960 unless the student has chosen the thesis option. For students choosing the thesis option, 4 to 6 hours (of the 30 required hours) may be devoted to the writing of a thesis through MATH 5950. By graduate school rules, Master's students, whether enrolled full-time or part-time, must complete all degree requirements within 7 years of matriculation.

Course Requirements for the M.S. Degree in Statistics

The M.S. degree in Statistics consists of 4 components: 1) core courses, 2) statistics electives, 3) other electives, and 4) MATH5960 (Master's project) or MATH5950 (Master's thesis).

Core Courses: The core courses include:

- MATH 5310 - Probability
- MATH 5320 - Introduction to Mathematical Statistics
- MATH 5387 - Applied Regression Analysis
- MATH 6330 - Workshop in Statistical Consulting

Statistics Electives: Nine hours of statistics electives are required. A running list is given below. Additional courses can be substituted given prior approval by the student's advisor and the Director of the Program in Statistics.

- MATH 5394 - Experimental Designs
- MATH 6376 - Statistical Computing
- MATH 6380 - Stochastic Processes
- MATH 6384 - Analysis of Dependent Data
- MATH 6388 - Advanced Statistical Methods for Research
- MATH 6393 - Introduction to Bayesian Statistics
- MATH 7384 - Mathematical Probability
- MATH 7826 - Topics in Probability and Statistics
- Additional courses given prior approval by the student's advisor and the Director of the Program in Statistics

Other Electives: Six hours of other electives are required. Any MATH prefix course that can be used for an M.S. or Ph.D. degree in Applied Mathematics can be used as an Other Elective. While these courses could be additional statistics-focused courses, the added flexibility allows students to direct their coursework into other areas of mathematics and/or science. The following courses will not count toward the M.S. in Statistics: MATH 5010, MATH 5012-5015, MATH 5017, MATH 5198, and MATH 5830.

Taxation MS

Program Director: Eric Zinn

Telephone: 303-315-8482

E-mail: Eric.Zinn@ucdenver.edu

The MS in Taxation degree from CU Denver gives you the skills and knowledge you need to be successful in a career in this dynamic and changing industry. Tax professionals are constantly in demand, and the long-term prospects make this a particularly intriguing field.

There is an increasing demand for tax professionals-over 20% job growth in the next decade. The average starting salary in this field is \$60,000. To meet this industry demand the CU Denver Business School has created an MS in Taxation degree to give students the skills and knowledge needed to succeed in this dynamic career field.

The world of tax is constantly changing. Globalization and increased competition, both domestically and internationally, has created a situation where tax law is helping to shape social, political, economic, and business policies and agendas. CU Denver is the only public university in Colorado to offer this specialized degree, and one of only 15 schools nationwide.

Prerequisite (3 semester hours or waiver with advisor approval)

- ACCT 6140 - Tax Planning for Managers
 - OR
 - ACCT 4410 - Income Tax Accounting
- ACCT 4410 or ACCT 6140 or an equivalent course taken at another accredited domestic institution is a prerequisite for all MS in Taxation courses.

Core Requirements (12 semester hours)

- MTAX 6400 - Taxation of Corporations and Shareholders
- MTAX 6440 - Tax Practice and Procedures

- MTAX 6450 - Research Problems In Taxation
- MTAX 6480 - Partnership Taxation

Electives (18 semester hours)

Choose six of the following courses:

- MTAX 6410 - Advanced Tax For Individuals
- MTAX 6420 - Estate and Gift Taxes
- MTAX 6430 - International Taxation
- MTAX 6455 - Tax Aspects Relating to Exempt Organizations
- MTAX 6460 - Advance Topics in Taxation
- MTAX 6475 - Accounting for Income Taxes
- MTAX 6482 - Advanced Partnership Taxation
- MTAX 6500 - Advanced Corporate Taxation

Potential future course offerings:

- State and Local Taxation
- Taxation of Oil, Gas, and other Mineral Rights
- Taxation of S Corporations
- Taxation of Property Transactions
- Taxation of Consolidated Groups
- Methods of Tax Accounting

Urban and Regional Planning MURP

The Master of Urban and Regional Planning Program at the University of Colorado Denver has evolved to become one of the strongest, most unique planning programs in the United States. We offer a very hands-on, real-world oriented program that uses Colorado as our classroom and engages students with top planning/design professionals and the community.

We believe that successful city building requires expertise, breadth, interdisciplinary understanding, and creativity. Our program looks beyond traditional professional silos and instead centers on issues at the forefront of planning practice. Our three Initiatives-Healthy Communities, Urban Revitalization, and Regional Sustainability-form the basis of our research, instruction, and community outreach.

We encourage all students to follow their passion and develop expertise in the areas that matter most to them. Thus, we offer a unique, self-directed curriculum that allows students to understand the breadth of the planning field while gaining the technical expertise demanded by the profession.

Our world-class faculty includes some of the most respected researchers in the planning field, and our award-winning planning practitioners bring a wealth of experience to the classroom. All of our faculty make teaching a top priority.

Our presence in a College of Architecture and Planning ensures that our approach to planning education has a strong connection to design, and our location in the heart of downtown Denver presents our students with endless opportunities to learn what it takes to create amazing cities.

Curriculum

Program Requirements

Completing the MURP degree requires 54 semester hours, comprised of 36 semester hours of required "core" courses and 18 semester hours of elective courses. (Six of the 36 required semester hours represent a self-directed Capstone project or thesis.) Most full-time students complete the program in two years, while other students complete the program at a slower or part-time pace.

New students begin the program of study in the fall semester. Full-time students typically take approximately 12 semester hours per semester; taking more than 15 is generally ill-advised. Students are strongly encouraged to primarily take core courses during their first year of study. With the exception of the studio and capstone courses, most core courses are offered only one semester per year so it is important to pay attention to the scheduling to ensure your desired graduation date.

Core Courses

The MURP Program curriculum includes 10 required "core" courses totaling 36 semester hours. These courses provide students with a comprehensive survey of the planning field and the foundational knowledge, skills, and values important to the profession. The core courses have been carefully designed to fully comply with the Planning Accreditation Board's required educational outcomes. The list below shows the core courses and the program year in which the course is intended to be taken.

Year 1 - Fall

- URPL 5000 - Planning History and Theory
- URPL 5010 - Planning Methods
- URPL 5020 - Planning Law and Institutions
- URPL 5030 - The Planning Profession

12 semester hours

Year 1-Spring

- URPL 5040 - Urban Sustainability
- URPL 5050 - Urban Development
- URPL 5060 - Planning Workshop

12 semester hours

Year 2

- URPL 6000 - Planning Project Studio
Student's choice of ONE of the following 6-credit courses:
- URPL 6900 - Planning Capstone
- OR -
- URPL 6920 - Planning Thesis A
and
- URPL 6925 - Planning Thesis B

12 semester hours

Elective Courses

Beyond the core curriculum, MURP students follow a self-directed educational path. Students may choose any combination from our broad offering of elective courses, whether aligned with one of our three Initiatives, a traditional or unique specialization, or a generalist survey of the planning field. We offer MURP students a broad selection of elective courses within the program. In addition, numerous other elective courses applicable for MURP credit are available through our allied programs within the college (Architecture, Urban Design, Historic Preservation, and Landscape Architecture) and through cross-listed courses offered by other CU Denver programs, such as Public Affairs, Geography, and Business.

Internships

Internships are an important way the MURP program helps students achieve hands-on, experiential learning. The difference between an internship and a part-time job is that an internship is specifically intended to be a learning experience. While getting academic credit for an internship is not required, it is highly recommended. Students earn three elective credits for enrolling in URPL 6805 but, more importantly, the coursework will enable students to maximize the personal and professional development their internship affords.

Planning Workshop/Project Studio

Planning Workshop (URPL 5060) and Planning Project Studio (URPL 6000) are the two studio core courses. These courses are a key part of the hands-on, real-world focus of the MURP program.

Planning Workshop is the introductory studio for MURP students. It provides students an opportunity to address actual planning problems, issues, and processes; apply previously acquired knowledge and skills; and develop new knowledge and practical skills in an applied context.

Students will develop basic competence in accessing existing information, generating new information, and performing planning analysis and synthesis. Students will also learn to enhance their graphic, written, and oral communication capabilities. Through the Planning Workshop experience, students will develop an understanding of the relationship between planning theory and practice, as well as gain the ability to formulate compelling planning arguments in applied settings.

Students will also receive introductory instruction in Trimble SketchUp, which complements the introductory instruction in Geographic Information Systems (ArcView GIS) and Adobe Creative Suite (Photoshop, Illustrator, InDesign) students receive in The Planning Profession course. The integration and use of all of these common planning technology applications is a critical component of the Planning Workshop experience.

Planning Project Studio is the MURP program's advanced studio course. This studio requires students to work together as a "planning consultant team" to complete a single planning project or study from beginning to end for a real-world client. It is expected that students enrolled in Planning Project Studio will have already gained the fundamental planning knowledge, skills, and values from their experience in Planning Workshop and other MURP courses. Consequently, the emphasis in Planning Project Studio is on putting everything together into a complete real-world planning project.

The studio will emulate the typical planning consultant/client experience, including: refining the project scope and schedule with the client; establishing guiding principles and expected outcomes; conducting case studies and existing plans background research; gathering and analyzing existing conditions data; formulating alternative plan concepts; assessing alternative concepts through specific criteria; identifying

and refining the preferred alternative; and preparing and presenting the final plan deliverables to the client. Emphasis is also placed on professionalism, project management, team-building and collaboration, client management, public involvement, and other aspects of the real-world planning consultant realm.

Each Planning Project Studio course section will focus on a project generally associated with one of the MURP program's three initiatives (Healthy Communities, Urban Revitalization, and Regional Sustainability). Typically three to five sections of Planning Project Studio are offered each academic year, thereby ensuring that students will have a chance to enroll in a Planning Project Studio section that is aligned with an initiative of interest to them. However, as each studio section is limited in size, there is no guarantee students will be able to enroll in their preferred section. A balloting process will be used when necessary.

Planning Capstone/Planning Thesis

The culminating component of the MURP curriculum is the Planning Capstone/Planning Thesis requirement, which challenges students to utilize to the fullest extent the planning knowledge, skills, and values gained during their MURP program experience. Students must choose which option to select- Planning Capstone or Planning Thesis-based on their career goals, personal interests and aptitudes, and the advice of their faculty advisor.

Planning Capstone is a six-credit, project-oriented, one-semester course that results in a substantial deliverable upon completion. The Capstone option is best suited for students who wish to pursue a career as a professional planner after graduation. Within the Planning Capstone option are two alternatives: Independent Project and Small-Group Project.

If a student chooses the Planning Capstone > Independent Project path, he or she will work individually to complete a significant planning project or study for a real-world client. If a student chooses the Planning Capstone > Small-Group Project path, he or she must team up with one or two other students-forming a project team of no more than three people-to complete a significant planning project or study for a real-world client. However, each student must be individually responsible for a clearly defined component of the project as each student will be graded independently for his or her work.

During the semester before enrolling in Planning Capstone, students will be required to: (a.) determine if they will be working independently or as part of a small group, (b.) identify their Capstone client and project topic, and (c.) begin preparing a detailed project prospectus (work plan, schedule, methodology, and deliverables). Also during the semester before Capstone, students must attend a mandatory Capstone Orientation to receive instruction and guidance on project planning and management. Students must have a completed and approved project prospectus by the second week of their Capstone semester. Students may identify their own Planning Capstone client and project topic or they may select from a list of Capstone clients/projects that have been pre-arranged and approved by the MURP faculty.

During the Planning Capstone semester, students complete their project work while maintaining regular contact with their Capstone faculty advisor and client to ensure sufficient progress and work quality, as well as periodically meeting with other Capstone students to discuss common issues and challenges, share experiences, and receive continued instruction and guidance from the Capstone faculty on project management and methodologies. The Planning Capstone semester concludes with the submission of all deliverables and a formal presentation to the client and Capstone faculty.

For more information about the Planning Capstone option, please visit the Capstone webpage.

Planning Thesis comprises a pair of three-credit courses (A and B) taken over two semesters that together constitute a six-credit effort. The thesis option is most appropriate for outstanding MURP students who are considering pursuing a Ph.D. or a research-oriented career after graduation.

Certificate Programs

The College offers an official certificate program in geospatial information science (GIS). The Certificate builds upon the extraordinary depth of the GIS community in Colorado and the interdisciplinary teaching and research occurring at the Facility for Advanced Spatial Technology (FASTLab) at CU Denver.

Dual Degree Options

As part of encouraging among planners an appreciation for and knowledge of the perspectives and practices of the other disciplines that participate in planning and city-building, we offer several dual degree opportunities, both within the College of Architecture and Planning and with other units across the University of Colorado system. In every instance the total credit requirement of the Dual Degree is considerably less than would be needed if each degree were independently pursued.

Applicants to any dual degree option must apply to and gain separate admission to each degree program. Once admitted, the student cannot graduate from either program until the work is completed for both degrees.

The degrees that may be combined with the Master of Urban and Regional Planning include:

- Master of Architecture (MURP+MARCH)
- Master of Landscape Architecture (MURP+MLA)
- Master of Public Health (MURP+MPH)
- Master of Public Affairs (MURP+MPA)
- Master of Business Administration (MURP+MBA)
- Juris Doctorate (Law Degree) (MURP+JD-in collaboration with the CU Boulder Law School)

Urban Design MUD

► Graduate School Rules apply to this program

Program Information: Ann Komara

Telephone: 303-315-1000

Email: ann.komara@ucdenver.edu

Program Description

The master of urban design (MUD) is an intensive, calendar year, post-professional degree program for students already holding a first professional degree in architecture, landscape architecture or urban and regional planning (e.g., BArch, BLA, MArch, MLA or MCRP/MURP or equivalents). The interdisciplinary program uses Denver as an urban laboratory but the globe as a reference, educating future designers about the unique place the city holds in addressing the critical problems of our time.

The program began in 1969 and counts several hundred alumni practicing around the world. Our student body is extremely diverse, with recent students from Bangladesh, China, Colombia, India, Iran, Japan, Libya and Saudi Arabia. These students join our domestic students to examine contemporary urbanism and design practice through an interdisciplinary, studio-based curriculum taught by a multi-disciplinary faculty. Coursework is capped off by the International Studio held each summer, when students travel to study urban issues in dynamic, context-based locations.

The program is organized around three central themes reinforced by core studios and seminars:

Sustainable Cities

We take a holistic approach to designing the livable city. Since more than half the world's population lives in cities, with that number set to increase to two-thirds by 2030, we must anticipate the ecological impacts of our design decisions. In preparation for a post-carbon era, we address concerns related to climate change, energy usage, public health, food production and resource availability through an integrated approach to the design of urban settlements. Our students re-imagine and re-interpret urban systems - from transportation networks to hydrological systems to zoning codes to social movements - with the goal of creating cities that are at once socially just, economically diverse and ecologically resilient. These challenges are unprecedented and must be urgently addressed: we believe that urban designers are best positioned to meet them head on.

Local to Global

We believe urban designers must recognize the interrelated local and global impacts of their actions and understand the interdisciplinary nature of urban problems. We address design issues at all scales, from the individual public space to the neighborhood, city, region, nation and world. This ecological approach acknowledges that all sites are embedded within larger systems, a concept we engage in all our studios. In the fall and spring, students examine the Denver metropolitan area, a progressive, yet prototypical, urban laboratory experiencing significant growth and development and home to every urban condition imaginable, from dense downtown infill to sprawling edge cities to the New Urbanism-inspired Stapleton airport brownfield redevelopment. The Front Range is a national leader in design and planning innovation, as represented by the multi-billion dollar FasTracks transit project, Denver's groundbreaking new citywide form-based code, Boulder's open space acquisition policies and energy municipalization effort, Arvada's GEOS net-zero energy neighborhood, and Fort Collins' closed-loop brewery-oriented development. Students apply the skills and knowledge gained in their local study in the summer term in a joint studio set in either the Shanghai-Nanjing corridor with faculty and students from the nation's top schools of architecture and design at Tongji University and Southeast University or in the dense urban core of Copenhagen, Denmark with faculty and students at the Danish Institute for Study Abroad (DIS).

Innovations in Practice

We train our students to become critical, reflective professionals with a deep understanding of urban design theory and practice. All our graduates possess knowledge of contemporary urban thinking as well as exceptional technical, verbal and graphic communication skills. Our curriculum is informed by innovations in current practice: we undertake real projects with real clients, and all studios are taught by leading practitioners from the top design firms in the region. Each year, we bring in a renowned practitioner-in-residence to teach a core course, give lectures, and serve as a juror in all MUD studios. To address the most complex social-ecological problems of our time, we see high demand for graduates who possess multiple

talents, a broad understanding of urban planning, architecture, landscape, real estate development, and urban politics and economics, and the ability to work not only with design professionals but also engineers, policy makers, environmental scientists and the public. Students take collaborative, multidisciplinary studios with all College of Architecture and Planning students in an environment that more accurately reflects professional practice, with shorter studios, team projects and design charrettes. Importantly, our MUD Internship Program aims to place all incoming students into an internship with the region's top design firms. Participating firms have included: AECOM, Civitas, Design Workshop, Norris Design, RNL Design, OZ Architecture, studioINSITE and Tryba Architects. College units including the Colorado Center for Community Development (CCCCD) frequently hire MUD students as research assistants (RAs) and the departments of Architecture, Landscape Architecture and Planning and Design often hire teaching assistants (TAs) from our incoming MUD students.

Prerequisites

Students are required to hold a first professional degree in architecture, landscape architecture or urban and regional planning (e.g., BArch, BLA, MArch, MLA, MURP/MUP or equivalents).

Admissions

The master of urban design admissions committee accepts applications for fall semester entry. The program does not allow entry to the program in any spring semester. The priority deadline is February 15; final deadline is March 15.

Pre-professional students can enter the MUD with advanced standing by first earning a professional master's degree in the College of Architecture and Planning. For more information on the MArch+MUD, MLA+MUD or MURP+MUD, visit the college website.

The requirements the admissions committee considers are:

- Evidence of a professional degree (BArch, BLA, MArch, MLA, MURP/MUP or equivalent)
- At least a 3.2 undergraduate or graduate cumulative GPA
- Your statement of purpose (which should include your educational and professional goals)
- Résumé (which describes your educational and professional background)
- A portfolio that includes examples of student or professional projects
- A list of courses that you have taken that relate to design and planning
- A writing sample from previous professional or academic work
- Graduate Record Exam (GRE) scores if available (not required for admission)
- A separate statement indicating whether you would like to participate in the MUD Internship Program
- English language proficiency (TOEFL) scores are required for international applicants when English is not their first language. Please see International Admissions website for current minimum score requirements.

Program Requirements

The requirements for the postprofessional master of urban design (MUD) degree depend on your current standing and educational background. The basic study plan is a 36-semester-hour plan that includes two

elective courses. Students obtaining a first professional degree in the University of Colorado Denver College of Architecture and Planning may receive up to 12 semester hours of advanced standing.

Core Courses

The basic study plan is 36 semester hours including these core courses, plus two elective courses (could include an independent study or internship).

- URBN 6610 - Design Studio I
- URBN 6611 - Design Studio II
- URBN 6612 - International Design Studio
- URBN 6641 - Design Process
- URBN 6642 - Design Policy
- URBN 6651 - Design Practice
- URBN 6652 - Design Seminar

Total: 36 hours

Dual Degree Programs

Bioengineering Dual MS-MBA

► Graduate School Rules apply to this program.

Master of Science (MS) - Master of Business Administration (MBA) Dual Degree Program

We offer a dual MS-MBA in partnership with the CU Denver Business School. Please contact either program for more information and advising. Students registered in other MS programs in the University of Colorado system may be able to combine the two degrees; please contact us at bioengineering@ucdenver.edu for more information.

Bioengineering MD-MS

We offer an MD-MS in bioengineering in partnership with the University of Colorado School of Medicine. This dual degree option is available to current CU medical students only. Prospective students should contact the department at bioengineering@ucdenver.edu as early in their medical school training program as possible for more information and advising.

Bioengineering MD-PhD

► Graduate School Rules apply to this program.

For students already enrolled or accepted into the Medical Scientist Training Program (MSTP) in the School of Medicine at University of Colorado Anschutz Medical Campus. Degree completion in 7-8 years

with highly individualized training pathway and multidisciplinary research dissertation. Please contact us for advising.

Business Administration/Business MBA/MS

The Business School also offers MBA/MS dual degree programs for each function of business. The program consists of a minimum of 66 semester hours of graduate work and leads to both an MBA degree and an MS degree, which must be completed within seven years and one semester. See MS program pages for a list of functional areas. Contact a graduate academic advisor for details, 303.315.8200.

Business Administration/Global Management MBA/MGM

This unique combined degree is offered in cooperation with the Thunderbird School of Global Management located in Glendale, Arizona, a suburb of Phoenix. Thunderbird has established eight dual programs with universities in the United States. The student applies independently to both schools and, if admitted, earns the MBA from CU Denver and a Master of Global Management degree from Thunderbird. The student begins the program at CU Denver and, after completing 36 semester hours (12 courses) required for the MBA, transfers to the Thunderbird campus and takes a minimum of 30 semester hours (10 courses) for the MGM. When all dual degree requirements are finished, the student is awarded a diploma from each school. For more information about admission to the MBA on the Denver campus, refer to the appropriate section of this chapter. For specifics about the dual MGM application process, call Felicia Welch, the associate director of academic and international services at Thunderbird, 1-800-848-9084.

Business Administration/Medicine MBA/MD

The MBA/MD is for medical students at the University of Colorado School of Medicine who wish to pursue a career in administrative medicine or who seek additional training in administration or business. The program is designed to be completed in five years, at which time both the MD and MBA degrees would be awarded. Candidates for the MBA/MD complete 36 semester hours of course work in the business school and all requirements for the MD.

Business Administration/Urban and Regional Planning MBA/MURP

This dual degree enables students to obtain both the Master of Urban and Regional Planning offered by the College of Architecture and Planning and the Master of Business Administration offered by the Business School upon completion of 78 semester hours. The dual degree program is composed of the core curricula in each program plus a set of electives jointly approved by the student's advisors.

Business/Business MS/MS

Students may concurrently pursue dual MS degrees in any two fields of business. The program consists of a minimum of 51 semester hours of core course work, which must be completed within a period of seven years and one semester. In addition, candidates for the dual degree must satisfy all common body of knowledge (CBK) and background requirements prescribed for each degree. Waivers may be approved for some of the CBK or background upon transcript evidence of equivalent undergraduate or graduate course work. For more information contact a graduate academic advisor, 303-315-8200.

Chemistry BS/MS

While students are completing a BS degree in chemistry, they may also complete some of the requirements for an MS degree in chemistry under the following guidelines:

- The student must apply and be accepted for participation in the BS/MS program prior to completion of the BS degree and be advised by both the undergraduate and graduate advisors.
- Up to 12 semester hours of graduate-level course work may be taken as an undergraduate and applied toward the MS degree. This course work may not be applied toward the BS degree or ACS certification requirements for the BS degree.
- In addition, up to 3 semester hours of independent study (research) may be applied toward the graduate degree if that research is expanded and continued for a portion of the master's thesis research. This requires approval of the student's graduate research advisor in chemistry, the chemistry graduate program director and the CLAS associate dean for graduate studies.
- The chemistry department will waive the requirement for qualifying examinations in each area of chemistry for which the student has completed the undergraduate sequence of courses and laboratories at the Downtown Campus with grades of *B (3.0)* or better for each course.
- The student must apply for and be admitted to the graduate program in chemistry beginning the semester immediately following completion of the BS degree in chemistry at the Downtown Campus.

This program allows undergraduate students who have begun their research as undergraduates to complete up to 12 semester hours (with approval of the graduate dean) toward the 30 semester hours required for a Plan I MS degree in chemistry while they are still completing their BS degree. This makes it possible for students to complete an MS degree in chemistry in only one year beyond the BS degree in chemistry. Students entering the program through the BS/MS program option must fulfill all of the requirements of the Plan I or Plan II graduate programs.

Criminal Justice BA/MCJ

The dual BA/MCJ program is designed to allow students to work concurrently toward the BA in criminal justice and the master in criminal justice (MCJ). Graduate credit hours earned while enrolled in the BA/MCJ program can be counted toward both the bachelor of arts and master of criminal justice. This program offers high-achieving students the opportunity to complete their undergraduate and graduate degrees in criminal justice in five years.

Admissions Requirements and Process

Interested students should contact their BA academic advisor as early as possible to ensure proper planning for the five year degree.

Eligibility Requirements

Both current CU Denver students and new transfer students are eligible to apply after meeting the following:

- Currently enrolled in the School of Public Affairs as a criminal justice major
- Completed the University of Colorado Denver's undergraduate core curriculum
- Completed 60 semester credit hours

- Completed the following 12 semester credit hours in criminal justice: CRJU 1000 Criminal Justice: An Overview, CRJU 2041 Crime Theory and Causes, CRJU 3100 Criminal Justice Research Methods, and CRJU 3150 Statistics for Criminal Justice (transfer criminal justice courses must have been approved and accepted toward the major).
- Minimum 3.0 cumulative GPA
- Minimum 3.5 cumulative GPA in criminal justice courses
- Completed or scheduled official GRE or LSAT exam

Application Process

Students should apply after earning 75 credit hours of undergraduate coursework and before earning 90 credit hours. For full consideration, students must submit all application materials by Oct. 15 for admission to the following spring semester and by March 15 for admission to the fall semester. The following steps should help in the application process:

1. Plan ahead when scheduling courses through the junior year. All four of the required criminal justice courses listed above and all of the student's core education requirements must be completed by the end of the student's junior year.
2. At the beginning of the semester in which the student is applying to the program, the student should approach a criminal justice faculty member about writing a letter of recommendation. The student should also begin working on a personal statement of purpose. The following guidelines should help with writing the statement.
 - o Length: 1 to 2 pages
 - o The statement should describe:
 - Applicant's reasons for undertaking graduate study in criminal justice
 - Applicant's future career plans
 - Planned area of concentration within criminal justice
3. By Oct 15 of the fall semester or March 15 of the spring semester the student must submit the following items to the undergraduate coordinator:
 - o Personal statement of purpose
 - o One letter of recommendation from a faculty member
 - o School of Public Affairs' BA/MCJ application form
 - o Completed or scheduled GRE or LSAT scores

Admission Criteria

Admission to the BA/MCJ program is competitive. Applicants will be evaluated on the following:

1. Grade point average (overall and in criminal justice course work)
2. Grade trend (improving, consistent, or declining)
3. Total number of credit hours completed
4. Likelihood of success and persistence based from the Statement of Intent and Reference Letter
5. Completed or scheduled GRE or LSAT scores

Students who are not admitted to the BA/MCJ program are eligible to reapply after completing an additional 12 semester credit hours. Students can apply and be considered for admission to the dual BACJ/MCJ program a maximum of two times.

BA/MCJ Program Matriculation

Students must successfully complete (B, or better) a minimum of 3 semester credit hours of graduate criminal justice course work each semester following admission to the BA/MCJ program. A maximum of 15 graduate semester credits can be completed as a BA/MCJ student, for dual credit.

Students must maintain a minimum 3.0 cumulative grade point average for all course work and a 3.0 grade point average for courses in criminal justice.

The School of Public Affairs reserves the right to rescind a BA/MCJ student's admittance to the dual program if at any point the students' grade point average falls below the requirements lists above.

Tuition and Fees

Students will be assessed tuition and fees at the undergraduate rate until the Bachelor of Arts in Criminal Justice degree is conferred.

Students will assess tuition and fees at the graduate level upon formal acceptance to the Master of Criminal Justice program.

Program Requirements

General BA/MCJ Degree Program Requirements

- 144 total semester credit hours successfully completed
- 37-38 semester credit hours in the general education core curriculum
- 46-48 semester credit hours in general electives
- 21 semester hours of undergraduate criminal justice course work
- 18 upper-level (3000 or higher) semester credit hours in criminal justice
- 45 total semester hours of upper-division course work (3000 and above)
- Minimum 3.0 CU cumulative grade point average in undergraduate criminal justice courses
- Full acceptance to the Graduate School and the Master in Criminal Justice program
- Minimum 36 semester hours of graduate-level course work (5000 and above)
- Minimum of 30 hours of resident credit; 21 out of the last 30 hours in resident course work
- Minimum of a B (3.0) in each required core MCJ course
- Minimum of 3.0 CU cumulative grade point average in all graduate level courses
- Successful completion of master of criminal justice capstone or thesis
- Fulfillment of all college and major requirements

Degree Confirmation

Students are eligible to receive the BA in criminal justice degree once they have successfully completed 120 semester hours and all CU Denver undergraduate degree requirements. The MCJ will be conferred once the student has completed all requirements of the Master of Criminal Justice degree.

Economics MA/Applied Mathematics MS Dual Degree, with a focus in Applied Statistics

- Graduate School Rules apply to this program.

Admissions Advisor: Brian Duncan (brian.duncan@ucdenver.edu)

Schedule Advisor: Hani Mansour (Hani.Mansour@ucdenver.edu)

The fields of mathematics and economics are inextricably linked. In economics, mathematics and statistics are used extensively in theory construction, tests of existing theories and discovery of regularities to inform new theories. Economics also gives mathematicians/statisticians new challenges, new outlets and new ideas to incorporate in mathematics. These complementarities have long been recognized and economics graduate students have always been advised to take advanced courses in statistics.

A "dual" degree means that students who complete the program earn two master's degrees: MA in economics and MS in applied mathematics. Students interested in completing the dual degree in economics and applied mathematics must apply separately to each program, meet the admission requirements of each program, and be accepted by each program. If one program accepts a student for the dual degree but the other program does not, then the student may not graduate under the dual degree program. Students may apply to both programs at the same time or apply to the economics program first, and then to the applied math program after their first semester, or vice versa. Both programs must be completed in the same semester to take advantage of the dual degree program. Further information about this program can be obtained from either the Department of Economics or the Math Department.

[Click here for admissions requirements for the MA program in Economics](#)

[Click here for admissions requirements for the MS program in Applied Mathematics](#)

There are an increasing number of economics MA students wishing to obtain graduate training and a degree in statistics. Having an MA degree in economics and an MS degree in Applied Mathematics will make a student highly employable in the job market and provide them an edge in applying for elite PhD programs.

Degree Requirements

The requirements for the dual degree in economics and applied mathematics include completing 21 credit hours in ECON and 21 credit hours in MATH (42 total credit hours).

Students are expected to meet all course prerequisites. ECON 5803 – Mathematical Economics is a prerequisite for ECON 5073 - Microeconomic Theory and ECON 5813 - Econometrics I. This prerequisite requirement is waived for students who are currently admitted to the MS Applied Mathematics program.

A grade of B- or better is required in all courses, with a cumulative grade point average of B (3.0) or above. No course may be taken more than twice.

Core Courses

- ECON 5073 - Microeconomic Theory
- ECON 5083 - Macroeconomic Theory
- ECON 5813 - Econometrics I
- ECON 5823 - Econometrics II
- ECON 6053 - Seminar In Applied Economics
- ECON 6054 - Seminar In Applied Economics II
- MATH 5070 - Applied Analysis
- MATH 5718 - Applied Linear Algebra
- MATH 6330 - Workshop in Statistical Consulting
- MATH 6388 - Advanced Statistical Methods for Research

- MATH 7381 - Mathematical Statistics I
- MATH 7382 - Mathematical Statistics II
- ECON 6073 - Research Seminar

Total: 36 hours

Electives

One 5000 or higher course with a MATH prefix (**3 semester hours**), except MATH 5000-5010, MATH 5017, MATH 5198, and MATH 5250. Contact a graduate advisor in the Math Department for information about Math course requirements.

One 5000 or higher course with an ECON prefix (**3 semester hours**).

Contact a graduate advisor in the Economics Department for information about Econ course requirements.

Total: 6 Hours

Dual Degree Total: 42 Hours

Economics MA/Finance MS Dual Degree

► Graduate School Rules apply to this program

Admissions Advisor: Brian Duncan (brian.duncan@ucdenver.edu)

Schedule Advisor: Hani Mansour (hani.mansour@ucdenver.edu)

For students interested in combining the quantitative skills of an economics degree with the specific applications of a business degree, we offer an MA economics / MS finance dual degree. This 42-semester-hour program is offered jointly with the Business School.

A "dual" degree means that students who complete the program earn two master's degrees: MA in economics and MS in finance. Students interested in completing the dual degree in economics and public administration must apply separately to each program, meet the admission requirements of each program, and be accepted by each program. If one program accepts a student for the dual degree but the other program does not, then the student may not graduate under the dual degree program. Students may apply to both programs at the same time or apply to the economics program first, and then to the finance program after their first semester, or vice versa. Both programs must be completed in the same semester to take advantage of the dual degree program. Further information about this program can be obtained from either the Department of Economics or the Business School.

[Click here for admissions requirements for the MA program in Economics](#)

[Click here for admissions requirements for the MS program in Finance and Risk Management](#)

The dual degree program is intended to create highly-skilled research professionals with considerable econometric skill as well as familiarity with their chosen financial institutions. Given the similarity in course work within the two programs, there can be considerable time savings for the student. Essentially,

the program allows students to complete the two programs that separately would require 60 hours of course work with 42 hours of combined course work.

Degree Requirements

The requirements for the dual degree in economics and finance include completing 21 credit hours in ECON and 21 credit hours in FNCE (42 total credit hours)

Students are expected to meet all course prerequisites. A grade of B- or better is required in all courses, with a cumulative grade point average of B (3.0) or above. No course may be taken more than twice.

Core Courses

- ECON 5073 - Microeconomic Theory
 - ECON 5083 - Macroeconomic Theory
 - ECON 5803 - Mathematical Economics
 - ECON 5813 - Econometrics I
 - ECON 5823 - Econometrics II
 - ECON 6073 - Research Seminar
 - BUSN 6640 - Financial Management
 - FNCE 6300 - Macroeconomics and Financial Markets
 - FNCE 6330 - Investment Management Analysis
 - FNCE 6380 - Futures and Options
 - **-OR-**
 - FNCE 6382 - Survey of Financial Derivatives
 - **-OR-**
 - FNCE 6410 - Real Options and Decisions Under Uncertainty
- Total: 30 Hours**

Electives

Three 6000 or higher courses with a FNCE prefix (9 semester hours), except FNCE 6290 - Quantitative Methods. Contact a graduate advisor in the Business School for information about Finance course requirements.

One 5000 or higher course with an ECON prefix (3 semester hours). Students are strongly encouraged to take 3 elective hours of ECON 6053/6054 or to meet with an economics graduate advisor to discuss how to otherwise prepare for ECON 6073 - Research Seminar. Contact a graduate advisor in the Economics Department for information about ECON course requirements.

Total: 12 Hours

Dual Degree Total: 42 Hours

Economics MA/Public Administration MPA Dual Degree

- Graduate School Rules apply to this program

Admissions Advisor: Brian Duncan (brian.duncan@ucdenver.edu)

Schedule Advisor: Hani Mansour (Hani.Mansour@ucdenver.edu)

The fields of public administration and economics are inextricably linked. Economists provide much of the theory and analytic foundation that administrators use to evaluate and implement policy. Given that the capital of the state of Colorado is in Denver, there is great need for administrators that fully understand methods of program evaluation and have the theoretical background needed to forecast how individuals and institutions will respond to new proposals. Similarly, good theory and practice must take into account how the proposals will be implemented and results interpreted. Both administrators and economists need to be engaged in constructive dialog for either to be fully effective.

A "dual" degree means that students who complete the program earn two master's degrees: MA in economics and MPA in public administration. Students interested in completing the dual degree in economics and public administration must apply separately to each program, meet the admission requirements of each program, and be accepted by each program. If one program accepts a student for the dual degree but the other program does not, then the student may not graduate under the dual degree program. Students may apply to both programs at the same time or apply to the economics program first, and then to the public administration program after their first semester, or vice versa. Both programs must be completed in the same semester to take advantage of the dual degree program. Further information about this program can be obtained from either the Department of Economics or the School of Public Affairs.

[Click here](#) or admissions requirements for the MA program in Economics

[Click here](#) for admissions requirements for the MPA program in Public Administration

Degree Requirements

The requirements for the dual degree in economics and public administration include completing 21 credit hours in ECON and 27 credit hours in PUAD (48 total credit hours).

Students are expected to meet all course prerequisites. A grade of B- or better is required in all courses, with a cumulative grade point average of B (3.0) or above. No course may be taken more than twice.

Core Courses

- ECON 5073 - Microeconomic Theory
- ECON 5083 - Macroeconomic Theory
- ECON 5803 - Mathematical Economics
- ECON 5813 - Econometrics I
- ECON 5823 - Econometrics II
- PUAD 5001 - Introduction to Public Administration and Public Service
- PUAD 5002 - Organizational Management and Behavior
- PUAD 5003 - Research and Analytic Methods
- -OR- PUAD 5004 - Economics and Public Finance
- PUAD 5005 - The Policy Process and Democracy
- PUAD 5006 - Public Service Leadership
- ECON 6073 - Research Seminar
- -OR- PUAD 5361 - Capstone Seminar

Total: 33 hours

Electives

If the student elects to take the capstone course ECON 6073 - Research Seminar

One 5000 or higher course with an ECON prefix (3 semester hours).

Students are strongly encouraged to take 3 elective hours of ECON 6053/6054 or to meet with an economics graduate advisor to discuss how to otherwise prepare for ECON 6073 - Research Seminar.

Four 5000 or higher course with a PUAD prefix (12 semester hours).

If the student elects to take the capstone course PUAD 5361 - Capstone Seminar

Two 5000 or higher course with an ECON prefix (6 semester hours).

Three 5000 or higher course with a PUAD prefix (9 semester hours).

Contact a graduate advisor in the Economics Department for information about Econ course requirements.

Contact a graduate advisor in the School of Public Affairs for information about public administration course requirements.

Total: 15 hours

Dual Degree Total: 48 Hours

Finance/Economics MS/MA

Students may concurrently pursue an MA in Economics offered by the College of Liberal Arts and Sciences and the MS in Finance offered by the Business School. Students must complete 27 semester hours of a combination core, 15 semester hours of combination electives and 3 semester hours of a 5000- or 6000-level economics elective. Students apply to each program separately and admission into one of the programs does not guarantee admissions into the second program.

Political Science MA / Master of Business Administration (MBA) Dual Degree

► Graduate School Rules apply to this program.

In the 21st century, the fields of business administration and political science intersect, in that sustainable business development requires an understanding of the political environment, while political theory and practice must address the role of the business community in economic development. Providing students with both the business foundation and the political knowledge enhances their ability to succeed in our ever-changing political world.

The CU Denver Master of Arts in Political Science (MA) degree offers an in-depth understanding of the political environment, locally, nationally and globally, emphasizing the development of academic and practical skills in key areas of the discipline, and centering on the major fields of American politics, comparative politics, international relations, political theory and public policy. The CU Denver Master of Business Administration (MBA) degree provides a strong foundation in business knowledge in such areas

as organizing teams, developing marketing plans, using data analysis and technology in decision making, economics, financial management and strategic planning. The MBA develops skills required for competent and responsible administration of an enterprise viewed in its entirety, within its social, political and economic environment.

The Dual Master's Degree in Political Science (MA) and Business Administration (MBA) is designed for students whose interests overlap business and politics or business and international affairs. This program is jointly sponsored by the Department of Political Science of the College of Liberal Arts and Sciences and the Business School. This program enables students to simultaneously earn an MA in Political Science with an MBA.

The dual degree program provides a more comprehensive education to the next generation of professionals in the non-profit sector, corporate arena and governmental organizations. Dual degree students are able to complete both degree programs in less time, and with fewer total credit hours (66 for both), than if both degrees were pursued separately ($48+33 = 81$). The program keeps the core of each program intact, including some electives from both programs, and enables students to choose two additional electives from either business or political science to best suit their career and personal goals. Furthermore, the interactions between the students enrich the students in both programs, as well as the organizations that employ them.

Admission Requirements

Students must apply separately to, meet the admission requirements of, and be accepted by each program. It is possible for students currently admitted to one program to learn about the dual degree and choose to apply after admission to the other program.

GPA Requirements

Students must maintain a cumulative GPA of 3.0 or higher across all courses that are applied to the dual degree. Any political science course in which a student receives a final grade lower than *B-* cannot be counted toward the total credits for the dual degree. Any business course in which a student receives a final grade lower than *C* cannot be counted toward the total credits for the dual degree. All graduate courses will be included in the cumulative GPA.

Transfer Credits

No more than 9 semester hours of business credits from an AACSB Business School with a grade of *B* or better and no more than 6 semester hours of political science credits may be transferred into this dual degree program. The Business School will evaluate transfer hours in business and the Political Science Department will evaluate transfer hours in political science.

Graduation

Students must complete all the requirements for both programs before they apply to graduate, and must apply to graduate in the same term for both programs.

Degree Requirements

MBA Core (30 Hours)

- BUSN 6520 - Leading Individuals and Teams
- BUSN 6530 - Data Analysis for Managers
- BUSN 6540 - Legal and Ethical Environment of Business
- BUSN 6550 - Analyzing and Interpreting Accounting Information
- BUSN 6560 - Marketing Management
- BUSN 6610 - Information Systems Management and Strategy
- BUSN 6620 - Applied Economics for Managers
- BUSN 6630 - Management of Operations
- BUSN 6640 - Financial Management
- BUSN 6710 - Strategic Management

International Elective (3 Hours)

Any course numbered 6000 or higher with the INTB prefix

or ENTP 6826 - International Entrepreneurship

or any graduate-level business course that is cross-listed with an INTB prefix. Travel study offered by the Business School will also apply.

Political Science Core (18-21 Hours)

- PSCI 5000 - State of the Discipline
- PSCI 5468 - Research Methods in Political Science
 - Graduate Seminar in American Politics subfield
 - Graduate Seminar in Comparative or International Politics subfield
 - Graduate Seminar in Political Theory subfield
- PSCI 5950 - Master's Thesis (6 credits)
- OR
- PSCI 5960 - Master's Project (3 credits)

Political Science Electives (6-9 Hours)

PSCI graduate seminars [must complete 6 hours if thesis, or 9 hours if project (from Political Science Core)]

Free Electives (6 Hours)

Courses must be from either the Business School or Political Science department, meeting the descriptions below. A combination of both is also acceptable.

Business Free Electives: Any course numbered 6800 or higher with a BUSN prefix or any course numbered 6000 or higher with a prefix of ACCT, DSCI, ENTP, FNCE, HLTH, INTB, ISMG, MGMT OR MKTG.

Political Science Electives: *Any course numbered 5000 or higher with a PSCI prefix.*

Public Administration MPA/JD

The School of Public Affairs and the University of Colorado at Boulder School of Law jointly sponsor a dual degree program leading to the simultaneous granting of the master of public administration (MPA) and juris doctor (JD) degrees. The program may be of particular interest to students who wish to practice law within the public sector, obtain a senior administrative post, represent public-sector clients, represent private-sector clients in transactions with government agencies and institutions and/or develop scholarly expertise in the relationship between law and public administration.

Interested persons must separately apply to and be admitted by both SPA and the School of Law. Upon admission, students may begin full-time study at either SPA or the School of Law; however, law study must be initiated no later than the beginning of the second year of enrollment in the program, and the first year of law study must be taken in its entirety and exclusive of nonlaw course work.

Through the choice of electives, students may develop a limited substantive specialization within the study of law and public administration. The dual degree program is structured to allow for 12 semester hours from the law school to be accepted as electives in the 36-semester-hour MPA program, and 12 semester hours from SPA to be accepted into the law school's 89-semester-hour JD program. Students are thus simultaneously awarded both degrees with a cumulative total of 101 semester hours; the program therefore allows students to complete all dual degree requirements in approximately four years of full-time study. Students without prior public-sector work experience will be required to complete an internship in an appropriate governmental institution or closely related nonprofit organization.

Public Administration/Criminal Justice MPA/MCJ

The fields of public administration and criminal justice are closely connected. While the MPA is a generalist degree designed to prepare graduates for a variety of positions in administration and policy analysis, criminal justice studies prepare graduates to work in public service organizations within the substantive policy area. By providing an opportunity for students to complete both a generalist master's degree as well as a specialist master's degree, graduates will be equipped not only with administrative skills applicable to a number of public service settings, but also will have deep knowledge of work that pertains to criminal justice settings.

Admission

Students pursuing the joint degree program must apply separately to each of the programs and be admitted to each of the programs. If one program accepts student for the dual degree but the other program does not, then the student will not be accepted for the dual degree. It is possible for students currently admitted to one program to learn about the dual degree and choose to apply after admission to the other.

The MPA and MCJ Program Directors serve as advisors for this program. Interested applicants should consult one of the Program Directors before applying.

Course Requirements

Students enrolled in the dual degree program must complete a minimum of 24 credit hours in each of the two programs (not counting Internship or Field Study if required). Because each program requires 36 (not counting Internship or Field Study) credit hours, the student will be able to complete 48 hours and earn two degrees. This means that the student can earn two degrees by completing 66% of the credit hours that would be required if the student were pursuing each degree separately.

Interested students should contact the School of Public Affairs directly for specific information on course sequencing and requirements.

Public Administration/Economics MPA/MA

The fields of public administration and economics are inextricably linked. Economists provide much of the theory and analytic foundation that administrators use to evaluate and implement policy. Given that the capitol of Colorado is in Denver, there is great need for administrators that fully understand methods of program evaluation and have the theoretical background needed to forecast how individuals and institutions will respond to new proposals. Similarly, good theory and practice must take into account how the proposals will be implemented and results interpreted. Both administrators and economists need to be engaged in constructive dialog for either to be fully effective.

Therefore the Department of Economics of the College of Liberal Arts and Sciences and the School of Public Affairs jointly sponsor a dual degree program. This program enables students to simultaneously earn an MA degree in economics with a master of public administration (MPA).

The dual degree program provides students to opportunity to take the core of both programs and choose electives that suit their career and personal goals best. Electives in one program are allowed to count as an elective in the other. The net result is that while both degrees separately require 66 hours, the dual degree program provides a more comprehensive and effective education in 48 hours or 73 percent of the dual degree total.

Degree Requirements

Admission into both programs

Students must apply separately to each program, meet the admission requirements of each program and be accepted by each program. If one program accepts a student for the dual degree but the other program does not, then the student will not be accepted for the dual degree. It is possible for students currently admitted to one program to learn about the dual degree and choose to apply after admission to either economics or SPA.

Other policies

Minimum Grade for Graduation

Students must maintain a GPA of 3.0 or higher across all courses that are applied to the dual degree. Students who fail to maintain a GPA of 3.00 will be placed on probation for a semester, after which they may be dropped from the dual degree program if the GPA is not increased to 3.0 or above. Additionally, any core course in which a student receives a final grade lower than B- cannot be counted toward the total credits required for the dual degree; in such a case, the student must retake the course.

Capstone Advising

All students are required to complete a capstone paper and obtain the signatures of three graduate faculty. Every dual degree student, regardless of the capstone course they choose (ECON 6073 or PUAD 5361) must select a committee composed of faculty from both programs.

Course Credit Transfers from Other Universities

No more than 6 hours may be transferred, and both SPA and economics program directors must approve any transfers.

Sample Plan of Study for the MPA/MA Economics

Total: 48 semester hours with 21 in economics and 27 in public administration

Core

(33 semester hours)

A grade of B- or better is required in all core courses, with a B average overall. No public administration course may be taken a third time.

- ECON 5073 - Microeconomic Theory
 - ECON 5083 - Macroeconomic Theory
 - ECON 5803 - Mathematical Economics
 - ECON 5813 - Econometrics I
 - ECON 5823 - Econometrics II
 - PUAD 5001 - Introduction to Public Administration and Public Service
 - PUAD 5002 - Organizational Management and Behavior
 - PUAD 5003 - Research and Analytic Methods
 - or
 - PUAD 5004 - Economics and Public Finance
 - PUAD 5005 - The Policy Process and Democracy
 - PUAD 5006 - Public Service Leadership
 - ECON 6073 - Research Seminar
 - or
 - PUAD 5361 - Capstone Seminar
- To be completed after all other core courses or with instructor and advisor consent.

Electives

(15 semester hours)

If the student takes PUAD 5361, then they are required to take 6 semester hours of economics electives and 9 semester hours of electives from SPA labeled 5000 or above.

If the student takes ECON 6073, then they are required to take 3 semester hours of economics electives and 12 semester hours of electives from SPA labeled 5000 or above.

Public Administration/Public Health MPA/MPH

Applying for the Program

Students need to apply to the School of Public Health with a separate application. Students must be admitted to both programs to participate in the dual degree.

Course Requirements

To complete the dual degree, students take all the core courses in each program, 9 elective credits from the School of Public Affairs, 9 elective credits from the School of Public Health, and the School of Public Health's capstone course requirements. Total credits required: 60 semester credit hours. For more information, see the course map provided on the School of Public Affairs website; spa.ucdenver.edu.

When to Enroll

Students should indicate intention to complete the dual degree upon application to the School of Public Affairs and simultaneously complete the application for the School of Public Health. SPA does not have a limit on the number of students who can enroll. Students already enrolled in the School of Public Affairs student may begin the SPH application right away (see the SPH for application deadlines), while taking MPA classes. It is best to get started on the application process right away, so that advising matches graduation goals.

Advising

Once admitted to the dual degree program, students have an advisor from each school.

Public Administration/Urban and Regional Planning MPA/MURP

Background and Purpose

Public administration and urban and regional planning have many aspects in common. To provide students with an excellent education through understanding of both professions, the School of Public Affairs and the College of Architecture and Planning have developed a dual degree program. Students can obtain both master of public administration (MPA) and master of urban and regional planning (MURP) degrees with a minimum of 63 semester hours, as compared to a total of 87 semester hours to complete both degrees independently.

To be eligible for the dual MPA/MURP degree program, students must be admitted to each of the two schools under their respective admission procedures and standards and indicate an intention to pursue the dual degree. Students will take all the core courses and the capstone required for an MPA, plus the core and concentration requirements necessary for the MURP.

Students in each school must apply to the other school before completing 18 hours in their respective programs. Upon admission to both schools, students will be assigned an advisor in each school to work out a specific degree plan.

Core and Elective Requirements

Core Courses (42 semester hours)

MURP

- URPL 5000 - Planning History and Theory
- URPL 6220 - Advanced Research Techniques
- URPL 6215 - Analyzing the Built Environment

- URPL 5020 - Planning Law and Institutions
- URPL 6000 - Planning Project Studio

Total: 18 Hours

MPA

- PUAD 5001 - Introduction to Public Administration and Public Service
- PUAD 5002 - Organizational Management and Behavior
- PUAD 5004 - Economics and Public Finance
- PUAD 5005 - The Policy Process and Democracy
- PUAD 5006 - Public Service Leadership

Total: 15 Hours

Take one of two

- PUAD 5003 - Research and Analytic Methods
- URPL 5040 - Urban Sustainability

Total: 3 Hours

Additional Course Work (21 semester hours)

MURP

12 hours if URPL 5510 elected, or 15 hours if PUAD 5003 elected. Courses are to be selected with MURP advisor's approval.

- URPL 5040 - Urban Sustainability
- PUAD 5003 - Research and Analytic Methods

Total: 12-15 Hours

MPA

6 hours if PUAD 5003 elected, or 9 hours if URPL 5510 elected.

- PUAD 5003 - Research and Analytic Methods
- URPL 5040 - Urban Sustainability

Total: 6-9 Hours

Practicum

- PUAD 5361 - Capstone Seminar (3 hours required)

Total: 3 Hours (required)

Electives

Take one of the following or another option with MPA advisor's approval (3 hours):

- PUAD 5250 - Intergovernmental Management
- PUAD 5410 - Administrative Law
- PUAD 5440 - Negotiation and Conflict Resolution
- PUAD 5502 - Public Financial Management and Policy
- PUAD 5503 - Public Budgeting and Finance
- PUAD 5540 - Organization Development
- PUAD 5625 - Local Government Management
- PUAD 5626 - Local Government Politics and Policy
- PUAD 5631 - Seminar in Environmental Politics and Policy
- PUAD 5632 - Seminar in Environmental Management

Total: 3 Hours

Public Affairs BA/MPA

The BA/MPA degree program offered by the College of Liberal Arts and Sciences and the School of Public Affairs provides students the opportunity to complete both a bachelor's degree and master's degree in five years rather than the usual six years. The program combines undergraduate general education and major studies with a specialized curriculum in public affairs and strives to develop intellectual and professional skills in a coordinated manner. The five year BA/MPA program decreases the time and number of semester hours required to earn both degrees by allowing students to count graduate level courses in the School of Public Affairs toward the bachelor's degree requirements. The program is designed to give students an opportunity to prepare for professional positions and advancement with federal, state or local governments, nonprofits or private sector firms concerned or involved with public affairs.

Admissions Requirements and Recommendations

Interested students should contact their CLAS advisor and the School of Public Affairs' MPA director as early as possible to ensure proper planning for the five year degree. To qualify, students must have a 3.5 or higher GPA in CLAS.

Students may apply to the program during the semester in which they will successfully complete 90 semester hours, and should have most of their general education and major requirements completed by this time. Students must complete all the required MPA application materials for the School of Public Affairs.

Program Requirements

Students must fulfill all the requirements for graduation for CLAS:

- Total of 120 hours (includes hours in public affairs)

- 30 hours in the core curriculum
- 30-48 hours to satisfy major requirements
- Writing proficiency (1 - 7 hours)
- Mathematics proficiency (0 - 3 hours)
- Level III foreign language (0 - 13 hours)
- It is highly recommended that students complete a course in American government, statistics and economics before applying to the MPA program

Students must maintain a 3.5 GPA in CLAS course work.

Students may complete a maximum of 18 semester hours of SPA graduate course work while classified as an undergraduate student.

Students must fulfill all the requirements for graduation from SPA:

- Total of 36-39 semester hours in public affairs
- Six core courses (PUAD 5001 - PUAD 5006)
- Five elective courses at the graduate level (5000 and 6000 level courses)
- Nine of the 15 elective semester hours must be PUAD courses
- An internship (3 hours) is required from those who do not have significant work experience in the field
- Successful completion of the capstone course taken in a semester AFTER all core courses are completed. A thesis option is available. Interested students should contact their SPA faculty advisor.

Students must maintain a 3.0 or higher GPA in public affairs course work.

Program Options

BA/MPA students may choose from any CLAS major.

BA/MPA students may choose to do a general MPA or select a MPA concentration in local government, nonprofit management, environmental policy, emergency management and homeland security or domestic violence.

Degree Confirmation

Students are eligible to receive a bachelor's degree once they have successfully completed 120 semester hours and all CLAS requirements. The BA/MPA will be conferred once the student has completed all requirements of the master of public administration degree, including at least 36 hours of graduate level course work.

Doctoral Programs

Applied Mathematics PhD

► Graduate School Rules apply to this program.

Program Requirements

The Department of Mathematical and Statistical Sciences offers a PhD in Applied Mathematics. The degree is designed to give candidates a contemporary, comprehensive education in applied mathematics and to provide research opportunities in the special fields of graph theory, combinatorics, optimization, applied probability, computational mathematics, and applied statistics.

There are six phases of the PhD program. A candidate must fulfill course requirements, pass the preliminary examinations, establish a PhD committee, meet the academic residency requirement, pass the comprehensive examination and write and defend a dissertation.

- Students must complete 42 semester hours of non-thesis course work at the graduate level (up to 30 hours of this course work may be transferred in, including courses taken as part of a master's degree). In addition, 30 hours of dissertation credit must be taken. The following courses are required as part of the formal course work: the math clinic and three readings courses (1 semester hour each). Students must also satisfy a **breadth requirement** by completing a total of six graduate math courses from among several areas of mathematics, with no more than three of these courses from any one area. A 3.25 GPA must be maintained throughout all course work. [The following MATH courses will NOT count toward a graduate degree: MATH 5000-5009, 5010, 5012-5015, 5017, 5198, 5250 and 5830.]
- The preliminary examinations are designed to determine that students who intend to pursue the PhD program are qualified to do so. These four-hour written examinations are in the areas of applied analysis and applied linear algebra. Students must pass these exams by the start of their fourth semester.
- Six semesters of full-time scholarly work are required, as specified in the rules of the Graduate School. All students are strongly advised to spend at least one year doing full-time course work or research with no outside employment.
- The comprehensive examination is taken after completion of the preliminary exams, completion of at least three semesters of residency, and upon completion of all non-thesis coursework. The exam is designed to determine mastery of graduate-level mathematics and the ability to embark on dissertation research. It consists of a six-hour written examination and an oral follow-up examination. Students must pass the comprehensive exam within 4 years of admission. Within six months after passing the comprehensive examination, the candidate must present a dissertation proposal to their dissertation committee.
- Each student must write and defend a dissertation containing original contributions and evidence of significant scholarship. The dissertation defense is public and must be given before an examining committee approved by the Graduate School.

For more detailed information about the Applied Mathematics PhD, see www.math.ucdenver.edu/phd.

Bioengineering PhD

- Graduate School Rules apply to this program.

Doctor of Philosophy (PhD) Degree Program

The PhD is offered to students with an undergraduate or master's degree in engineering or the life sciences. Students complete the degree in three to five years with a highly individualized training pathway. All PhD students complete a dissertation, which may have an industry component.

The department also offers an MD/PhD degree program for students already enrolled or accepted into the Medical Scientist Training Program (MSTP) in the CU School of Medicine. Degree completion in 7-8 years with highly individualized training pathway and multidisciplinary research dissertation.

Visit our website (ucdenver.edu/bioengineering) or contact us at bioengineering@ucdenver.edu for more information.

Civil Engineering PhD

► Graduate School Rules apply to this program

The PhD degree in civil engineering is offered through a coordinated program with University of Colorado Boulder.

Specialty Areas for Degrees:

- Environmental and Sustainability Engineering
- Geotechnical Engineering
- Hydrologic and Hydraulic Engineering
- Structural Engineering
- Transportation Engineering
- Civil Engineering Systems

Note: The multidisciplinary engineering and applied science PhD is also offered through the Department of Civil Engineering.

What is civil engineering systems?

The doctoral program in civil engineering systems has different rules than the five other traditional doctoral tracks in order to facilitate more interdisciplinary research. This doctoral track can be the degree that would follow a master's of engineering.

Additional Doctoral Admissions Requirements

In addition to the admissions requirements listed for master's students, doctoral applicants need to have the support of a faculty advisor before they are admitted. Once doctoral students are approved by the graduate admissions committee, their application must be reviewed again by the Department of Civil, Environmental and Architectural Engineering at CU Boulder as the programs are jointly administered. Prospective PhD students should contact the Department of Civil Engineering at CU Denver to inquire about application requirements and to obtain the "Rules and Policies for the Coordinated PhD Program."

Requests for applications for graduate study in civil engineering should be addressed to

CU Denver Department of Civil Engineering
Campus Box 113
P.O. Box 173364
Denver, CO 80217-3364

Computer Science and Information Systems PhD

► Graduate School Rules apply to this program

Program co-directors: Gita Alaghband (CSE) and Mike Mannino (Business School)

Website: engineering.ucdenver.edu/CSISPhD

The CSIS PhD degree is designed to provide an infrastructure for a wide spectrum of research possibilities in the computer science and information systems field. It is offered jointly through the Department of Computer Science and Engineering (housed in the College of Engineering and Applied Science) and the Information Systems program (housed in the Business School.)

The CS track emphasizes the scientific, algorithmic, system design and computing aspects of the field, while the IS track has a major emphasis on information management and the entrepreneurial side of the field. The two tracks intersect through some graduate-level course work, research, and committee memberships to provide a broad perspective of research and development in IT for students.

The PhD degree is granted by the College of Engineering and Applied Science for those focused on the CS track and by the Business School for those focused on the IS track. The program is multidisciplinary by nature, and while it supports basic research in computer science and in information systems in the traditional sense, the thrust of the program is collaborative research within the program and with other institutions. Our students work with research centers and researchers from variety of disciplines, including the CU School of Medicine, chemistry, mathematics, biology, all engineering disciplines, economics, health, and education, in addition to industry and businesses. This distinctive infrastructure supports basic research in both CS and IS as well as the demand of computing and IT integration with all other scientific and business fields.

Admission Requirements

For more information regarding the admission requirements for the CSIS PhD, visit engineering.ucdenver.edu/CSISPhD.

Advisor

Upon entering the program, each student chooses an advisor to provide mentoring and guidance throughout the program and work with the student to prepare a program of study. Requests to change advisors must be approved by the program co-directors, and this happens in very rare circumstances.

Doctoral Committee

The advisor and four other members form a doctoral committee. To foster interdisciplinary work, you may have your doctoral research co-supervised by two faculty members. At least one co-supervisor must be a full-time current graduate faculty member in the CSE department or Business School. The committee must contain at least one faculty member from the CSE department and at least one from the Business School. At least one committee member is from outside of the CSE department and the information systems faculty. One committee member may be from outside the CSE department and the information systems faculty.

Program Components

Plan of Study

A list of course work and other requirements for the degree should be prepared with the advisor and then submitted to the co-directors for approval. The successful completion of all work indicated on the plan of study is an important prerequisite for the conferring of the degree. A plan of study should be submitted for approval by the end of the first semester of the program. The current plan of study should be updated before the beginning of the second year of the program and submitted for reapproval by the co-directors.

Preliminary Exam

According to Graduate School Rules, students are required to demonstrate their basic knowledge and preparation toward more advanced doctoral level work. For more information visit the PhD CSIS website at engineering.ucdenver.edu/CSISPhD

Comprehensive Exam

Students will submit a paper to fulfill the graduate school's comprehensive exam requirement. The paper should describe an area of research including literature review, problem definition, and possible methodologies/models to study a significant problem in computer science or information systems. The paper will be evaluated by a committee of three faculty members. An oral presentation of the paper will be open to the entire CSIS faculty. The committee may adopt additional guidelines to evaluate the paper and presentation. According to graduate school rules, the comprehensive exam must be completed by the end of the fourth year in the program. In addition to these requirements, the comprehensive exam must meet the other graduate school requirements.

Dissertation Proposal (if determined by the comprehensive exam committee)

A student's doctoral committee can require a dissertation proposal after the student completes the comprehensive exam. The doctoral committee may consider the quality and level of detail in the comprehensive paper and other factors in determining the need for a student to prepare a dissertation proposal. If the doctoral committee requires a dissertation proposal, the student must prepare a proposal that will be evaluated by the doctoral committee.

Dissertation Completion

Once the dissertation proposal is approved, each student prepares and submits a dissertation. The dissertation is defended before the doctoral committee in a public meeting. Final approval for the dissertation is given by a vote of the dissertation committee after the public defense.

Graduation

Upon completion of all degree requirements including the dissertation defense, the student receives the degree of doctor of philosophy. Students applying through CSE receive the PhD from the College of Engineering and Applied Science, while students applying through information systems receive the PhD from the Business School.

Computer Science and Information Systems PhD (Business School)

- Graduate School Rules apply to this program.

Program Components

Plan of Study

A list of course work and other requirements for the degree should be prepared with the advisor and submitted to the program co-directors for approval. The successful completion of all work indicated on the plan of study is an important prerequisite for the conferring of the degree. A plan of study should be submitted for approval by the end of the first semester of the program. The current plan of study should be updated before the beginning of the second year of the program and submitted for reapproval to the co-directors.

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According to Graduate School rules, students are required to demonstrate their basic knowledge and preparation toward more advanced doctoral level work. For more information visit the CSIS program website.

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Dissertation Proposal

As the first phase of the dissertation, each student should prepare a proposal that will be evaluated by the doctoral committee. A proposal should be ready for review at least one semester before the expected completion date of the degree. The proposal is submitted for review and approval by the doctoral committee. An oral presentation of the dissertation proposal before the doctoral committee is required for approval. An approved proposal is then submitted to the co-directors of the program for final approval.

University-Level Instructional Training

During the program, each student will obtain training for university-level instruction. This requirement can be fulfilled by working with a faculty member as a teaching assistant, attending university-level teacher training or teaching a university-level class. Students who plan a university career will be encouraged to teach one or more courses and participate in training. When teaching or working as a teaching assistant, a student will be compensated according to standard university salaries.

Dissertation Completion

Following completion of the approval of the dissertation proposal, each student prepares and then submits a dissertation. The dissertation is defended before the doctoral committee in a public meeting. Final approval for the dissertation is given by a vote of the dissertation committee after the public defense of the dissertation.

Graduation

Upon completion of all degree requirements, including the dissertation defense, the student receives the degree of doctor of philosophy. Students applying through the CSE receive the PhD from the College of Engineering and Applied Science, while students applying through the information systems program receive the PhD from the Business School.

Design and Planning PhD

► Graduate School Rules apply to this program

Telephone: 303-315-0032

Email: o.attmann@ucdenver.edu

Overview

The PhD in Design and Planning at the University of Colorado is a research-oriented degree offered by the College of Architecture and Planning (CAP) at the University of Colorado Denver. Initiated in 1997, the program is dedicated to the education of future architects, landscape architects, and urban planners who are intellectual leaders, and who have a critical understanding of the social, political, and global conditions that influence their profession.

It is the intent of the program to prepare students to excel in the planning and design of built environments through the incorporation of intellectual, analytical, and integrative aspects of the involved professions. Within this context, students and faculty seek to creatively shape the built environment and understand it in relation to institutional, political, economic, social, and natural environments.

Admission to the program is competitive and based on merit and available funded projects in the program. Excellent academic performance, references, and GRE scores are prerequisites. In the first two years of residence, students take courses to satisfy the requirements of a major and a minor field of study and the core requirement of the program, as well as additional electives.

The minimum residency requirement is four semesters, not including summer semesters. The first major step in their progress through the program is the completion of the course work required by the candidate's selected major and minor fields of study. The second major step is the completion of the comprehensive examinations in the selected major and minor fields of study.

After satisfying program requirements, students move on to preparing a thesis topic and research proposal which is presented and defended in a public event. With the successful defense of the thesis topic and research proposal, students are admitted to candidacy. Finally, the completed thesis is defended in a public

examination involving external examiners in addition to the members of the committee. Upon successful completion of the thesis defense the program recommends the awarding of the PhD degree.

One of the strengths of the College of Architecture and Planning PhD program is that students can take advantage of resources in all departments and fields in the College and elsewhere in the university. The program is a unique, joint program in which students may choose to focus in Architecture, Planning, or Landscape Architecture, or work in any combination of these disciplines. Interdisciplinary study and cross-disciplinary inquiry occur in a congenial work environment, drawing upon a wealth of faculty and resources in a range of campus units. The main mission of the program is to provide a foundation for scholarship in planning and design drawing from scientific, critical, historical, and creative modes of inquiry.

The PhD degree in Planning and Design is appropriate for those seeking careers in research and teaching or in roles in government or professional consultation, all of which require a research specialization. So far, over 40 graduates of the program have gone on to faculty positions at universities in the United States and elsewhere, post-doctoral work, and into private consulting, non-profit organizations, and the federal government.

Admission Requirements

Prerequisites

Applicants admitted to the PhD Program normally will have completed the requirements for the Master of Architecture, Master of Planning, Master of Landscape Architecture, or a related master's degree program. Students from allied fields are also encouraged to apply. Field specialization and background are open. However, students will preferably have completed a program in planning or a design-related field, such as:

- Architecture
- Architectural Engineering
- City and Regional Planning
- Landscape Architecture
- Urban Design
- Environmental Studies

GPA, GRE and TOEFL Scores

Consistent with the University requirements, applications are evaluated based on Grade Point Average (GPA) scores, Graduate Record of Examination (GRE) scores, and the Test of English as a Foreign Language (TOEFL) scores (where applicable). All exams must have been taken within a year before applying to the program:

- Academic achievement as evidenced by an undergraduate grade point average of 3.0 (on a 4.0 scale) or better, and a graduate grade point average of 3.5 or better.
- The program looks for GRE scores of 158 or better on each of verbal and quantitative reasoning tests and for a minimum of a 4.00 score on analytical writing, unless a student's record documents substantial professional or scholarly achievement as evidence of exceptional ability.
- Applicants whose native language is not English must take either the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exam, or have

a graduate degree from a university in the U.S. or another English-speaking country. The minimum TOEFL score required for acceptance by the University of Colorado at Denver is 80 or higher on the TOEFL (sub-scores of 20 in Reading, Listening, and Speaking, and 24 in Writing) or 6.5 on the IELTS (sub-scores of 5.5 in each area). However, the PhD program typically does not accept a student with a score lower than 85 on the TOEFL and 6.8 on the IELTS.

Application Checklist

The following documents must be submitted before an application will be considered:

- Application Forms - Apply online!
- Application Fee
- Three Letters of Recommendation
- Examples of previous research and written works
- Official transcripts from all previously attended institutions of higher learning
- Statement of Personal and Professional Goals
- Scores of Test of English as a Foreign Language (TOEFL) for non-U.S. residents whose native language is other than English
- Graduate Record Examination (GRE) score
- Financial Statement (for non-U.S. residents/citizens)

Program Requirements

Overview

Successful completion of the PhD program requires fulfilling course requirements, passing the comprehensive examinations, preparing and defending a dissertation proposal, and undertaking research, writing and defending a dissertation. This is a multi-year process that involves a close mentoring relationship with the student's advisor. The Checklist that follows summarizes the major requirements of the program.

A student's program of study must include:

- at least 12 credit hours of PhD Program core classes,
- 15 credit hours of study in a Major field, and
- 9 hours in a Minor field.

The Major and Minor requirements are minimums; the particular field of study may require additional work.

Based on these and other requirements, students shall complete a minimum of 36 credit hours in their Major and Minor fields, and PhD Program core requirements prior to advancement to candidacy. This is the equivalent of four semesters (two years) of coursework.

Students must maintain a 3.0 GPA in all their coursework. A grade of less than B in any PhD Program requirement (Core, Major and Minor) will not be accepted as meeting those requirements. For Program Core courses, the student must retake the course. A Program Core course may only be retaken once. The student will be terminated from the program if a grade less than B is received more than once in a PhD Program Core course.

In addition, students must pass a comprehensive exam as well as write and defend a dissertation proposal and dissertation.

Residency and Enrollment Requirements

The minimum enrollment requirement at CU Denver for doctoral students is six semesters of full time scholarly work beyond the attainment of a bachelor's degree. Two semesters of enrollment credit may be allowed for an earned Master's degree from another institution however, at least four semesters of credit must be earned for work performed while enrolled at CU Denver.

The doctoral program requires a minimum of two years of residency (not fewer than four semesters enrolled in a minimum of six credit hours each, excluding summer) devoted to coursework and other preparation for advancement to doctoral candidacy status. Ordinarily, research for the dissertation will also be completed while in residence. After that time, special arrangements can be made with the CAP PhD Committee if substantial work needs to be performed elsewhere.

Students must complete the comprehensive examinations and dissertation proposal within four years from the beginning of their first semester in which they are enrolled as a PhD student at University of Colorado Denver. In addition, University of Colorado Denver requires that all degree requirements be completed within eight years of matriculation.

Active Status

To remain actively enrolled, students must register for six credit hours or more each academic semester (excluding summer) until they become a doctoral candidate. Students who are not so registered are automatically withdrawn from the University of Colorado Denver and must apply for readmission to the program. The readmission decision will depend on the student's academic record and progress toward the degree.

Doctoral students must register for a minimum of one hour of dissertation credit in the term of graduation. If all requirements for graduation, including submission of the final approved dissertation, have been completed prior to the last day of registration, and the student was registered for the preceding term, the student may apply for a waiver of the enrollment requirement.

Advising and Committees

Overview

Each student entering the program will have a PhD advisor. Students wishing to change their advisor should do so during their first year. All appointments of advisors must be approved by the PhD Program Director. Students wishing to change their advisor after the first year must petition the PhD Program Director for approval.

The Advisor

The advisor guides the student through the completion of the course requirements, the preparation for the comprehensive examinations, the dissertation proposal, and the dissertation. The advisor must have a doctoral degree and be a tenured/tenure-track member of the CAP PhD program.

Dissertation Advisory Committee

The Dissertation Advisory Committee provides guidance for the investigated dissertation topic, comprehensive examination, dissertation, and the final dissertation examination.

This committee includes at least three faculty members: the advisor and two additional members. Including the advisor, the majority of the committee members must be full-time faculty members of CAP, and the majority of the committee members must have a PhD degree.

Membership of this committee may change if the student's interests and needs change. Any changes should be developed in consultation with the student's advisor, and must be approved by the PhD Program Director.

Comprehensive Examination Committee

This committee consists of a minimum of three graduate faculty members, including the advisor. Although it is not a requirement, this committee should mainly consist of the Dissertation Advisory Committee. Including the advisor, the majority of the committee members must be full-time faculty members of CAP, and the majority of the committee members must have a PhD degree. For the comprehensive examination, at least one member must represent the student's major field of study, and at least one member must represent the minor field of study.

Final Dissertation Examination Committee

This committee consists of a minimum of five members, including the advisor, the Dissertation Advisory Committee for the dissertation, and at least two additional external members, with at least one from outside the University of Colorado Denver. External members must be full time faculty members in a degree-granting institution and must have PhD degrees.

Special Circumstances

If the advisor leaves the faculty of CAP before the comprehensive exam and/or thesis topic is approved, the PhD Program Director will work with the student to identify a new advisor for the committee.

If the advisor leaves the faculty of CAP after the comprehensive exam and/or thesis topic is approved, and both the advisor and the student wish to continue in the advising relationship, there will be no change of advisor. The advisor may be appointed as adjunct faculty in the School, in order to recognize his or her continuing role, with approval of the PhD Program Director.

If a member of the dissertation committee other than the advisor is unable to continue in this role, for any reason, the advisor will work with the student to identify a new member for the committee. Upon accepting to serve in this role, the new member of the committee must sign on the dissertation topic and dissertation proposal documents as they were previously approved.

Up to one member of a Dissertation Advisory Committee and up to one member of the Comprehensive Exam Committee without a PhD will be allowed upon a majority vote of the PhD Faculty.

Curriculum

The minimum requirement is 36 semester hours of coursework, all of which must be at the Graduate level (5000 and above) and 30 hours of dissertation semester hours. All PhD students are required to take 12 semester hours of core courses.

The curriculum is divided into three stages consisting of core courses, major and minor field courses, and the dissertation. The program requires a minimum of 66 semester hours of graduate work, 36 of which must be earned while in residence.

Each student's curriculum is tailored to his/her individual needs and is determined in close consultation with the dissertation advisor. Within their area of specialization, students will identify a major area of study and an outside field of study. All students are required to enroll in the PhD colloquium and Research Methods core courses during the first and second years of course work.

Core Courses (12 semester hours, minimum with B or better grade)

- PhD colloquium 1 (1 semester hour)
- PhD colloquium 2 (1 semester hour)
- PhD colloquium 3 (1 semester hour)
- PhD colloquium 4 (1 semester hour)
- Literature Review survey with the committee chair (2 semester hours total)
- Two Research Methods courses (3 semester hours each)

Major Field of Study (15 semester hours, minimum of B or better grade)

The Major Field encourages students to individualize their course of study by focusing on an area of scholarship within the specialized field. Major Advisors will work with the student to develop a course of study appropriate to the field.

Minor Area of Study (9 semester hours, minimum of B or better grade)

The Minor Area encourages students to individualize their course of study by focusing on an area of scholarship outside of the specialized field. The minor area may involve substantive research questions or it may focus on methodological approaches that can be related to the substantive concerns found in the major.

Additional Courses (variable): (30 semester hours, minimum of B or better grade)

During the course of doctoral study, students may enroll for credits related to their preparation for comprehensive exams, the dissertation proposal and preparation, or advisor approved independent study.

Typical Course of Study

FIRST YEAR

Students develop their degree plan, take six credit hours of the required Core Curriculum, complete additional courses in their specialty area, and any prerequisite courses.

SECOND YEAR

Students take the remaining core courses, continue to take electives in their minor and specialty areas, begin literature surveys and reviews, and prepare for their comprehensive exam.

THIRD YEAR

Students complete their specialization papers, prepare a dissertation proposal, complete literature review, and take the comprehensive exam.

FOURTH/FIFTH YEAR

Fourth and fifth years are spent researching and writing the dissertation.

PhD Degree Time Limit: Eight Year Completion Requirement

University of Colorado Denver requires that doctoral students, whether enrolled full time or part time, must complete all degree requirements within eight years of matriculation. Students who fail to complete the degree in this eight-year period are subject to termination from the Graduate School upon the recommendation of the program director and concurrence of the Dean. For a student to continue beyond the time limit, the program director must petition the Dean for an extension and include:

1. reasons why the program faculty believes the student should be allowed to continue in the program and
2. an anticipated timeline for completion of the degree.

Approved leaves of absence do not automatically extend the time limits for earning a degree, but they may be used as a reason to request an extension if needed.

For more information on the PhD in Design and Planning, visit the College of Architecture and Planning website.

Education and Human Development PhD

► Graduate School Rules apply to this program

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Website: <http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/Doctorate/Pages/PhD.aspx>

The PhD in education and human development links an intensive research-based course of study with a content area specialization in order to prepare candidates to assume faculty positions in institutions of higher education or research-based organizations. Successful applicants will be paired with a faculty mentor who will engage the students in research, development, service, and other forms of professional activity.

You will complete a plan of study that includes at least 45 semester credits of coursework (including all required core courses) and 30 semester credits of dissertation. The PhD program is designed to provide each student with an induction into the university research and teaching culture. PhD coursework is intensive and substantive, requiring significant writing, analysis, and critiquing of theory and professional literature.

Overview of Course Work:

The PhD program consists of a minimum of 75 semester credits. Total credits may vary in order to fully prepare for career opportunities. Students complete 45 credits in three core areas outlined below. The final 30 credits are completed through the dissertation.

12 credits - Foundation courses/experiences: Equity and Diversity; Learning; Epistemology; and Teaching in Higher Education

18 credits - Research Methods

15 credits - Concentration Area (see the list options below)

30 credits - Dissertation

Doctoral students complete a series of courses/experiences in a specified concentration area. Concentration areas focus on a defined discipline or content area in preparation for professional roles as researchers and faculty members.

The following concentration areas are available.

Administrative Leadership and Policy. This concentration serves as key area for those concerned about leadership in schools and a key focus for research by scholars in higher education. A crucial assumption the underlies this concentration area is that school leadership makes the difference in how schools succeed in improving learning outcomes for all students, but we are only beginning to scratch the surface in understanding why leadership is successful when it is, what the interactions are between effective leadership and effective teaching, and their collective impact on learning outcomes at all levels in schools.

Early Childhood Special Education/Early Childhood Education. The goal of this concentration area is to introduce students to issues and practices in early childhood special education/early childhood education and to prepare students to provide leadership to improve outcomes for all children including children with disabilities across early childhood settings. Students will obtain the skills and knowledge of evidence-based practices needed to meet state and national leadership needs within institutions of higher education to address issues in ECE/ECSE. Graduates will: conduct rigorous research related to culturally responsive, evidence-based practices; translate research into practice, thus expanding the use of evidence-based practice in the field; and, create, evaluate, and improve pre-service teacher education programs in ECE and ECSE.

Family Science and Human Development. The goal of this concentration is to prepare students to critically examine and understand family science within an ecological life span development lens. This program prepares students to work in academic careers as professors, researchers and scholars in Family Science and Human Development. Students are provided a rich curriculum that centers on theoretical and scholarly based knowledge in family science, human development and research inquiry. Another objective of this program is to integrate the importance of family diversity (which includes race, ethnicity, culture, class, gender, sexual orientation, age, religion, ability and language) into the curriculum as it relates to

social justice in family science and child, adolescent and adult development. Central to the Family Science and Human Development concentration is the conceptual framework of family and human ecological systems and how that impacts research, practice and policy with diverse families in the United States and at the global level.

Math Education. Students and faculty in this concentration area focus on teacher learning and professional development experiences. Specifically, projects investigate the ways that particular interventions used in professional development for mathematics teachers impacts their content knowledge and pedagogical practices in their classrooms. Work in this area is framed by a situative perspective of learning and incorporates mixed methods to answer questions around the ways particular interventions support teacher and student learning. Video data is prominent in both the design of professional development interventions as well as a major data source for analyses. Analytic methods vary based on the research question and grain size.

Research, Assessment and Evaluation. The goal of this concentration area is to prepare students to design and carry out significant applied research on individual and organizational change in the field of education and human development. Through problem-based pedagogy and hands-on learning, students will be prepared to be collaborative applied researchers who work with community, university and school partners. Students will learn advanced quantitative, advanced qualitative and mixed methods research techniques. Course content includes mixed methods, advanced statistics, advanced qualitative data analysis, systems analysis, collaborative team research and practicum experiences. Graduates of the program are prepared to work as faculty members, school district and organizational researchers, data analysts and assessment coordinators.

Science Education. The goal of this area is to prepare students to explore, understand, and think critically about the nature of science and science education from a largely research-oriented perspective. Students may elect to focus on environmental science education as an area of specialization within this concentration area through electives and discipline- specific research agendas.

Urban Ecologies. This concentration area brings together several faculty members in interdisciplinary study of education in urban ecologies. Participating faculty members are aligned with the interdisciplinary concentration area as a whole, rather than specific threads or foci. The philosophical assumptions underlying work in this concentration area are: 1) Cultural groups are not monolithic, 2) Urban life and learning, including Pre-K-20 education, complex phenomena that benefit from the multiple lenses offered by multi-disciplinarity, and 3) Trans-nationalism characterizes the cultural experiences and political/economic realities of many communities in cities and contributes to the hybrid identities of residents. These assumptions contribute to a conceptual frame for investigating diversity within the city that is not focused on specific groups and is concerned with the influence of globalization on communities in general within the city. Experiences of and issues confronting different cultural and ethno-linguistic groups will be the key content of this concentration area.

Engineering and Applied Science PhD

Graduate School Rules apply to this program

The multidisciplinary Engineering and Applied Science Doctor of Philosophy degree program is offered by the College of Engineering and Applied Science and consists of a primary and secondary concentration.

Applicants apply and enter the program through one of four departments, called the host department, which is chosen based on the applicant's intended primary concentration of study. The four departments that serve as host departments are:

- Civil Engineering
- Computer Science and Engineering
- Electrical Engineering
- Mechanical Engineering

Each host department offers several concentrations. A list of concentrations can be found on each department's website. Go to **engineering.ucdenver.edu** to learn more.

The required secondary concentration can be chosen from any remaining department within the college, including the Department of Bioengineering. The secondary concentration may also be chosen from another CU Denver school or college. A student chooses his/her secondary concentration with the help of a faculty advisor after entering the program.

Requirements for Admission

Requirements for admission to the Engineering and Applied Science PhD program can be found under the Degree Programs link on each host department's website.

- Civil Engineering (engineering.ucdenver.edu/civil)
- Computer Science and Engineering (engineering.ucdenver.edu/cse)
- Electrical Engineering (engineering.ucdenver.edu/electrical)
- Mechanical Engineering (engineering.ucdenver.edu/mechanical)

Degree Requirements

The minimum degree requirements consist of 30 semester hours of course work in the primary and secondary areas of concentration, as well as 30 semester hours of research/dissertation credit. Each candidate for the degree is expected to take a preliminary examination by the end of the second year. After successful completion of this exam, the student is required to take the comprehensive examination and the doctoral dissertation defense examination. Additional requirements are outlined in the Rules and Regulations document that each student signs after being admitted to the program. Each student must also satisfy the degree requirements of the CU Denver Graduate School.

Health and Behavioral Sciences PhD

- Graduate School Rules apply to this program

Requirements for Admission

A master's or equivalent graduate degree is required for admission to the PhD program. In addition, we encourage prior graduate training in the areas noted below. Students applying without prerequisites may be admitted, but will be required to complete appropriate courses before being permitted to complete the core curriculum.

In addition to the general admission requirements of the Graduate School, the specific admission requirements for the PhD in health and behavioral sciences are as follows:

1. Knowledge from prior course work or vocational experience at the equivalent of college senior or graduate level in each of the following areas.

Social or behavioral sciences (15 semester hours minimum): knowledge of essential facts and concepts concerning the relationship among individuals and society, social organization, individual psychology and the relationship among culture, belief and behavior. This could be satisfied by course work in psychology, sociology and anthropology.

Human biology or physiology (3 semester hours minimum): familiarity with the functioning of the human body in health and disease states, including an understanding of cellular and organ system processes; an appreciation of evolutionary theory and the mechanisms by which evolution operates on both cellular and population levels; and an understanding of the interplay between the evolution of disease and host response. This could be satisfied by course work in human biology, physiology, pathophysiology or biological anthropology.

Statistics (3 semester hours minimum): prior course work and current familiarity with statistics including probability theory, parametric and nonparametric methods and acquaintance with basic multivariate techniques.

Epidemiology (3 semester hours minimum): prior course work at the advanced undergraduate or graduate level with the basic concepts and methods of epidemiology, including measures of risk, mortality, distribution of disease, role of bias and confounders and study design.

2. Demonstrated academic excellence as evidenced by an undergraduate GPA of 3.25 (out of a possible 4.0 points) or better, a graduate GPA of 3.5 or better, and scores in the top 30th percentile (averaged) of the GRE. Admission to the program is highly competitive; minimum GPAs and GRE scores for acceptance in any given year may be higher than the minimum levels indicated here.

The applicability of a student's prior course work will be decided by the program executive committee after reviewing the student's transcript and additional materials. If the student does not have the requisite educational background or GPA, the student may be admitted on a conditional or provisional basis and additional course work required in accordance with Graduate School Rules.

Prospective students should not be dissuaded from applying to the program if they do not meet all of the requirements for admission. In some cases, employment experience may be counted toward meeting a requirement. In other cases, students may be admitted conditionally upon their completion of a list of prerequisite courses that will be established at the time of admission. Students should be sure to address this issue in completing the graduate application by specifying the academic and vocational experience they possess that meets, in part or full, the admission requirements described above.

MASTER'S LEVEL PREPARATION FOR THE DOCTORAL PROGRAM IN HEALTH AND BEHAVIORAL SCIENCES

The program does not currently offer master's-level training in HBSC. Instead, we urge interested applicants to pursue relevant master's degree training in one of the social, behavioral or health sciences disciplines. In addition, we work closely with two master's programs at CU Denver. These are the concentrations in medical anthropology within the anthropology MA program offered by the anthropology

department and the master of public health offered by the Colorado School of Public Health. Contact the respective programs for more information on these degree options and our program for how their requirements articulate with those for the health and behavioral sciences PhD.

TO APPLY FOR ADMISSION

At the Denver campus, all graduate applications are now submitted electronically. To begin the application process, go to the online admissions website. If you have any difficulties, call the program assistant at 303-556-4300. The program admits students only for the fall semester, which typically begins in mid- to late August. The deadline for the receipt of all application materials is **February 15** for admission the following August.

Applicants should invest considerable thought and effort in preparing their application. For instance, in the essay (Part II, question six) applicants should provide information on: (a) their academic training and any employment related to public health or health care; (b) their experiences with inter- and multidisciplinary perspectives, and (c) how they envision using their doctoral degree to improve the health status of human populations and individuals. Students should also indicate the kinds of research *foci* that interest them the most.

In addition to the required recommendation form, letters of recommendation are required from at least three individuals in a position to judge the applicant's ability to complete the program. Recommenders may be employers, colleagues or professors; however, the applicant should be sure that the letters address the quality of and aptitude for academic work as well as personal characteristics and qualities.

Financial Aid

There are four kinds of financial aid available: graduate student stipends/fellowships; tuition assistance; research assistantship positions funded by grants to specific program faculty; and the regular package of financial aid (primarily loans) available through the financial aid office.

Newly admitted, out-of-state and students demonstrating outstanding scholastic achievement receive priority when assigning departmental sources of funding. Students interested in research assistantships should contact the individual faculty member with whom they wish to work regarding potential assistantship positions.

All other aid should be requested through the CU Denver Financial Aid Office.

Program Requirements

There are three dimensions to the required curriculum:

- a. A core curriculum that focuses on problem-oriented, interdisciplinary approaches to theory and method
- b. Elective course work intended to provide the student with a solid base from which to launch the dissertation research
- c. Dissertation research and writing

The curriculum is subject to change. What appears below is intended to give students a general idea of the extent, shape and content of the curriculum. Students should check with the program office for up-to-date information on specific course requirements and scheduling.

The Core Curriculum

The core curriculum should be completed by students by the end of their second year of full-time study. It consists of the following series of courses which, together, constitute 29 semester hours:

I. Health and Behavioral Sciences Colloquium

Each fall, the HBSC program will organize a series of presentations by scholars working in the health and behavioral sciences. The presentations provide students with the most current science and theory in the field. Required of all first- and second-year students, who must take at least two times.

- HBSC 7001 - Colloquium Series in the Health and Behavioral Sciences

Total: 2 Hours

II. Theoretical Perspectives in the Health and Behavioral Sciences

This series is designed to give students a thorough background in how the principles of the social and behavioral sciences have been applied to health issues. Topics include: the interplay between structure and agency in creating and maintaining health; social epidemiology; critical theory and social determinants of health; issues affecting Western biomedicine and public health systems; diffusion of healthy behavioral change among populations; social construction of health and illness; health policy and bioethics; social networks; and stress.

- HBSC 7011 - Theoretical Perspectives in Health and Behavioral Science I
- HBSC 7021 - Theory in Health and Behavioral Sciences
- HBSC 7071 - Social and Behavioral Determinants of Health and Disease

Total: 9 Hours

III. Human Ecology and Environmental Adaptation

This course will emphasize the biological/physiological dimensions of human health and disease.

- HBSC 7031 - Human Ecology and Environmental Adaptation

Total: 3 Hours

IV. Research Design and Methods in the Health and Behavioral Sciences

Three HBSC core research design and methods courses, plus one additional advanced methods course of student's choosing. This series covers the philosophy of science and the structure of scientific inquiry, procedures for hypothesis-testing, quantitative and qualitative methodological strategies commonly employed in the field, epidemiology and program evaluation. Students must further develop specialized methodological skills by completing an independent study (HBSC 6840) or taking one additional course in advanced epidemiology, advanced biostatistics, health economics, survey research design or qualitative methods and data analysis. This requirement will be tailored specifically to the student's particular interests by his/her advisor.

- HBSC 7041 - Research Design and Methods in the Health and Behavioral Sciences I
- HBSC 7051 - Qualitative Research Design and Methods
- HBSC 7061 - Quantitative Methods in the Health and Behavioral Sciences
- HBSC 7161 - Quantitative Methods in Health&Behavioral Sciences II

Total: 12 Hours

V. Applications of the Health and Behavioral Sciences

This course offers students the opportunity to focus on individual research interests with guidance from faculty and input from peers.

- HBSC 7111 - Applications of the Health and Behavioral Sciences

Total: 3 Hours

TOTAL CORE: 29 Hours

Elective Courses

Elective course work together constitutes 3 semester hours, which can be drawn from the large number of offerings in the health and behavioral sciences at CU Denver. Students will be expected to fulfill the necessary prerequisites for taking these courses, and final authority as to whether a student may enroll in the course will rest with the department in which the course is offered.

TOTAL ELECTIVES: 3 Hours

Doctoral Dissertation Research

The doctoral dissertation research topic is chosen by the student. The student is expected to define a research question in health and behavioral science, identify the research strategy to be used for answering the question, conduct the research required and document the project in the form of a doctoral dissertation. The student will be guided in this process by a doctoral dissertation advisor and the additional members who comprise the student's doctoral dissertation committee (see below). A minimum of 30 semester hours of dissertation work is required. Students must register for a minimum of 5 dissertation credits each semester of their dissertation work. Students may not take more than a year's leave of absence or fail to enroll for semester hours more than three semesters before they are dropped from the program.

Advisors

Upon admission to the program, each student will be assigned a first-year advisor. The student or the faculty will then choose the faculty advisor who will guide the student through the core and elective course work. The faculty advisor may or may not be the chair of the student's dissertation committee. The student selects his or her chair and a minimum of three additional committee members who oversee the student's comprehensive examination and dissertation research.

Formal Review

A formal review of each student's progress will be undertaken at the end of each year of study. Students who are deemed not to be making satisfactory progress will be informed in writing as to the nature and final result of the review before the end of June.

The Dissertation Prospectus and the Comprehensive Examination

Before a student advances to candidacy, she/he must complete a dissertation prospectus and defend it successfully in the context of an oral comprehensive examination. The dissertation prospectus is a complete description of the question or hypothesis that the student wishes to research for the dissertation project, the research design and study techniques and an assessment of the proposed project's contribution to the field. It will include a comprehensive review of the relevant literature. If the student chooses to undertake research in a particular ethnic or cultural community, she/he must also demonstrate sufficient understanding of that setting including adequate knowledge of the language. This prospectus must be approved by the student's advisor prior to scheduling the comprehensive examination.

The comprehensive examination will be an oral format based in part on, but not restricted to, the material presented in the dissertation prospectus. This exam *must* take place before the student's advancement to candidacy and will typically occur by the end of the third year of study. A committee comprising the chair and a minimum of three faculty members will supervise the completion of the dissertation prospectus. This committee will conduct the oral examination and will recommend to the executive committee by a majority vote whether or not the student should be advanced to candidacy.

The Doctoral Dissertation and Final Exam

After advancement to candidacy, the student in consultation with his or her advisor will appoint a dissertation committee comprising the chair and a minimum of three faculty members. The chair and composition of the committee will be subject to approval by the program executive committee. The chair and two other members must have been present at the student's comprehensive examination and will be responsible for overseeing the research and writing of the doctoral dissertation. The committee will review drafts of the dissertation and, when the dissertation is completed to its satisfaction, will conduct the final exam, which will be based on the doctoral dissertation and related materials. The final examination will be open to the public.

Dissertation Total: 30 Hours minimum

Integrative and Systems Biology, PhD

► Graduate School Rules apply to this program.

Director for PhD Program: Michael Wunder

Office: Science, 4124

Telephone: 303-556-8870

E-mail: michael.wunder@ucdenver.edu

Website: clas.ucdenver.edu/biology/grad.html

Requirements for Admission

- A BA/BS or MS from an accredited institution awarded within the last 10 years (validation of current content may be required). Minimum undergraduate GPA: 3.0 ^[1]_[SEP]
- General GRE test: minimum 50% performance in each section (quantitative, verbal, and analytical writing)
- TOEFL: required for international applicants from countries in which English is not the official language ^[1]_[SEP]
- 3 letters of recommendation ^[1]_[SEP]
- Official transcripts from all attended institutions ^[1]_[SEP]
- Students are required to contact faculty in advance. Prior to application, applicants must have identified and contacted an available Faculty Advisor to ensure availability of a position and appropriate research interests ^[1]_[SEP]

Prerequisite courses required:

- One year of General Biology is preferred. Where needed, supplementary courses or reading programs may be designed to provide background information of sufficient depth for the Program curriculum ^[1]_[SEP]
- One course in applied or biological statistics (through regression and ANOVA) ^[1]_[SEP]
- Additional prerequisite requirements may be set by individual faculty ^[1]_[SEP]

Applications will be considered annually starting January 15 for both domestic US students and international students. Application to the PhD program is through CU Denver Admissions.

Degree Requirements

The PhD degree requirements comprise six phases. First, students must complete a minimum of 60 credits, including 30 dissertation credits. Up to 30 hours of graduate level courses from other programs may be transferred and counted toward the degree. Students must also pass the Preliminary Exam, form an Advisory Committee and an Examination Committee, meet the academic residency requirement, pass the comprehensive exam, and write and orally defend a dissertation.

Research-based PhD degree program requires

1. Completing 60 credits including 30 of dissertation (BIOL 8990)
2. Meeting minimum academic residency requirements
3. Passing the Preliminary Exam
4. Forming Advisory and Examination committees
5. Writing and defending research proposal
6. Passing the Comprehensive Exam
7. Writing and defending dissertation (including >1 publishable paper)

Required Courses

- BIOL 6764 - Biological Data Analysis (4 credits taken in the first year)
- BIOL 6002 - Biology Skills Sets - Pedagogy (2 credits taken in the first year)
- BIOL 7010 - Integrative and Systems Biology (3 credits taken in the first year))
- BIOL 6705 - Biological Research Workshop (4 credits total, taken two different times in the student's career)
- BIOL 6655 - Seminar (2 credits total, taken two different times in the student's career)

- BIOL 7050 - Special Topics (a minimum of 3 credits must be completed, but students may take up to 9 credits)
- BIOL 8990 - Doctoral Dissertation (30 credits must be completed after passing the Comprehensive Exam)

Leadership for Educational Equity EdD

► Graduate School Rules apply to this program

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Website: <http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/Doctorate/Pages/EdD.aspx>

Program Overview

Students completing this program earn a Doctorate of Education (EdD) in Leadership for Educational Equity. The EdD is a practice-based doctorate for professional leaders in P-20 or community-based educational contexts. The EdD prepares leaders within the profession to address complex educational challenges by combining decision-focused, analytic and research skills with a broad-based understanding of systems anchored in principles of equity and access to education. You will learn to translate research into practice, influence policy, use data effectively in decision-making, and organize individuals and groups to address challenges collaboratively and successfully.

This program reflects a cohort model. In addition to core courses, you select a concentration area (see the list below). Courses are offered in weekend, hybrid (part face-to-face, part online), online and/or summer intensive formats. Students follow their cohort in taking the prescribed coursework and experiences for three consecutive years. A five-year path is also available for students working full-time in the summer.

Course Work - 54 Semester Credits

- 6 credits - Equity core
- 6 credits - Leadership and Organizational Performance core
- 6 credits - Learning core
- 12 credits - Concentration area (select one)
- 9 credits - Research core
- 15 credits - Capstone (Dissertation in Practice)

Concentration Areas

Executive Leadership (with Licensure Option): is designed to deepen individuals' skills in policy analysis, development and research; personnel management; finance; accountability systems and evaluation; and community relations. Support individuals who hold or seek to move into senior management positions inside school districts, community colleges, higher education policy or community-based education organizations. Students working in P-12 schools may also choose either an administrator or a principal licensure option. Roles may include that of a director, deputy, superintendent or president.

Early Childhood Special Education/Early Childhood Education: is designed to introduce students to issues and practices in early childhood special education/early childhood education and to prepare students to provide leadership to improve outcomes for children with disabilities across early childhood settings. The program will prepare students who can act effectively as administrators in districts, agencies and programs to improve outcomes of all children, including children with disabilities.

Mathematics Education: students and faculty focus on teacher learning and professional development experiences. Specifically, projects investigate the ways that particular interventions used in professional development for mathematics teachers impacts their content knowledge and pedagogical practices in their classrooms. Work in this area is framed by a situated perspective of learning and incorporates mixed methods to answer questions around the ways particular interventions support teacher and student learning. Video data is prominent in both the design of professional development interventions as well as a major data source for analyses. Analytic methods vary based on the research question and grain size.

Professional Learning and Technology (PLT): this concentration area brings together faculty and students seeking to support working educators in ongoing professional development (PD) and learning activities, helping them become more effective and productive in their jobs. The PLT focus addresses the PD needs of K-12 teachers but also those of higher educators and workplace learners. Applying principles of adult learning, instructional design and change leadership, we use a variety of methods (mentoring, coaching, site-based communities, e-learning resources, workshops etc.) to support professional growth and accountability. The PLT courses in the EdD program prepare you to assume leadership in professional learning programs at all levels (site-based, district- or organization-wide), applying the latest research and best practices of the profession.

Science Education: prepares students to explore, understand, and think critically about the nature of science and science education from a largely research-oriented perspective. Students may elect to focus on environmental science education as an area of specialization within this concentration area through electives and discipline- specific research agendas.

Challenges to Opportunities to Achieve in Latino/a School Communities: this concentration will focus on leadership, organizational change and measurement, data-informed decision-making, and creating equity and excellence for all children. Students will look at school re-structuring for linguistic diversity, language education policy and politics, and issues of assessment and instruction for Latino/a students. Together with their faculty mentors, students will work with real data sets and authentic observations and apply their leadership skills to create real world solutions for change. **Funding available:** Students who are accepted into this cohort will receive scholarship funding for approximately half of the cost of the degree.

Urban Ecologies: this concentration area brings together several faculty members in interdisciplinary study of education in urban ecologies. Participating faculty members are aligned with the interdisciplinary concentration area as a whole, rather than specific threads or foci. The philosophical assumptions underlying work in this concentration area are: 1) Cultural groups are not monolithic, 2) Urban life and learning, including Pre-K-20 education, complex phenomena that benefit from the multiple lenses offered by multi-disciplinarily, and 3) Trans-nationalism characterizes the cultural experiences and political/economic realities of many communities in cities and contributes to the hybrid identities of residents. These assumptions contribute to a conceptual frame for investigating diversity within the city that is not focused on specific groups and is concerned with the influence of globalization on communities in general within the city. Experiences of and issues confronting different cultural and ethno-linguistic groups will be the key content of this concentration area.

Psychology, Clinical Health Psychology PhD

- Graduate School Rules apply to this program

Objectives of the Program

Clinical health psychology focuses the interaction between psychological, physiological, and environmental factors as they influence health and well-being. This emphasis includes focus on: 1) the development of effective disease prevention behavioral interventions for individuals and populations at high risk for medical problems; and 2) the development of strategies to help individuals who are already ill to manage their disease and to increase their ability to collaborate with medical professionals and improve their coping skills. A clinical health psychologist combines expertise in research on health psychology with training in clinical psychology. Students in this program are trained to work within the community to use clinical psychological skills and techniques to diagnose and treat mental health conditions, promote health and prevent illness, apply behavioral interventions in the treatment of illness, and improve the health care system. In addition to course work, students acquire expertise in research by completing both a master's thesis and doctoral dissertation. They demonstrate competence in clinical assessment and intervention through several applied practicum experiences, successful passage of the Comprehensive Clinical Competency Examination and successfully completing a pre-doctoral psychology internship. Students can complete the program in five years and have up to eight years to complete the program according to Graduate School Rules.

Admissions

The application deadline for receipt of all student information is December 1 for the following fall. You are responsible for making sure all materials are in on time. International students should be sure to submit all materials at least two weeks before this deadline (by November 15) so that they arrive at our department on time. Below is condensed information; see

<http://www.ucdenver.edu/academics/colleges/CLAS/Departments/psychology/Pages/Psychology.aspx> for complete information.

Admission Requirements:

- BA or BS from an accredited college or university, with a minimum GPA of 3.5 based on all college course work.
- Undergraduate courses in: introductory psychology, psychological statistics, research methods and abnormal psychology. Additional courses in psychology are highly desirable; our admissions committee will also look favorably upon courses in the biological and physical sciences.
- Two official transcripts from each college and university attended.
- Graduate Record Exam (GRE): The GRE General Test (verbal, quantitative, analytical writing) is required. Most students in the program had a combined verbal and quantitative score of at least 1100 on the old GRE scoring system. The GRE should be taken at least six weeks before the December 1 deadline so that the scores arrive on time.
- Three letters of recommendation, at least two of which must be academic references. Applicants provide contact information for their references in the online application. Those individuals are automatically contacted electronically and asked to upload their recommendations directly to your application file.
- The online Graduate Application, including your resume/vita and personal statement.
- Application fee of \$50 (\$75 for international students).

Financial Information

The University of Colorado Denver administers various forms of financial aid for graduate students: fellowships, scholarships and a number of awards from outside agencies. See the Office of Financial Aid for further information. Additionally, the psychology department offers teaching assistantships each year in such courses as introductory psychology, statistics, research methods and human development. Although we do not guarantee TA positions, we have been able to offer positions to our interested students.

Contingent upon the availability of grant money, faculty may also offer part-time research assistantships to qualified students. The typical RA position involves data collection and analysis, library research, etc. Some computer and statistical skills are usually required. RA positions are less available than TA positions, and they may arise on very short notice.

In-state tuition waivers and additional stipend monies may be available for doctoral students. We do guarantee to pay a full stipend, usually in the form of an assistantship, plus tuition for the first year. We will make every effort to do so for four years.

Note: Neither teaching nor research assistantships confer in-state tuition status.

Degree Requirements

Course Work:

The program requires approximately eight semesters of full-time course work and clinical practica, followed by a year-long internship. Students must maintain a 3.0 grade point average, and no grade below a *B* will count toward the requirements. Students must complete their doctoral dissertations prior to beginning their internship in the 5th year. Students can complete the program in five years and have up to eight years to complete the program, according to Graduate School Rules.

Master's Thesis:

The program has a provision for achieving a master's degree *en route* to obtaining the PhD. In addition to taking PSYC 8200, Teaching Skills Seminar, an master's degree is required for students to independently teach a course. During their time in the program, students' funding will likely require them to independently teach a course. Students must complete a master's thesis, an empirical research project that makes a significant contribution to the field. Although the thesis must address the student's own original question, the use of archival data and pilot studies is encouraged for this project.

Clinical Practica:

A minimum of 500 face-to-face intervention and assessment hours and 1200 total practicum hours [face-to-face intervention and assessment hours, plus supervision, plus support hours as defined by the Association of Psychology Postdoctoral and Internship Centers (APPIC)] are expected in preparation for application to pre-doctoral internships. Approximately 50% of required practica are typically conducted in medical settings. Sites for practica training, include the department's own Psychological Services Center and external facilities such as outpatient diabetes clinics, cancer clinics, OB/GYN, HIV/AIDS, end-stage renal disease, pain, and cardiovascular clinics, and in-patient psychiatric facilities. Students are able to select practica based on their personal and professional interests. All field placements are approved in advance by the Coordinator of Clinical Training.

Demonstration of Clinical Competency:

During the second semester of their third year in the program students must demonstrate their clinical

competency by completing the Comprehensive Clinical Competency Evaluation (CCCE). The CCCE is designed to facilitate student demonstration of clinical competence at the developmental level of readiness for application to clinical internship. This evaluation is designed to assess the developmentally appropriate broad and general clinical competencies in clinical psychology, and does not necessarily evaluate clinical health psychology competencies *per se*. The CCCE comprises three sequential components conducted in phases:

1. Applied clinical diagnosis, conceptualization and assessment/treatment plan for a standardized patient.
2. Intervention therapy session with a standardized patient.
3. Oral defense with faculty committee.

Dissertation:

Students must complete a dissertation that involves original empirical work and is distinct from other research projects and publications. The dissertation proposal must be completed and defended prior to making application for the pre-doctoral internship. Students must have a dissertation committee composed of four members of the graduate faculty. When the dissertation is completed to the satisfaction of the primary advisor, the student must orally defend the dissertation to the committee.

Internship:

Students must complete a 12-month, full-time pre-doctoral clinical internship, preferably at an APA-accredited site. This internship is required of all clinical psychologists and is the capstone of clinical training in the doctoral program.

Return to Department of Psychology

Courses

- PSYC 6950 - Master's Thesis
- PSYC 7144 - Advanced Cognition and Emotion
- PSYC 7205 - Advanced Developmental Psychology
- PSYC 7220 - Advanced Biological Bases of Behavior
- PSYC 7262 - Health Psychology I
- PSYC 7350 - Psychotherapy I
- PSYC 7360 - Psychotherapy II
- PSYC 7485 - Diversity in Clinical Psychology
- PSYC 7490 - Topics in Health Psychology Summer Lecture Series
- PSYC 7500 - Advanced Psychopathology
- PSYC 7511 - Historical and Philosophical Foundations of Psychology
- PSYC 7700 - Clinical Research Methods
- PSYC 7710 - Multivariate Statistics
- PSYC 7713 - Advanced Statistics
- PSYC 7730 - Ethics and Professional Issues in Psychology
- PSYC 7910 - Clinical Practicum
- PSYC 8100 - Clinical Behavioral Medicine
- PSYC 8200 - Teaching Skills Workshop
- PSYC 8262 - Health Psychology II
- PSYC 8501 - Primary Care Psychology
- PSYC 8502 - Cardiovascular Health Psychology

- PSYC 8503 - Group Interventions in Health Psychology
- PSYC 8550 - Advanced Social Psychology
- PSYC 8938 - Pre-Doctoral Internship
- PSYC 8990 - Doctoral Dissertation
- PSYC 7410 - Assessment I: Personality
- PSYC 7420 - Assessment I: Intellectual and Cognitive Assessment
- PSYC 8910 - Advanced Clinical Practicum

Public Administration PhD

Introduction

► Graduate School Rules apply to this program

Program Director: Tanya Heikkila, PhD

The School of Public Affairs offers a program of advanced graduate study leading to the doctor of philosophy in public affairs. The program, based on the Denver campus, permits elective work to be taken on any campus of the university if it is part of the approved program of study or degree plan.

The doctoral program was developed to meet the need for people with mastery in the scholarly theory, concepts and research skills of public administration, public policy and public management, and who are able to use such skills in careers of research, teaching and analysis of public-sector challenges. The PhD is designed to prepare students for leadership responsibilities in academia, research and public policy analysis. Accordingly, the PhD stresses the development of theoretical, conceptual and methodological knowledge in public administration, policy and management.

Faculty

Professors:

Lloyd Burton, PhD, University of California, Berkeley
 Mary Dodge, PhD, University of California, Irvine
 Angela Gover, PhD, University of Maryland
 Mary Guy, PhD, University of South Carolina
 Richard Stillman, PhD, Syracuse University
 Paul Teske, PhD, Princeton University

Associate Professors:

Allan Wallis, PhD, City University Graduate Center
 Christine Martell, PhD, Indiana University
 Tanya Heikkila, PhD, University of Arizona
 Lori Hughes, PhD, Washington State University
 Callie Rennison, PhD, University of Houston
 Danielle M. Varda, PhD, University of Colorado Denver
 Chris Weible, PhD, University of California-Davis

Assistant Professors:

Todd Ely, New York University
Lonnie Schaible, PhD, Washington State University
Benoy Jacob, PhD, University of Illinois at Chicago
John Ronquillo, PhD, University of Georgia

Research Professor:

Stephen Block, PhD, University of Colorado

Clinical Professor:

Malcolm Goggin, PhD, Stanford University

Students

The doctoral program is primarily designed to serve (1) people who desire to further the field of public policy and public and nonprofit management through teaching and research; (2) scholar-practitioners working in government, private-sector organizations concerned with government and nonprofit organizations; and (3) policy analysts in government, private-sector organizations concerned with government and nonprofit organizations.

Time Required for PhD Degree

The PhD program requires an intense commitment. Most courses and seminars are offered during the late afternoon, in the evenings or on an intensive basis. (Some electives are offered online, but core courses are not.) Anyone starting the PhD program with a master's degree in public administration can expect to take at least four to six years to complete all of the requirements for the PhD. Any student entering the program with no prior graduate work in public administration, public policy or management should expect additional course requirements.

PhD Admission Requirements

Admission to the program is based on the personal and professional qualifications of the applicant. It is desirable that an applicant have a master's degree in public administration or a closely related field before undertaking doctoral work. Applicants should have a 3.5 GPA or above in master-level course work, as well as GRE scores that are, at a minimum, above the 50th percentile ranking in both the quantitative and verbal sections. Successful applicants will also show the potential for productive careers in scholarship, research and analysis.

Meeting the minimum thresholds listed above does not assure admission. In unusual cases, students who fail to meet the thresholds may be admitted if high academic skills are demonstrated in other ways.

PhD Application Process

Applicants must submit the following items to the SPA office before they can be formally considered for admission. The application deadline is February 1; admitted students will begin in the fall semester.

- application forms

- official transcripts (two copies) from all degree granting institutions
- GRE scores (no more than five years old)
- a resume or vita
- three letters of reference attesting to a candidate's academic promise
- a well-articulated statement of purpose demonstrating an understanding of the research orientation of the degree and a strong motivation and determination to successfully complete the program

In addition, students may also submit samples of research reports or publications.

Applicants whose native language is not English are required to submit TOEFL or IELTS scores. This requirement may be waived for applicants who have completed a baccalaureate or graduate-level degree program at an English-speaking college or university. In addition, applicants whose native language is not English are required to participate in an oral interview to demonstrate English language skills sufficient to succeed in a rigorous American doctoral program.

All application materials will be retained by SPA and will not be returned. A personal meeting with the PhD director or other faculty member is recommended.

Financial Assistance

For excellent candidates, SPA will fund a small number of doctoral research assistantships each year based on financial availability. Students selected will receive a full-tuition waiver as well as a stipend for the academic year. SPA's goal is to provide such funding for students for at least three years.

Degree Requirements

Course Work

A total of 36 semester hours of course work is required past a master's degree in public administration or a related degree. In some cases, additional prerequisite courses may be required to assure adequate preparation for doctoral studies. All PhD students are required to take a minimum of 6 semester hours of course work in both the fall and spring semesters, until their course work requirements are met, if they wish to maintain their full-time student status.

During their first year of study, all PhD students are required to take the following four doctoral seminars:

- PUAD 8010 - Historical and Comparative Foundations of Public Administration
- PUAD 8020 - Seminar in Public Management
- PUAD 8030 - Seminar in Public Policy
- PUAD 8040 - Seminar In Economic and Institutional Foundations of Public Affairs

Total: 12 Hours

During the next year, doctoral students are required to take the following methods classes:

- PUAD 8060 - Seminar On The Conduct Of Empirical Inquiry
- PUAD 8070 - Quantitative Methods II

Total: 9 Hours**Additional Coursework:**

In addition to the three methods classes listed above (8050, 8060, and 8070), students must take an approved qualitative methods course of the student's own choosing. Depending on the student's interest, topics might include qualitative methodology, administrative law, geographical information systems, or social network analysis. In addition, all PhD students must complete four elective courses relevant to the student's dissertation plans. With approval of the PhD director, students may apply up to 9 semester hours of graded graduate-level credit taken at other universities toward their elective courses.

Preliminary Exam, Dissertation Proposal, and Dissertation

In addition to course work, PhD students must pass a preliminary exam in the testing cycle or semester immediately following the completion of their core courses. Students are also required to complete and defend, before a faculty committee, a dissertation that makes a significant contribution to the literature and theory of public administration, management or policy. Prior to starting the dissertation, students must successfully pass a comprehensive exam that demonstrates their preparation for conducting dissertation research. At the proposal defense, a doctoral student presents a dissertation proposal to SPA faculty and students, and to his or her dissertation committee.

Students are advanced to candidacy for the PhD once they have completed all required course work and examinations, have successfully presented their research and have been certified for candidacy by his/her doctoral committee. After students are formally advanced to candidacy, they must complete a total of 30 hours of dissertation research credit to complete the PhD. Each fall and spring semester, students are expected to register for 5 semester hours of dissertation research; if unable to register for at least 5 semester hours, students must request a leave of absence from the PhD program until able to complete the minimum dissertation requirement. Students may take up to two semesters' leave of absence before they are unenrolled from the program. Students then would need to reapply to the program.

Further details on the program can be found in the *Handbook for the Doctor of Philosophy in Public Affairs Program*, available from the SPA office or online at <http://spa.ucdenver.edu>.

Licensure**Administrator License - Executive Leadership Program****Administrative Leadership and Policy Studies****Requirements for Principal Licensure, the MA and EdS degrees, Executive Leadership Administrator License, and EdD and PhD with Administrative Leadership & Policy Studies concentrations**

Office: Lawrence Street Center, 701

Telephone: 303-315-6300

Fax: 303-315-6311

E-mail: education@ucdenver.edu

Web site:

<http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/Pages/Administrative-Leadership-and-Policy-Studies.aspx>

Click on any of the following to go right to that information:

- Principal Licensure
- Master of Arts Degree
- Education Specialist Degree
- Executive Leadership Administrator Licensure Program
- EdD Leadership for Educational Equity with Principal or Administrator License
- PhD Education & Human Development with concentration in Administrative Leadership & Policy Studies

Faculty

For information about faculty in this area, visit <http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/FacultyandResearch/Pages/Our-Faculty.aspx>.

The primary responsibility of the administrative leadership and policy studies (ALPS) faculty is to prepare leaders for public education in Colorado and the nation. Currently, the principal license is required for people seeking building-level administrative positions in Colorado. Alternatively, the administrator license may be required for district-level leadership positions in Colorado.

Principal Licensure Program

ALPS offers coursework that leads to eligibility to apply for the initial license for principal through the Colorado Department of Education. A passing score on the Principal PLACE content exam is also required for principal licensure through the Colorado Department of Education. Having earned an initial license, those who go on to complete a district sponsored induction program may then apply for a professional license by the Colorado Department of Education.

ALPS's 32 semester-hour principal licensure program is project-based, requiring students to present evidence of meeting both state and national standards through performance based assessments. A 400-hour clinical-practice experience is integrated throughout the four-semester program.

Students submit performance-based assessments (PBAs) during the principal licensure program to LiveText, an online assessment system. PBAs not approved by the end of the fourth semester must be completed within the two subsequent semesters (not including summer.)

Note: Those already holding a master's degree and 5 years of leadership in education should also see the Executive Leadership Program for pursuing administrator (superintendent) licensure.

Principal Licensure Cohort Options

Typically, cohorts are comprised of 25 principal candidates who move through the four-semester principal licensure program together. We look for applicants to have a teaching or special services license plus a minimum of three years post-licensure experience. We welcome applicants from all districts into our principal licensure cohorts. However, we partner with metro-area districts to prepare leaders specifically for their schools.

Distance Learning Cohort

The Distance Learning cohort option has a long history of serving students who live far away from campus. Additionally, this cohort offers students a hybrid (online and face-to-face) course format. Students meet in the first summer for a three-day boot camp. In the fall, they experience two Friday/Saturday weekend sessions. And, they attend two more weekend sessions the following spring. During the second summer, they attend a culminating half-day session. The rest of the work is completed online.

Denver Public Schools

The DPS cohort option is one of the DPS Pathways to Principalship. The work in this cohort is focused on leadership for ELL (English Language Learner) student populations as well as cultural leadership. Instructors and students work closely with not only state and national standards, but also with the LEAD Framework to prepare principals. Students meet on one Saturday and two Tuesdays a month over four semesters. A new cohort starts each spring. Please review this information on the DPS website.

Jefferson County Public Schools

The JeffCo cohort option is offered in partnership with Jefferson County Public Schools. Courses occur on twelve Tuesday evenings during each of the four semesters. This standards-based, performance-based assessed, cohort program is taught by university professors and experienced JeffCo administrators.

Northern Cohort

The Northern Cohort option is offered in partnership with the Boulder Valley School District for applicants from northern-metro districts. This cohort meets on Wednesday evenings during each of the four semesters of the program. This standards-based, performance-based assessed, cohort program is taught by university professors and experienced district administrators.

CU South Denver Cohort

The CU South Denver cohort serves southern-metro districts (Douglas County, Cherry Creek, Littleton, Sheridan, Englewood, Lewis-Palmer and Colorado Springs School District 11). This cohort meets on twelve Tuesdays during each of four semesters at the Liniger Building at CU South Denver. This standards-based, performance-based assessed, cohort program is taught by university professors and experienced district administrators.

Cohorts start at one or more locations each semester and involve a combination of regular in-person meetings (up to 15 times per semester) and online work.

EDUC 5751 - Principal/Administrator Licensing I. Semester Hours: 3 to 9

EDUC 5752 - Principal Administrator Licensing II. Semester Hours: 3 to 9
EDUC 5753 - Principal/Administrator Licensing III. Semester Hours: 3 to 9
EDUC 5754 - Principal or Administrator Licensing IV. Semester Hours: 3 to 9

Total: 32 Hours

MA Program

The MA is designed for those who do not already hold a graduate degree. Master's students will complete 9 semester hours beyond the 32 required in the licensure program, for a total of 41 semester hours of coursework. Candidates must also successfully complete a comprehensive exam paper, reflecting on how the three MA classes will help them in the role of principal.

For the MA degree, students must select at least one course in each of the following three areas plus complete the 32 semester hour principal license:

Section A: Educational Research

RSEM 5100 - Basic Statistics Semester Hours: 3
RSEM 5120 - Introduction to Research Methods Semester Hours: 3
RSEM 5110 - Introduction to Measurement Semester Hours: 3

Section B: Educational Foundations/Multicultural Education

EDFN 5050 - Critical Issues in American Education Semester Hours: 3
CLDE 5140 - Multicultural Education Semester Hours: 3
CLDE 5160 - Historical, Legal And Cultural Foundations For The Education Of Immigrant And Language Minority Stdn Semester Hours: 3

Section C: Education & Human Development/Special Education

EDHD 6100 - Advanced Child Growth and Development Semester Hours: 3
EDHD 5110 - Human Learning Semester Hours: 3
EDHD 6140 - Social Contexts of Adolescence and Schooling Semester Hours: 3
EDHD 5200 - Social Psychology of Learning Semester Hours: 3
SPED 5140 - Advanced Assessment in Special Education. Semester Hours: 3
SPED 5401 - Action Research and Leadership in Special Education Semester Hours: 3
SPED 5600 - Special Education for School Professionals. Semester Hours: 3

Candidates must also successfully complete a comprehensive exam paper, reflecting on how the three MA classes will help them in the role of principal.

EdS Program

The EdS degree program affords the opportunity for advanced graduate study and is available to those who already hold a master's degree. Generally, for the specialist degree students will complete 9 semester hours that constitute an area of focus, in addition to the 32 required in the principal licensure program. Candidates

must also successfully complete a comprehensive exam paper, reflecting on how the three EdS classes will help them in the role of principal.

Administrator Licensure - Executive Leadership Program

Designed for the professional educator who, already holding a master's degree and 5 years leadership experience in education, wishes to apply for an initial administrator license through the Colorado Department of Education and prepare for a career as a superintendent or other district leader. In addition to coursework, a passing score on the Administrator PLACE content exam is also required for administrator licensure through the Colorado Department of Education. The 12-semester-hour administrator licensure program combines weekend meetings with online work and hands-on clinical practice-usually completed in participants' home districts:

EDUC 7500 - Strategic Human Capital Development

EDUC 7510 - Strategic Organizational Management

EDUC 7520 - Strategic System Improvement

EDUC 7530 - Strategic Leadership Development

These courses are differentiated for four student types: certificate students, administrator licensure students, EdS students, EdD students and PhD students. Learn more at www.ucdenver.edu/education/elp.

EdD Leadership for Educational Equity with Principal or Administrator License

Students interested in pursuing the principal or administrator license along with a doctorate should instead apply to the EdD Leadership for Educational Equity instead of to the MA or EdS Administrative Leadership & Policy Studies with Principal License or the Executive Leadership Administrator License. See the Ed Leadership for Educational Equity with Executive Leadership Principal or Administrator License for more information.

PhD Education and Human Development with concentration in Administrative Leadership and Policy

The Administrative Leadership & Policy Studies PhD concentration serves as a key area for those concerned about leadership in schools and a key focus for research by scholars in higher education. A crucial assumption the underlies this concentration area is that school leadership makes the difference in how schools succeed in improving learning outcomes for all students, but we are only beginning to scratch the surface in understanding why leadership is successful when it is, what the interactions are between effective leadership and effective teaching, and their collective impact on learning outcomes at all levels in schools. See the PhD Education and Human Development for more information.

Early Childhood Special Education Specialist Licensure

Office:

Lawrence Street Center, 701

Telephone:

303-315-6300

Fax:

303-315-6311

E-mail:

education@cudenver.edu

Web site:

www.ucdenver.edu/education

Faculty:

More information about faculty in this division is available online at www.ucdenver.edu/education

About the early childhood education program

The early childhood education (ECE) program leads to a master's degree in early childhood education and/or Colorado teacher license in early childhood special education (ECSE) specialist. The program prepares leaders who will enrich the life experience of young children (birth to 8 years) and their families through a variety of professional roles.

The ECE program is interdisciplinary in focus, drawing on university resources and the clinical expertise of various community professionals. There is a strong emphasis on fieldwork and practicum experiences in both regular and special education concentrations. Field experiences are a part of each course and provide an opportunity for each student to gain knowledge, abilities and dispositions while interacting with children, families, program staff and community agencies. Practicum experiences are designed to allow students to apply knowledge and practice skills in a closely supervised environment.

Curriculum and Program Requirements

Semester Hour Requirements

Master's degree in ECE: 30 semester hours

ECSE specialist license: 33 semester hours

Master's degree plus ECSE specialist license: 39 semester hours

Master's degree plus ECSE specialist added endorsement: 33 semester hours

ECSE specialist added endorsement: 24 semester hours

Early childhood education and the early childhood special education focus share course content in:

- language development and disorders
- child growth and development, differences and disorders
- learning approaches with young children
- measurement and evaluation
- basic statistics/research methods
- multicultural education
- research and current issues

- early childhood curriculum and program development for inclusive classrooms
- working collaboratively with parents and families
- program administration/leadership

The early childhood education program provides specialized training in:

- language acquisition and development
- literacy instruction
- infant/toddler development
- early childhood mental health and social competence

The early childhood special education program provides specialized training in:

- screening and assessment of young children
- intervention strategies with infants and preschoolers
- behavior management
- working as a member of the transdisciplinary team
- cognitive and socio-emotional development and disorders
- treatment of children who have neurological impairment and chronic illness
- challenging behaviors and autism

For more information on coursework and plans of study, please contact an advisor in the School of Education and Human Development.

Fieldwork and Practicum Requirements

The master's degree in early childhood education includes a total of 425 hours of required fieldwork/practica. Approximately 200 hours of fieldwork are associated with course assignments; 225 hours of intense, culminating practica occur toward the end of the second year of study. Students completing the MA program take a written comprehensive exam (take home) during the final semester of their program (concurrently with courses at the end of the program sequence).

For the master's degree in early childhood education plus the ECSE specialist initial license, a total of 800 hours of fieldwork/practica is required. Approximately 290 hours of fieldwork are associated with course assignments; 510 hours of intense, culminating practica occur toward the end of the second year of study. Students seeking an added endorsement in ECSE specialist also complete 510 hours of practicum experiences.

Principal Licensure

Administrative Leadership and Policy Studies

Requirements for Principal Licensure, the MA and EdS degrees, Executive Leadership Administrator License, and EdD and PhD with Administrative Leadership & Policy Studies concentrations

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EDUC 7500 - Strategic Human Capital Development

EDUC 7510 - Strategic Organizational Management

EDUC 7520 - Strategic System Improvement

EDUC 7530 - Strategic Leadership Development

These courses are differentiated for four student types: certificate students, administrator licensure students, EdS students, EdD students and PhD students. Learn more at www.ucdenver.edu/education/elp.

EdD Leadership for Educational Equity with Principal or Administrator License

Students interested in pursuing the principal or administrator license along with a doctorate should instead apply to the EdD Leadership for Educational Equity instead of to the MA or EdS Administrative Leadership & Policy Studies with Principal License or the Executive Leadership Administrator License. See the Ed Leadership for Educational Equity with Executive Leadership Principal or Administrator License for more information.

PhD Education and Human Development with concentration in Administrative Leadership and Policy

The Administrative Leadership & Policy Studies PhD concentration serves as a key area for those concerned about leadership in schools and a key focus for research by scholars in higher education. A crucial assumption the underlies this concentration area is that school leadership makes the difference in how schools succeed in improving learning outcomes for all students, but we are only beginning to scratch the surface in understanding why leadership is successful when it is, what the interactions are between effective leadership and effective teaching, and their collective impact on learning outcomes at all levels in schools. See the PhD Education and Human Development for more information.

Endorsement Programs

Early Childhood Special Education Specialist Endorsement

Office:

Lawrence Street Center, 701

Telephone:

303-315-6300

Fax:

303-315-6311

E-mail:

education@cudenver.edu

Web site:

www.ucdenver.edu/education

Faculty:

More information about faculty in this division is available online at www.ucdenver.edu/education

About the early childhood education program

The early childhood education (ECE) program leads to a master's degree in early childhood education and/or Colorado teacher license in early childhood special education (ECSE) specialist. The program prepares leaders who will enrich the life experience of young children (birth to 8 years) and their families through a variety of professional roles.

The ECE program is interdisciplinary in focus, drawing on university resources and the clinical expertise of various community professionals. There is a strong emphasis on fieldwork and practicum experiences in both regular and special education concentrations. Field experiences are a part of each course and provide an opportunity for each student to gain knowledge, abilities and dispositions while interacting with children, families, program staff and community agencies. Practicum experiences are designed to allow students to apply knowledge and practice skills in a closely supervised environment.

Curriculum and Program Requirements

Semester Hour Requirements

Master's degree in ECE: 30 semester hours

ECSE specialist license: 33 semester hours

Master's degree plus ECSE specialist license: 39 semester hours

Master's degree plus ECSE specialist added endorsement: 33 semester hours

ECSE specialist added endorsement: 24 semester hours

Early childhood education and the early childhood special education focus share course content in:

- language development and disorders
- child growth and development, differences and disorders
- learning approaches with young children
- measurement and evaluation
- basic statistics/research methods

- multicultural education
- research and current issues
- early childhood curriculum and program development for inclusive classrooms
- working collaboratively with parents and families
- program administration/leadership

The early childhood education program provides specialized training in:

- language acquisition and development
- literacy instruction
- infant/toddler development
- early childhood mental health and social competence

The early childhood special education program provides specialized training in:

- screening and assessment of young children
- intervention strategies with infants and preschoolers
- behavior management
- working as a member of the transdisciplinary team
- cognitive and socio-emotional development and disorders
- treatment of children who have neurological impairment and chronic illness
- challenging behaviors and autism

For more information on coursework and plans of study, please contact an advisor in the School of Education and Human Development.

Fieldwork and Practicum Requirements

The master's degree in early childhood education includes a total of 425 hours of required fieldwork/practica. Approximately 200 hours of fieldwork are associated with course assignments; 225 hours of intense, culminating practica occur toward the end of the second year of study. Students completing the MA program take a written comprehensive exam (take home) during the final semester of their program (concurrently with courses at the end of the program sequence).

For the master's degree in early childhood education plus the ECSE specialist initial license, a total of 800 hours of fieldwork/practica is required. Approximately 290 hours of fieldwork are associated with course assignments; 510 hours of intense, culminating practica occur toward the end of the second year of study. Students seeking an added endorsement in ECSE specialist also complete 510 hours of practicum experiences.

Instructional Technology Endorsement

Licensed K-12 teachers may elect to complete a 24-semester-hour program leading to state endorsement in instructional technology at the teacher or specialist level. Upon program completion, teachers with a minimum of 3 years of licensed teaching experience can apply for the specialist-level endorsement. The teacher-level endorsement requires a teaching license, but does not require licensed teaching experience. In addition to coursework, a passing score on the Instructional Technology PLACE content exam is also required to apply for the endorsement through the Colorado Department of Education. Students should consult the ILT Current Student Resources website for complete program requirements.

For complete details about ILT programs, endorsement requirements and certificates, see the ILT website.

School Library Endorsement

Office: 999 18th St.

Telephone: 720-639-9228

Fax: 303-315-6311

E-mail: cpe@ucdenver.edu

Website:

<http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/MASTERS/SchoolLibrary/Pages/SchoolLibrary.aspx>

Faculty

Information about SLIL faculty is available online at

<http://www.ucdenver.edu/academics/colleges/SchoolOfEducation/Academics/MASTERS/SchoolLibrary/Pages/SchoolLibrary.aspx>

Program Overview

The school library and instructional leadership program within the ILT master's degree program is a nationally recognized NCATE-AASL revised and approved school library media education program that leads to the Colorado Department of Education endorsement for school libraries. The program integrates information literacy standards through the use of collaborative planning, as approved by the American Association of School Libraries. Technology and library resources are seen as tools to increase student achievement by integrating 21st Century Learning standards with the content standards of the classroom teacher. The program adheres to the constructivist theory of resource-based learning, teacher leadership, instructional coaching, and media literacy. The program believes that school librarians require education as a teacher as well as a librarian, as advocated by the American Library Association and the International Association of School Libraries. As a school librarian, you will provide collaborative instruction, information access and leadership through the management of your library program and the library resources. Courses are offered in a completely online program.

Once admitted, students begin a plan of study that typically takes about two years to complete. Consult the SLIL website for more information about specific plans of study, course offerings and expectations of cohort groups.

Admission Requirements

Admission decisions are based on undergraduate and graduate grades, external letters of recommendation and fit with the program as reflected in a letter of intent. In some cases, results of a test (GRE) are also required. Prospective students should consult the SLIL program website for complete admission procedures and requirements.

Professional Expectations

All students in the SLIL program are expected to show a strong commitment to the program and to maintain high academic, professional and ethical standards. Inappropriate or unprofessional conduct is cause for discipline or dismissal from the program.

Technology Expectations

The SLIL program uses computers and related technologies either as a focus or a tool for learning. Students are expected to obtain an e-mail account and check it frequently. In addition to on-campus facilities, SLIL students need convenient access to Internet-connected computers off campus, either at their place of work or at home. In addition to textbooks, software purchases may be required or recommended for specific classes.

Program Requirements

School library students also have a choice between a school librarian endorsement-only and a full master's program with a teacher-librarian endorsement. The endorsement requires a minimum of 24 graduate semester hours. Students complete a plan of study consisting of courses and professional field experience. To receive Colorado teacher endorsement, students are required to pass the PLACE test in school library. This is a Colorado Department of Education requirement.

Consult with your program and faculty advisor for a current example of a program plan of study.

Courses are offered only in certain semesters and courses should be taken in a particular sequence based on when you start the program. Advising is required prior to enrolling in a course, even as a non-degree student, in order to ensure the most effective course sequencing and availability of courses.

24 Credit Endorsement Degree Plan of Study

Prefix: Course Title	Term	Credits
SCHL 5100: School Libraries in the Digital Age	Fall	4
SCHL 5030: Information Literacy & Reference	Fall	3
SCHL 5160: Managing School Library Programs	Spring	3
SCHL 5040: Information Storage & Utilization	Summer	2
SCHL 5200: Promoting Literacy through SL	Summer	3
SCHL 5913: School Library Field Experience	Fall	3
INTE 5300: Media Literacy & Maker Spaces	Summer	3
INTE 6999: Leadership & Practice	Fall	3
PLACE Test Passed (if seeking an endorsement in CO post-graduation)		0

Graduate Certificate Programs

Applied Statistics Graduate Certificate

► Graduate School Rules apply to this program.

Coordinator: Stephanie Santorico:

Telephone: 303-315-1714

E-mail: Stephanie.Santorico@ucdenver.edu

Web site: www.math.ucdenver.edu

There is a growing need for qualified statistical analysts of the ever-increasing amounts of data collected in business, industry, and government. The Certificates in Applied Statistics program is designed to give students a strong background in statistical methodology and data analysis in preparation for opportunities in the work force or for graduate studies.

Students will gain competence in such topics as descriptive statistics, estimation, confidence intervals, probability and inferential techniques, simple and multiple regression, analysis of variance, and more-advanced topics. Students can focus on a particular application area such as economics, psychology, sociology, geology or environmental science through the choice of an elective course and the data analysis project.

Admissions Requirements

Applicants must hold a baccalaureate degree (not necessarily in mathematics) from an accredited college or university (or demonstrate completion of work equivalent to the baccalaureate degree given at CU Denver) with at least a 3.0 grade point average (GPA). Students must also have 24 semester hours of mathematics, at least 18 of which are upper division courses with a grade of B- or better. These courses must include calculus 1, 2 and 3 as well as linear algebra and probability at the undergraduate level. Exceptions to admission criteria may be made on a case by case basis.

Certificate Requirements

Four courses and a 1 hour independent study are required as detailed below.

Two Fundamental Courses in Statistics

- MATH 5320 - Introduction to Mathematical Statistics
Offered: SPRING
- MATH 5387 - Applied Regression Analysis
Offered: FALL

One Advanced Applications Course

Topics vary from year to year. Course must be pre-approved by certificate coordinator and cannot be MATH 5830. Representative courses include:

- MATH 5394 - Experimental Designs

- MATH 6388 - Advanced Statistical Methods for Research
- MATH 6393 - Introduction to Bayesian Statistics

One Elective

- Any statistics course in the Department of Mathematical and Statistical Sciences at the 5000 level or higher (must be pre-approved by the Certificate Coordinator). MATH5830 cannot apply towards the certificate.
- ECON 5150 - Economic Forecasting
- ECON 5813 - Econometrics I
- ECON 5823 - Econometrics II
- ENV5 5600 - Applied Statistics for the Natural Sciences
- GEOL 5770 - Applied Statistics for the Natural Sciences
- SOCY 5183 - Seminar: Quantitative Data Analysis
- Equivalent course pre-approved by the Certificate Coordinator

Project Requirement

An independent data analysis project with a report and presentation to demonstrate proficiency with data analysis techniques and a statistical computing software package. Enroll for one hour of MATH 5840, Independent Study, or in an equivalent course pre-approved by the Certificate Coordinator.

Additional Requirements

Students must maintain a 3.0 GPA or above in these courses with no credit given for courses with grades below B-. Since a certificate is a University of Colorado Denver certification of a student's specialized knowledge in an advanced subject area, all courses in the certificate program must be taken in residency at University of Colorado Denver. Students must be enrolled in one course per year to maintain their status in the certificate program. Certificates must be completed within 3 years from matriculation.

Biochemistry Certificate

Students should meet with the chemistry major advisor to file a certificate plan prior to the semester of graduation. The certificate is available to degree seeking undergraduates, non-degree seeking graduate students and students pursuing a chemistry minor.

These degree requirements are subject to periodic revision by the academic department, and the College of Liberal Arts and Sciences reserves the right to make exceptions and substitutions as judged necessary in individual cases. Therefore, the College strongly urges students to consult regularly with the Chemistry advisor to confirm the best plans of study before finalizing them.

A grade of C or better in each of the Prerequisites is required, although these courses do not have to be completed at CU Denver. The Required Courses including electives must be completed at CU Denver with a grade of B or better in each class, and a minimum GPA of 3.0 among the Required Courses including electives counted toward the Certificate. Students must adhere to the Graduate School Rules for this program.

Certificate Requirements

Prerequisites

Prerequisites for the Certificate (these courses do not have to be completed at CU Denver but must have been completed within ten years of receipt of the Biochemistry Certificate):

- 2 semesters General Chemistry, with laboratories
- 2 semesters General Biology, with laboratories
- 2 semesters Organic Chemistry, with at least 1 semester laboratory

A grade of C(2.0, not C-) or better in each of the Prerequisites is required.

- CHEM 2031 - General Chemistry I
- CHEM 2061 - General Chemistry II
- CHEM 2038 - General Chemistry Laboratory I
- CHEM 2068 - General Chemistry Laboratory II
- BIOL 2051 - General Biology I
- BIOL 2061 - General Biology II
- BIOL 2071 - General Biology Laboratory I
- CHEM 3411 - Organic Chemistry I
- BIOL 2081 - General Biology Laboratory II
- CHEM 3421 - Organic Chemistry II
- CHEM 3418 - Organic Chemistry Laboratory I
- **OR**
- CHEM 3428 - Organic Chemistry Laboratory II

Required Courses

The required courses including electives must be completed at CU Denver with a grade of B or better in each class, and a minimum GPA of 3.0 among the Required Courses including electives counted toward the certificate. All courses must be taken within ten years of receipt of the Biochemistry Certificate.

Take **one** of the following Biochemistry courses:

- CHEM 4810 - General Biochemistry I
- **OR**
- CHEM 5810 - Graduate Biochemistry I

Take **one** of the following Biochemistry courses:

- CHEM 4820 - General Biochemistry II
- **OR**
- CHEM 5830 - Graduate Biochemistry II

Take:

- BIOL 3611 - General Cell Biology

Electives

Take **two** of the following elective courses in consultation with your certificate advisor:

- BIOL 3124 - Introduction to Molecular Biology
- OR**
- BIOL 4128 - Topics in Molecular Biology
- BIOL 3225 - Human Physiology
- BIOL 3832 - General Genetics
- BIOL 4064 - Advanced Cell Biology
- OR**
- BIOL 5064 - Advanced Cell Biology
- BIOL 4068 - The Cell Cycle
- OR**
- BIOL 5068 - The Cell Cycle
- BIOL 4125 - Molecular Biology Laboratory
- OR**
- BIOL 5125 - Molecular Biology Lab
- BIOL 4126 - Molecular Genetics
- OR**
- BIOL 5126 - Molecular Genetics
- BIOL 4144 - Medical Microbiology
- OR**
- BIOL 5144 - Medical Microbiology
- BIOL 4550 - Cell Signaling
- OR**
- BIOL 5550 - Cell Signaling
- CHEM 3011 - Inorganic Chemistry
- CHEM 3111 - Analytical Chemistry
- CHEM 4121 - Instrumental Analysis
- CHEM 4511 - Physical Chemistry: Thermodynamics and Kinetics
- CHEM 4521 - Physical Chemistry: Quantum and Spectroscopy
- CHEM 4828 - Biochemistry Lab
- PHYS 3151 - Biophysics Outlook I
- AND**
- PHYS 3161 - Biophysics Outlook II (these two 1-credit courses together fulfill one elective requirement)
- PHYS 3451 - Biophysics of the Cell
- PHYS 3452 - Biophysics of the Cell NM

Bioinnovation and Entrepreneurship Certificate

The Business Schools graduate certificates are primarily intended to give individuals with an undergraduate degree in any discipline access to business courses that can help them succeed in their current job or even help them launch their own company.

Students can pursue one of our graduate certificates, even if they are not CU Denver students, without taking the GMAT. Credit earned as a part of the certificate DOES count towards your graduate business degree, should you choose to pursue a degree here. One such certificate is our Bioinnovation and Entrepreneurship Certificate.

Bioinnovation and Entrepreneurship Certificate

The Certificate in Bioinnovation and Entrepreneurship is one-of-a-kind, and is geared to helping bioentrepreneurs achieve commercial success. Students have opportunities to participate in a number of Jake Jobs Center programs; including the annual business plan competition, internships in area businesses, speaker programs with local entrepreneurs, and connection with new ventures. Visit the Jake Jobs Center for Entrepreneurship to learn more about our entrepreneurship programs.

Bioinnovation Certificate Information

Commodities Certificate

The Business Schools undergraduate certificates are primarily intended for students currently pursuing a degree in any undergraduate discipline that want to expand their business knowledge to give themselves a leg up when they enter the work force. However, they can also be taken by students with only a high school diploma.

In addition, the Business Schools also offers graduate certificates which are primarily intended to give individuals with an undergraduate degree in any discipline access to business courses that can help them succeed in their current job or even help them launch their own company.

Students can pursue one of our undergraduate or graduate certificates in Commodities, even if they are not CU Denver students. Credit earned as a part of the certificate DOES count towards your undergraduate degree, should you choose to pursue a degree here. One such certificate is listed below:

Commodities Certificate

The Business School awards a Certificate (of completion) in Commodities to students completing three finance and commodities courses. Students completing the certificate will have an improved understanding of the complex commodities market. Topics covered include regulation, trading, financial fundamentals, investing, risk management and ethics. Please contact the Commodities Center for more information.

Democracy and Social Movements Graduate Certificate

► Graduate School Rules apply to this program.

Program Advisor: Lucy McGuffey

Office: Student Commons Building, Room 3217

Telephone: 303-315-1761

E-mail: lucy.mcguffey@ucdenver.edu

The Democracy and Social Movements (DSM) certificate program in political science introduces students to current research and practice concerning the complex interplay between social movements and the processes for initiating and consolidating democracies. While contentious political activities have historically contributed to democratization, they have also led to repression, ethnic conflict and substantive human rights violations. Among the several DSM issues requiring scholarly investigation are:

- Viable ways to contest authoritarian regimes;
- The means for constituting a cohesive civil society after a civil war or revolution;

- The relationships between social equality, distributive justice and democracy;
- The relative efficacy of violence and of nonviolent strategies to institute and sustain regime change;
- The challenges of peace building, transitional justice and democratization in societies torn by internal conflict;
- The growth of transnational social movements in response to globalization;
- The contextual factors determining the specific character of any social movement and of democratic regimes;
- The means by which democratic regimes are consolidated and deepened; and
- The ways in which democratization processes and social movements influence law and public policy, public discourse and culture, the use and design of public/private spaces and the socio-economic outcomes.

Students in the DSM program examine relevant theoretical and methodological literature in these aforementioned areas and apply it to current circumstances by taking specified courses in each of the four major subfields of political science: American, comparative, international politics and political theory.

The DSM certificate program is designed to appeal to persons who want to focus their studies on the recent state of democratization processes around the world, including explorations of the ways in which social movements can catalyze or even threaten those democratization processes. Students in the program will explore how globalization is simultaneously fragmenting and uniting the globe, enhancing wealth and impoverishing people, consolidating human rights regimes and transgressing them and provoking questions about the boundaries of our ethical commitments and the means whereby communities strive for democracy and justice.

By permitting students to devise a curriculum that integrates academic and experiential, the DSM program should enhance students' scholarship, civil engagement and prospects for further study and employment in rapidly growing fields like international/community development, the non-governmental organization sector, civic education/engagement and human rights.

Requirements

The graduate certificate requires three program courses and the capstone seminar [12 total credits; all must be graduate-level (5000 or above) courses]. Field work/experiential learning is encouraged and promoted throughout the graduate program, but it is not a certificate requirement.

All courses for the certificate must be taken in residency at CU Denver, and completed with a grade of *B* or higher. A minimum GPA of 3.0 is required for the graduate certificate.

All students, whether working toward a degree or as a non-degree student, are eligible for the certificate.

Choose one course from each of the subfields below:

Courses listed below are examples of courses that can be selected for the certificate, but other graduate-level courses (5000-level or above) in political science may be applied with the consent of the program advisor.

Note: Some courses appear more than once in different subfields; students should choose four different subfield courses, not count one toward two subfields.

International Politics

- PSCI 5224 - Dictatorships in 21st Century
- PSCI 5225 - Democracy and Democratization
- PSCI 5265 - Social Justice And Globalization
- PSCI 5808 - Strategies of Peacebuilding

Comparative Politics

- PSCI 5145 - Indigenous Politics
- PSCI 5224 - Dictatorships in 21st Century
- PSCI 5225 - Democracy and Democratization
- PSCI 5256 - Seminar: National Question and Self-Determination
- PSCI 5555 - International Women's Resistance
- PSCI 5808 - Strategies of Peacebuilding

American Politics

- PSCI 5094 - Seminar: Urban Politics

Political Theory

- PSCI 5265 - Social Justice And Globalization

Capstone

- PSCI 5206 - Social Movements, Democracy and Global Politics

Total: 12 Hours

To
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Design Build Graduate Certificate

Contact: Erik (Rick) Sommerfeld

Telephone: 303-315-0008

E-mail: erik.sommerfeld@ucdenver.edu

The College of Architecture and Planning offers a graduate certificate in the emerging area of design build as an extension of the MArch program. The certificate course work totals 18 credit hours and emphasizes design build from the designer's point of view.

Certificate Requirements

Five courses totaling 18 semester hours can be applied to the MArch graduation requirements:

- ARCH 6370 - Introduction To Design Build
- ARCH 6471 - Managing Quality & Risks
- ARCH 6472 - Architecture in a Single Source Project Delivery
- ARCH 6373 - Construction in Design Build
- ARCH 5140 - Design Studio IV

Total: 18 Hours

Emergency Management and Homeland Security Concentration

The graduate concentration in Emergency Management and Homeland Security is available as a concentration within the MCJ programs, or as a stand-alone certificate for non-degree students. This concentration, which requires 15 credit hours (5 courses), provides advanced education in the management of emergencies, hazards, disasters, and homeland security. Students completing this sequence will have the knowledge and skills necessary to assess and manage a broad range of hazards and disasters, and to understand the policy environment in which emergency management occurs.

Requirements

Students take two of the following three required courses as well as three elective courses approved by their advisor. The three elective courses may be drawn from the student's particular area of interest, such as policy and management, spatial analysis and quantitative assessment, or public safety.

- GEOG 5230 - Hazard Mitigation and Vulnerability Assessment
- PUAD 5650 - Public Policies for Homeland Security and Disasters
- PUAD 5450 - Law of All-Hazards Management

Entrepreneurship Certificate

The Business Schools undergraduate certificates are primarily intended for students currently pursuing a degree in any undergraduate discipline that want to expand their business knowledge to give themselves a leg up when they enter the work force. However, they can also be taken by students with only a high school diploma.

Students can pursue one of our undergraduate certificates, even if they are not CU Denver students. Credit earned as a part of the certificate DOES count towards your undergraduate degree, should you choose to pursue a degree here. One such undergraduate certificate is listed below:

Launchpad Entrepreneurship Certificate

This certificate can be earned in either downtown Denver at the Jake Jobs Center for Entrepreneurship or CU South Denver.

The Jake Jobs Center for Entrepreneurship is offering an affordable program in one of the fastest growing business segments in the country-Innovation and Entrepreneurship. All courses are taught by faculty from the Jake Jobs Center for Entrepreneurship at CU Denver. You will find many opportunities including

scholarships, mentoring, and networking. You will gain skills that prepare you to start a successful business or become an entrepreneurial asset to an existing company.

Benefits:

- Experiential opportunities
- Condensed 8-Week courses
- Two convenient Denver locations
- Cost effective - Scholarships available
- No GPA requirements or prerequisites

For more details about Launchpad courses and registration, visit the Launchpad Certificate page.

The Business Schools also offers post-graduate certificates which are primarily intended to give individuals with an undergraduate degree in any discipline access to business courses that can help them succeed in their current job or even help them launch their own company.

Students can pursue one of our graduate certificates, even if they are not CU Denver students, without taking the GMAT. Credit earned as a part of the certificate DOES count towards your graduate business degree, should you choose to pursue a degree here. One of the post-graduate certificates is listed below:

A Certificate in Entrepreneurship gives students the ability to marshal resources to seize new business opportunities which have uncertain outcomes. The post-bachelors certificate introduces students to fundamental entrepreneurial concepts plus provides the flexibility to allow them to explore specialized areas of interest including cutting-edge social entrepreneurship, new venture design, finance structuring, legal issues, leadership, marketing and personal branding, new product development and business plan creation. Visit the Jake Jabs Center for Entrepreneurship to learn more about our entrepreneurship programs.

Environmental Policy, Management and Law Concentration/Graduate Certificate

The graduate concentration in Environmental Policy, Management and Law is available as a concentration within the MPA program, or as a stand-alone certificate for non-degree students. This concentration, which requires 15 credit hours (5 courses), provides an understanding of how our natural environment is governed and affected by relationships between various entities, including:

- legislatures
- administrative agencies
- courts
- federal, state, and local governments
- government and the nonprofit and private sectors
- government and the public it has been established to serve

The core of the EPML program requires completion of two required graduate seminars, all taught by faculty who specialize in environmental affairs. Then students select three elective courses under faculty advisement.

Requirements

Students must take the following two courses:

- PUAD 5631 - Seminar in Environmental Politics and Policy
- PUAD 5633 - Seminar in Natural Resource and Environmental Health Law

Pre-approved Electives (partial list)

An additional three electives are required, and must be approved by the Concentration Director.

- CVEN 5393 - Water Resources Development and Management
- CVEN 5401 - Introduction to Environmental Engineering
- CVEN 5402 - Integrated Environmental Modeling
- CVEN 5480 - Hazardous Wastes and Site Remediation
- CHEM 4700 - Environmental Chemistry
- CHEM 5710 - Air Pollution Chemistry
- CHEM 5720 - Atmospheric Sampling and Analysis
- URPL 6250 - GIS Analysis
- URPL 6500 - Environmental Planning/Management
- URPL 6549 - Environmental Impact Assessment
- URPL 6510 - Energy/Natural Res. Planning
- ENVS 5030 - Environmental Geology
- ENVS 5500 - Topics in Environmental Sciences
- ENVS 5730 - Air Quality Modeling and Analysis
- ENVS 6200 - Risk Assessment
- ENVS 6210 - Human Health and Environmental Pollution
- ENVS 6220 - Toxicology
- ENVS 6230 - Environmental Epidemiology
- BIOL 5154 - Conservation Biology
- BIOL 5445 - Applied Environmental Biology
- GEOG 5090 - Environmental Modeling with Geographic Information Systems
- GEOG 5265 - Sustainability in Resources Management
- PUAD 5310 - Policy Formulation & Implementation
- PUAD 5320 - Public Policy Analysis
- PUAD 5410 - Administrative Law
- PUAD 5420 - Law and Public Policy
- PUAD 5440 - Negotiation and Conflict Resolution
- PUAD 5625 - Local Government Management
- PUAD 5650 - Public Policies for Homeland Security and Disasters
- PUAD 5710 - Public Sector Technology

Certificate Requirements

Students must take the following two courses:

- PUAD 5631 - Seminar in Environmental Politics and Policy
- PUAD 5633 - Seminar in Natural Resource and Environmental Health Law

An additional three electives are required, and must be approved by the Concentration Director.

Total: 15 Hours

Environmental Science Education Graduate Certificate

► Graduate School Rules apply to this program.

Certificate Advisor: Bryan Wee

E-mail: bryan.wee@ucdenver.edu

Introduction

Please click [here](#) to see Geography and Environmental Sciences Department information.

Certificate Objectives

1. Students will synthesize environmental science content with relevant educational practices
2. Students will recognize, understand and apply environmental science education in either formal or informal educational settings
3. Students will utilize education research methods to support disciplinary learning
4. Students will identify a broader set of career options (see list below)

Sample list of career options

- K-12 Teacher or curricular specialist
- UNICEF/UNESCO/World Heritage Foundation
- National Parks Service or U.S. Forest Service
- Non-profit organizations (e.g. Colorado Alliance for Environmental Education)
- Regulatory Agencies (e.g. U.S. Environmental Protection Agency)
- Environmental and/or Educational Consultancy Firms
- Adjunct lecturer or instructor

Program Delivery

This is both an on-campus and field-based program.

Declaring This Certificate

Please see the Certificate advisor.

General Requirements

Click [here](#) for information about Academic Policies.

Certificate Requirements

Required Courses (6 credit hours)

- ENVS 5340 - Equity & Culture in Science Education: Local/Global
- ENVS 5650 - Environmental Education

Electives (6 credit hours)

Select from the following list of electives. Students should consult with the certificate advisor about other courses that may count toward this requirement.

- ANTH 5170 - Culture and the Environment
- BIOL 5154 - Conservation Biology
- COMM 5282 - Environmental Communication
- GEOG 5265 - Sustainability in Resources Management
- GEOG 5335 - Contemporary Environmental Issues
- GEOG 5440 - Science, Policy and the Environment
- PSCI 5354 - Seminar: Environmental Politics and Policy

Gender-Based Violence Concentration/Graduate Certificate

A student may choose to complete a concentration in gender-based violence studies as part of the MCJ or MPA degree, or the gender-based violence program can be completed by non-degree students as a stand-alone graduate certificate. The program on gender-based violence provides an interdisciplinary perspective on crime, the formulation of laws and codes, the criminal legal system and its intersection with gender and violence. Students seeking a gender-based violence concentration must complete 15 semester hours related to gender-based violence, which are completed via intensive in-person and online hybrid courses that meet periodically throughout a two-year period.

Requirements

Students take the four specified courses below and one elective.

- PUAD 5910 - Nature and Scope of Interpersonal Violence
- PUAD 5920 - The Psychology of Interpersonal Violence
- PUAD 5930 - Interpersonal Violence Law and Policy
- PUAD 5940 - Interpersonal Violence Leadership, Advocacy, and Social Change

Total: 15 Hours

Geographic Information Science Graduate Certificate

► Graduate School Rules apply to this program.

GISci Certificate Advisor: Matt Cross

E-mail: matthew.cross@ucdenver.edu

The intention of this certificate is to provide graduate-level students at CU Denver with the mechanisms for demonstrating capabilities in spatial techniques in the social and/or physical sciences. The focus of this certificate is on a broad array of geo-spatial techniques, including geographic information systems, remote sensing, cartography and statistics, which give students additional analytical skills for the workplace or graduate school. This certificate is designed for majors in GES as well as other disciplines.

Upon successful completion of the certificate, students will be able to:

- understand basic theoretical underpinnings of spatial analysis
- apply geo-spatial technologies to real-world problems
- have a basic knowledge of how to operate at least three types of software used in spatial analytical applications

Application

Spatial techniques are tools with broad application. Consequently, graduate students in any discipline will be admitted into the program. Non-degree seeking students with a prior bachelor's degree may also be admitted. Of the four core requirements, only the statistics class has prerequisites, including algebra and introductory calculus. Because of the technical nature of the GIS and remote sensing course work, however, some mathematical experience is desirable prior to beginning the program. Students may begin the program in any semester or during the summer by making arrangements with the GIS certificate coordinator, and completing and signing the Application for GISci Certificate.

Course Requirements

To obtain the certificate, students must complete four core courses, one elective, and a 1-credit independent study or applied GIS lab, totaling 16 hours. Although the four core courses may be taken in any order, students without any background in the geo-spatial sciences are advised to begin with GEOG 5080, Introduction to Geographic Information Systems, since this course familiarizes students with many key concepts used in the other classes. The statistics class and GEOG 5080 have prerequisites, including algebra and introductory calculus. Because of the technical nature of the GIS and remote sensing course work, some mathematical experience is desirable prior to beginning the program.

In order to obtain the certificate, students must have a 3.0 GPA in all courses required for the program, and the independent project must demonstrate proficiency in GIS in the student's area of interest. All core courses are offered on an annual or bi-annual basis. Any alterations to the program **MUST** be approved by the GISci Coordinator. The certificate will be awarded upon completion of the program.

Prerequisite Course

Note: this course does NOT count as part of the total credits required for the certificate.

- GEOG 2080 - Introduction to Mapping and Map Analysis

Core Courses

- GEOG 5080 - Introduction to GIS
- GEOG 5081 - Cartography and Computer Mapping
- GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing
(May also take as GEOL 5060)
- GEOL 5770 - Applied Statistics for the Natural Sciences
- - OR- ENV5 5600 - Applied Statistics for the Natural Sciences
OR equivalent course approved by the GISci Certificate Coordinator

Total: 12 Hours

Elective (choose two from the following):

- GEOG 5070 - Remote Sensing II: Advanced Remote Sensing
(May also take as GEOL 5070)
- GEOG 5085 - GIS Applications for the Urban Environment
- GEOG 5090 - Environmental Modeling with Geographic Information Systems
- GEOG 5091 - Open Source Software for Geospatial Applications
- GEOG 5092 - GIS Programming and Automation
- GEOG 5095 - Deploying GIS Functionality on the Web
- GEOG 5235 - GIS Applications in the Health Sciences
- CVEN 5382 - GIS Spatial Database Development
- CVEN 5385 - GIS Relational Database Systems

One of these courses may be substituted with an elective approved by the GISci Certificate Coordinator

Total: 6 Hours

Certificate Total: 18 Hours

Geographic Information Systems Graduate Certificate

This certificate is for students who want to get a taste of the geographic information systems (GIS) specialty area before applying for a graduate degree and for professionals who need a working knowledge of GIS. To earn the certificate in GIS, students must complete four of the core GIS classes, equaling 12 semester hours of work. Students can complete this certificate as a master's student or as a nondegree student. Students must already have a baccalaureate degree and must complete any course-specific prerequisites.

Geospatial Information Science Graduate Certificate

Contact: Mike Hinke (Co-coordinator)

Telephone: 303-556-4172

E-mail: michael.hinke@ucdenver.edu

Contact: Austin Troy (Co-coordinator)

Telephone: 303-315-1006

Email: austin.troy@ucdenver.edu

Geospatial Information Science (GIS), known to some as "computer mapping," addresses the storage, management, analysis, synthesis, and display of spatial data and information. In the College of Architecture and Planning we use GIS to analyze and understand space, to answer the place-based questions posed by our stakeholders and our clients, and to create the planning- and research-oriented maps that are critical to communicating with stakeholders. Our work with GIS in the college is built on the many advances in Geospatial Information Science over the last 40 years.

This certificate program is intended for motivated people with a strong interest in the application of GIS to the design and planning professions. It is targeted both at students currently enrolled in a University of Colorado degree program who wish to add a credential to their degree, and working professionals who do not wish to enroll as degree students, but who wish to pursue a certificate to improve job skills.

Students who earn this Certificate through the College of Architecture and Planning at the University of Colorado Denver will exit the program with the following:

1. An understanding of GIS theory and concepts
2. Technical mastery of general GIS methods using ArcGIS, as well as familiarity with remote sensing
3. Familiarity with common public geospatial data sources, as well as metadata standards
4. Knowledge of data interoperability, including how to move data and maps from one software platform to another; examples of software include Adobe Creative Suite, 3D Studio Max, SketchUp, RhinoTerrain, ArcMap, and Quantum GIS
5. Specialized skills in geospatial technologies and methods related to the design and planning professions, including rendering and visualizations, infrastructure and transportation network analysis, cadastral mapping, site selection and analysis, geodesign, and many others

GIS is a rapidly growing field and an increasingly important job skill. GIS skills are showing up as requirements for architects, landscape architects and planners. Our GIS Certificate holders are currently working as: environmental planners, transportation planners, city planners, urban designers, landscape architects, and software developers.

A minimum of a 3.0 GPA in all GIS related course work is required to earn the GIS Certificate.

Course Requirements: 18 semester hours

Part 1: Introductory GIS class (3 semester hours)

- URPL 6250 - GIS Analysis
- LDAR 5540 - Introduction to GIS
- URPL 6800 - Special Topics: Urban and Regional Planning - Introduction to GIS

Part 2: Advanced GIS methods class (3 semester hours)

- URPL 6260 - Advanced Geo-Spatial Methods

Part 3 (3 semester hours)

For Planning and Design Track: Remote Sensing

- GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing
- GEOG 5070 - Remote Sensing II: Advanced Remote Sensing
- OR-
- Boulder: GEOG 4093 - Remote Sensing of the Environment

For Landscape Architecture Track: Computer aided design

- LDAR 6642 - Landscape Architecture Digital Design Workshop
- LDAR 6840 - Independent Study

Part 4: Specialized advanced classes (9 semester hours)

- GEOG 5081 - Cartography and Computer Mapping
- GEOG 5090 - Environmental Modeling with Geographic Information Systems
- GEOG 5085 - GIS Applications for the Urban Environment
- GEOG 5230 - Hazard Mitigation and Vulnerability Assessment
- GEOG 5095 - Deploying GIS Functionality on the Web
- CVEN 5382 - GIS Spatial Database Development
- CVEN 5385 - GIS Relational Database Systems
- CVEN 5800 - Special Topics - Geomatics for GIS
- LDAR 6686 - Special Topics: Landscape Architecture - Advanced Topics in GIS
- Any course from the Part 3 list (either track) not already used to fulfill the Part 3 requirement
- Up to 3 semester hours from a studio course where intensive GIS is used. This must be done by submitting a petition to the coordinators describing the GIS activities undertaken.
- Up to 3 semester hours for an internship using GIS in a planning or design context, also by petition. Please see the coordinators before starting the process of looking for an internship.
- Other relevant courses by permission

Part 5: Portfolio

- A digital portfolio of GIS-related work completed for work undertaken in classes in the College of Architecture and Planning is required as part of the completion of the GIS Certificate.
- Requirements for the portfolio will be made available to students when they sign up for the GIS Certificate.

Note: Students pursuing the GIS Certificate in the College of Architecture and Planning are expected to use GIS data and software in their design and planning related classes.

Students who have completed all of the requirements for the GIS Certificate must submit their GIS Certificate form at the start of the semester that they plan to graduate.

Eligibility and Application

The certificate program is open to all. Applicants already enrolled in a University of Colorado degree program need only submit an internal application to the CAP GIS certificate program. Applicants who are not currently enrolled in a degree program must apply to CU Denver as non-degree seeking students and also submit an application to the CAP GIS certificate program. More details on the process are available from the coordinator.

Historic Preservation Graduate Certificate

Graduate Certificate in Historic Preservation

The University of Colorado Denver Graduate Certificate in Historic Preservation, an interdisciplinary collaboration between the College of Architecture and Planning and the History Department, is awarded by

the History Department. The Certificate Program is open to any qualified graduate student or non-degree seeking student with a bachelor's degree.

The certificate provides CU Denver students and the wider community with foundational knowledge and skills in Historic Preservation, a field that enhances studies and professional work in areas such as architecture, heritage tourism, historic preservation, national park interpretation, public history, urban studies and related fields.

The certificate can stand on its own, can complement a graduate program in Architecture, History, or Urban Planning; or can serve as a beginning to graduate studies. It can also be a stepping stone to further work in Historic Preservation with the College of Architecture and Planning's Masters of Science in Historic Preservation.

Applicants must have a B.A. or B.S. degree.

Interested students must register their intent to complete the Certificate with the Director of the Public History & Preservation Program, CU Denver History Department. Students already enrolled in a graduate program at CU Denver can begin their Certificate work at any point during their studies. Non-degree students must apply to the university as a non-degree seeking student.

All certificate coursework for History students must be approved by the History Department's Historical Preservation advisor, Prof. Tom Noel (tom.noel@ucdenver.edu). CAP students must work with CAP Historic Preservation advisor, Prof. Chris Koziol (christopher.koziol@ucdenver.edu).

The History Department expects that all courses in the certificate program will be taken in residency at CU Denver. Students must maintain a 3.0 GPA, and no course below B- will count towards the certificate.

Graduate students in the History Department can count courses for both their major or minor fields and the requirements for the certificate.

Certificate in Historic Preservation: 18 credits

Required Courses (6 hours):

- HIST 5232, Historic Preservation or HIST 6989, Historic Preservation Seminar (listed as a topics course - check for the title) (3 credits) One of these courses is offered once a year by the History Department
- HIPR 6010 Preservation Theory and Practice (3 credits) This course is offered every fall by the College of Architecture & Planning

Optional Courses (to complete the 18 credit hours required). These remaining 12 credit hours should be distributed so that at least 3 hours are from each of the two participating colleges, CLAS and CAP, and hence, no more than 9 hours from the other. Be sure to consult your preservation advisor (Profs. Koziol or Noel) on your course selection.

- HIST 6950, History Thesis Project (3 credits) or HIST 6952 Public History Project related to preservation (3 credits)
- HIST 5939, Heritage Tourism (3 credits)
- HIST 5939 or HIPR 6930 Internship (3 credits)
- HIST 5229, Colorado Historical Places (3 credits) HIST 6989, Historic Preservation Seminar (3 credits)

- HIST 5240 , National Parks History (3 credits)
- HIST 5228, Western Art & Architecture (3 credits)
- ARCH 6210, History of American Architecture (3 credits)
- ARCH 6212, History of Modern Architecture (3 credits)
- HIPR 6110, Regionalism(s) & Vernacular in Context (3 credits)
- HIPR 6210, Survey, Significance, and Recognition (3 credits)

Admissions Requirements

1. Applicant must have a B.A. or B.S. Degree
2. Applicant applies to the Director of the Public History & Preservation Program, CU-Denver History Department
3. Applicants must provide a transcript, statement of purpose, and two letters of recommendation

Integrated Construction, Management + Leadership Graduate Certificate

Contact:

Business School: Linda Brooker
303.315.8200
linda.brooker@ucdenver.edu

College of Engineering and Applied Science | Civil Engineering: Roxanne Pizano
303.556.2871
roxanne/pizano@ucdenver.edu

College of Architecture and Planning: Leo Darnell
303-315-1015
leonard.darnell@ucdenver.edu

The colleges of Architecture and Planning, Engineering and Applied Science, and the Business School at the University of Colorado Denver have formed a partnership to create an innovative and interdisciplinary leadership program. The Integrated Construction, Management and Leadership (ICML) Certificate is a four-course certificate designed to launch designers, architects, engineers, and business entrepreneurs into the world of construction or rapidly update an existing skill-set.

All classes are held in the Liniger Building at CU South Denver, located east of Interstate 25 on Lincoln Avenue in Parker, Colorado. Go to the CU South Denver website to see the class schedule.

As disciplinary identities, project boundaries, and conventional markets blur, leadership, management skills, and civic mindfulness are key aspects to successfully navigating a rapidly transforming 21st century built environment. Many new ideas are emerging involving how projects are conceived and delivered that better integrate the complex relationships among finance, marketing, design, and construction. These new interdisciplinary management and construction techniques streamline the construction of increasingly large-scale and complex projects. Leadership skills are necessary for success in the central activities of contemporary engineering, architectural design firms, business, government, and non-profits. The demands of project management in firms today involve more than a specific technical expertise in a given field.

Firms need creative individuals who can effectively innovate, execute, and communicate across disciplines. This new certificate program capitalizes on these changes and the new opportunities they present.

ICML is an interdisciplinary program designed for working or aspiring professionals, and upper level students interested in expanding their knowledge base in the fields of engineering, architecture, business, and their intersections. The courses include introductions to and explorations of current trends in the construction industry, project management and building information modeling (BIM). The final course is an integrated course that brings together top executives in the architecture, engineering and construction (AEC) business to discuss current industry topics and provides students an opportunity to apply principles from the various fields to case study projects.

- Students can earn graduate level credit for each course they successfully complete and the ICML Certificate upon completion of all four courses.
- They can take the courses as a non-degree student or while enrolled in a degree program at the University of Colorado Denver.
- The courses can be used to partially fulfill requirements for the MEng in Construction Engineering and Management or other eligible graduate programs such as the Master of Architecture degree upon acceptance into these programs.
- Approved courses in this Certificate may also count toward related Certificates offered by the Business School and Construction Engineering and Management.

Certificate Requirements

Four courses totaling 12 semester hours:

- ARCH 6420 - Integrated Practice & BIM Technology
- BANA 6650 - Project Management
- CVEN 5235 - Advanced Construction Engineering
- CVEN 5238 - Integrated Construction Leadership

If these courses are not offered in a given semester with permission other courses with similar scope and level may be substituted.

Total: 12 Hours

Interpersonal Violence and Health Care Graduate Certificate

The Certificate in Interpersonal Violence and Health Care (CIVHC) fulfills a nationally recognized need to educate and train individuals from a broad range of health disciplines to effectively respond to victims of interpersonal violence. CIVHC is a program of the Center on Domestic Violence in CU Denver's School of Public Affairs, developed in collaboration with local and national advisors representing schools of nursing, medicine and dentistry, as well as knowledgeable health practitioners skilled in meeting the needs of patients experiencing interpersonal violence. CIVHC is the first graduate level program of its kind. As a distance learning program it represents a collaboration within the University of Colorado system-the Downtown Campus, the Anschutz Medical Campus and the Colorado Springs Campus. Its goal is to provide education for health professionals, faculty and students, thereby building proficiency and confidence in interpersonal violence prevention, identification and intervention in Colorado and the nation.

At the completion of this certificate program, participants will have:

- Leadership skills necessary to improve systematic responses to interpersonal violence in health care settings
- Thorough understanding of the health ramifications of interpersonal violence
- Skill and comfort with screening all patients for interpersonal violence-victims, offenders and child witnesses
- Ability to effectively assess and treat adults and children engaged in violent relationships
- Ability to build resources to meet the needs of patients including, but not limited to, collaboration with community based providers.

Four courses are required for completion of this certificate. Please contact the Director of the Center on Domestic Violence at barb.paradiso@ucdenver.edu for more information.

Local Government Concentration and Graduate Certificate

Local government is the most rapidly growing area of the public sector employment across the country, providing jobs in municipalities, counties, regional authorities, and councils of government.

The Local Government Concentration allows Master of Public Administration students to become well-versed in the forces that shape the agendas of these offices and agencies and gain an understanding of government management and policy making. MPA students who wish to earn a concentration in Local Government must take two of the following courses as part of their electives:

Non-degree students may earn a Local Government Certificate by completing 15 credit hours (5 courses) in topics approved by the Concentration Director.

For more information, contact:

Dr. Allan Wallis, Local Government Concentration Director & Associate Professor
University of Colorado Denver
School of Public Affairs
Phone: (303) 315-2829
Fax: (303) 315 - 2229
E-mail: Allan.Wallis@ucdenver.edu

Certificate Requirements

Students take at least two of the four courses listed below:

- PUAD 5503 - Public Budgeting and Finance
 - PUAD 5625 - Local Government Management
 - PUAD 5626 - Local Government Politics and Policy
 - PUAD 5628 - Urban Social Problems
- Electives approved by advisor (3) (6-9 semester hours)

Total: 15 Hours

Nonprofit Organizations Graduate Concentration/Certificate

The graduate concentration in Nonprofit Organizations is available as a concentration within both the MPA and MCJ degree, or as a stand-alone certificate for non-degree students. This program prepares students to become innovative and critical thinkers in the areas of nonprofit organizational management and public policy, with a unique approach that bridges theoretical knowledge with real-world experience. As students prepare for their careers or advancement in their current positions, they gain insight into the interdependence between the nonprofit, public, and for-profit sectors. Graduates are able to span the boundaries of these three sectors to assess community needs, navigate the realm of public policy, and strategically and effectively manage organizations that ultimately benefit society.

Requirements

Students take two required courses as well as three electives approved by the concentration advisor, for a total of 15 hours.

- PUAD 5110 - Seminar in Nonprofit Management
- PUAD 5140 - Nonprofit Financial Management

Post-Graduate Certificates

The Business School's post-graduate certificates are primarily intended for professionals in the community with a master's degree, in any business discipline, from an AACSB accredited institution. These certificates are offered in a variety of specialized business areas from Business Analytics to Information Systems. The courses are designed to allow individuals that are already in the business community to bring their skills up to date - or to explore a new area of business that interests them.

Students are required to complete four graduate courses in order to receive a post-graduate certificate. Students can pursue one of our post-graduate certificates, even if they are not CU Denver students. Credit earned as a part of the certificate DOES count towards a second graduate business degree, should you choose to expand your knowledge further with one of our complete MS or MBA degrees.

We currently offer post-graduate certificates in:

- Bioinnovation and Entrepreneurship
- Business Intelligence
- Business Strategy
- Change Management
- Commodities
- Digital Health Entrepreneurship
- Enterprise Risk Management
- Enterprise Technology Management
- Entrepreneurship
- Finance
- Health Information Technology
- Human Resources Management
- Information Systems
- International Business
- Leadership

- Managing for Sustainability
- Marketing
- Risk Management and Insurance
- Sports and Entertainment Management
- Technology Innovation and Entrepreneurship
- Web and Mobile Computing

Some of the post-graduate certificates require prior knowledge in the area being studied, Please contact an advisor for specific courses and requirements for the post-graduate certificates.

Public, Nonprofit and Community Leadership Graduate Certificate

Introduction

Please click [here](#) to see Political Science department information.

The Public, Non-Profit and Community Leadership Graduate Certificate is offered in two different formats: the traditional, on-campus format, and the New Directions weekend classes format, with classes offered in CU Denver facilities south of Denver (either at the Liniger Building in Parker, or at Fort Lewis College in Durango). Students can choose either of these two pathways to complete the certificate.

Public, Non-Profit and Community Leadership Graduate Certificate: On-Campus Pathway

The CU Denver Political Science Department's Public, Non-Profit and Community Leadership Certificate engages students in a focused curriculum in the community organizing and development field, including field placements in internships with local community partners. The program curriculum is anchored around the study and practice of local civic engagement, especially in traditionally marginalized communities. Students will be connected to meaningful work and networking opportunities in those communities, through community-based coursework, internships and service-learning opportunities. The certificate program provides critical education and effective skills-based training for students seeking careers in community organizing and development, as well as for students seeking more active citizenship and civic engagement. Students will be prepared to become change agents in their communities, while developing possible career paths in community-based advocacy/service organizations, public agencies, or international development work.

Curriculum and Credit Requirements: On-Campus Pathway

The graduate certificate requires four "public leadership" courses (12 credits), which must include PSCI 5914 - Community Development and an appropriate field study (internship) course (with the default course being PSCI 5944 - CU in the City).

Required Public Leadership Courses (6 credits)

- PSCI 5914 - Community Development

Field Placement Requirement, fulfilled by ONE of the following courses:

- PSCI 3914 - The Urban Citizen

- PSCI 5944 - CU in the City
- PSCI 5939 - Internship (including opportunities in the Colorado State Legislature)

Elective Public Leadership Courses (6 credits)

- PSCI 5025 - Local Governance and Globalization
- PSCI 5094 - Seminar: Urban Politics
- PSCI 5024 - State Politics: Focus on Colorado
- PSCI 5206 - Social Movements, Democracy and Global Politics
- PSCI 5265 - Social Justice And Globalization
- PSCI 5274 - Conflict Resolution and Public Consent Building
- PSCI 5324 - Politics, Public Policy and Leadership
- PSCI 5414 - Organizational Change Agents
- PSCI 5555 - International Women's Resistance
- PSCI 5008 - Graduate Topics in Political Science (when relevant and approved by Program Advisor)
- PSCI 5840 - Independent Study: PSCI (when relevant and approved by Program Advisor)
- Public Leadership Course credits may also be earned through study abroad in the Sustainability in Berlin program (3 credits) or the Development in East Africa program (3 credits).

Public, Non-Profit and Community Leadership Graduate Certificate: Center for New Directions Weekend Pathway

The Center for NEW DIRECTIONS in Politics and Public Policy offers a formally transcribed graduate certificate in Public, Nonprofit, and Community Leadership to meet the needs of individuals in formal public and nonprofit positions that require development of their leadership competencies and for individuals in informal community leadership positions who want to build their knowledge, skills, and effectiveness. This certificate will help human resources directors in local governments and nonprofit organizations who are seeking additional leadership development for the department heads and other individuals they want to groom for succession to leadership. The certificate is open to non-degree seeking students (with or without an undergraduate degree) as well as students formally admitted to the MA in Political Science and to upper division undergraduates seeking to get a head start on their graduate studies.

The certificate can be earned entirely through classes offered in a weekend format.

Students who successfully complete the certificate program would be allowed to transfer in the credits received in the certificate program to complete the Master's Degree in Political Science with emphasis in Politics and Public Policy offered through the Center for NEW DIRECTIONS in Politics and Public Policy in the Political Science Department at the University of Colorado Denver. Transfer of credits would follow completion of the formal application for admission and follow the established review for acceptance of transfer credits.

Prospective students for programs other than the MA in Political Science with emphasis in Politics and Public Policy should verify with their proposed graduate program to determine the number of credit hours that may be accepted for transfer credit for other MA degrees.

Curriculum and Credit Requirements: New Directions Weekend Pathway

9 credit hours must be successfully completed with a grade of B- or better. All courses are currently offered in the extended studies weekend format at the Liniger Building in Parker and on the Fort Lewis College campus in Durango, CO.

Required Courses

Take both of the courses below:

- PSCI 5324 - Politics, Public Policy and Leadership
- PSCI 5644 - Ethical Responsibilities of Leaders

Elective Courses

Take one of the courses below:

- PSCI 5009 - Politics of the Budgetary Process
- PSCI 5084 - Local Government and Administration
- PSCI 5274 - Conflict Resolution and Public Consent Building
- PSCI 5374 - Public Priorities for the 21st Century
- PSCI 5414 - Organizational Change Agents

*Please note, required courses will be offered every year. Some combination of elective courses will be offered each year to assure sufficient choice for certificate completion in that year.

Admissions and Declaring This Certificate

Any student wishing to declare this certificate should schedule a certificate advising appointment with either the Department Chair, the Department Undergraduate Advisor, or the NEW DIRECTIONS office in order to register their intent to pursue the Community Leadership Certificate and to develop a curriculum plan.

Individuals who are not currently admitted students seeking the graduate Public, Nonprofit, and Community Leadership Certificate would use the "quick admit" feature online or the extended studies admissions form previously developed by the College of Liberal Arts and Sciences.

Students requesting admission to the MA in Political Science program would need to complete the application for admissions (undergraduate or graduate, respectively) and be formally admitted by the department (and Graduate School for prospective graduate students) prior to requesting transfer of their certificate credits for their degree program. Please note: completion of the Graduate Certificate in Public, Nonprofit, and Community Leadership does not obligate the individual to pursue further education. The Certificate can be earned as a stand-alone University certificate, or it can be applied to a current or future degree program.

Currently admitted upper division undergraduates should schedule certificate advising appointments with the NEW DIRECTIONS office to register their intent to pursue the Public, Nonprofit, and Community Leadership Certificate. Then they may register for classes as usual.

Risk Management and Insurance Certificate

The Business Schools undergraduate certificates are primarily intended for students currently pursuing a degree in any undergraduate discipline that want to expand their business knowledge to give themselves a leg up when they enter the work force. However, they can also be taken by students with only a high school diploma.

Students can pursue one of our undergraduate certificates, even if they are not CU Denver students. Credit earned as a part of the certificate DOES count towards your undergraduate degree, should you choose to pursue a degree here. One such certificate is our Risk Management and Insurance Certificate. Information for that certificate is below:

Broaden your knowledge of Risk Management and Insurance (RMI) by completing a one-year Certificate in RMI Studies from the University of Colorado Denver. By completing three semester-long RMI courses, all available online, and meeting prior finance course requirements, you will be on your way to enhancing your personal knowledge and providing your employer with RMI awareness and professional skills. See the Risk Management and Insurance Certificate page for more information.

Scientific Foundations of Technical Innovation Certificate

The goal of this certificate is to give students and working professionals an opportunity to broaden their technical knowledge while contributing to regional economic development. Two real-world projects—one for a client and one for the student's own pursuits—are combined with a series of six short courses to provide both context and substance for gaining knowledge needed to create technical prototypes. The model is based on the method by which most physical science graduate students learn technical domains on a "just-in-time" basis. It is also a method by which many corporations quickly bring new project team members up to speed on project knowledge. Entry into the certificate program requires prior completion of two semesters of calculus-based physics and two semesters of calculus **or** permission of the certificate advisor.

Undergraduate required courses

- PHYS 4850 - Physics for Design and Innovation I
- PHYS 4400 - Topics in Scientific Instrumentation and Laboratory Methods
Choose six 1-semester-hour short courses out of a larger list of offered topics; the specific sequence must be approved by the certificate advisor
- PHYS 4852 - Physics for Design and Innovation II

Total: 12 Hours

Graduate required courses

Graduate versions of the courses (5000-level) require an undergraduate degree and additional work on technical analysis or connection to professional practice.

- PHYS 5850 - Physics for Design and Innovation I
- PHYS 5400 - Topics in Scientific Instrumentation and Laboratory Methods
Choose six 1-semester-hour short courses out of a larger list of offered topics; the specific sequence must be approved by the certificate advisor.

- PHYS 5852 - Physics for Design and Innovation II

Total: 12 Hours

Strategic Communication Graduate Certificate

► Graduate School Rules apply to this program.

Strategic Communication has been defined as the management function that entails planning, research, publicity, promotion and collaborative decision-making to help any organization's ability to listen to, appreciate and respond appropriately to those persons and groups whose mutually beneficial relationships the organization needs to foster as it strives to achieve its mission and vision. The Graduate Certificate in Strategic Communication is designed to provide students with the principles and theories that guide the work of public relations practitioners in commercial, public and nonprofit contexts.

Non-degree students who enroll in the MA program following completion of the certificate may transfer up to 12 hours of credits earned for the certificate into credits for the MA degree. The certificate also is designed for students enrolled in a CU Denver's master's program, including the Department of Communication's MA program. For such students, the certificate can be completed as part of or in addition to the coursework required for the master's degree.

Recipients of the Undergraduate Certificate in Strategic Communication are ineligible to complete this certificate.

Grade and Residency Requirements

A grade of *B* must be earned in each course completed as part of the certificate. All of the credit hours for the certificate must be earned at the University of Colorado Denver.

Application Procedures and Additional Information

Students should apply for the Graduate Certificate in Strategic Communication after the completion of the required courses. To apply, students must complete the certificate application, attach it to an unofficial transcript, and return it to Dr. Hamilton Bean in room 3010 of the Student Commons Building, or mail to Department of Communication; P. O. Box 173364, Campus Box 176; University of Colorado Denver; Denver, CO 80217-3364. The approved certificate is mailed to the student after final grades are posted for the semester.

Students who are not already enrolled at CU Denver must also complete an Application for Non-Degree Admission prior to registering for courses. The form should be returned to the Office of Admissions.

Additional information about the Graduate Certificate in Strategic Communication may be obtained from Dr. Hamilton Bean, Department of Communication, Student Commons Building, 1201 Larimer Street, Suite 3010, 303-315-1909, Hamilton.Bean@ucdenver.edu.

Certificate Requirements

The Graduate Certificate in Strategic Communication requires 12 semester hours (four courses):

- COMM 5051 - Advanced Strategic Communication
 - COMM 5240 - Organizational Communication
 - COMM 5939 - Internship
 - An elective at the graduate level from the College of Arts & Media, School of Business, the School of Public Affairs, or the Anschutz Medical Campus. The elective must be approved in consultation with the Department of Communication.
- Students may be permitted to take courses other than those listed above to fulfill the requirements for the certificate if those courses fit their professional goals better. Requests for approval for substitute courses, including an explanation for the substitution, must be made in writing to Dr. Hamilton Bean.

Sustainability Certificate

The Business Schools graduate certificates are primarily intended to give individuals with an undergraduate degree in any discipline access to business courses that can help them succeed in their current job or even help them launch their own company.

Students can pursue one of our graduate certificates, even if they are not CU Denver students, without taking the GMAT. Credit earned as a part of the certificate DOES count towards your graduate business degree, should you choose to pursue a degree here. Listed below is information on one such certificate.

The Managing for Sustainability Certificate is designed for business professionals seeking a deeper understanding of sustainability and/or the technical knowledge to lead sustainability initiatives in their companies. To earn a Managing for Sustainability Certificate, students complete four semester-long graduate Business School courses. Two of the courses provide a foundation in sustainable business practices then, students select their remaining two certificate classes covering such specialized areas as finance, marketing, accounting, and social entrepreneurship. See the Managing for Sustainability Certificate page for more information.

Sustainable Urban Agriculture Graduate Certificate

Certificate Advisor: Amanda Weaver

E-mail: amanda.weaver@ucdenver.edu

Introduction

Please click [here](#) to see Geography and Environmental Sciences Department information.

The goal of the certificate program is to provide GES students advanced training in sustainable urban agriculture through the integration of university classroom study and field-based practicum conducted at the department's field research station. Requirements for the certificate are therefore divided between on-campus courses and field courses.

Upon successful completion of the certificate, students will:

- Have knowledge of the history of urban farming
- Understand the modern agro-food system
- Participate in sustainable urban agricultural practices

Program Delivery

This is both an on-campus and field-based program.

Declaring This Certificate

- Please see the Certificate advisor.

General Requirements

- Click here for information about Academic Policies.

Certificate Requirements

Take **all** of the following courses (6 credit hours):

- ENV5 5450 - Urban Food and Agriculture: Perspectives and Research
- ENV5 5460 - Sustainable Urban Agriculture Field Study I

Take **four** of the following elective courses (12 credit hours):

- ENV5 5470 - Sustainable Urban Agriculture Field Study II
- GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing
- GEOG 5085 - GIS Applications for the Urban Environment
- GEOG 5265 - Sustainability in Resources Management
- GEOG 5640 - Urban Geography: Denver and the U.S.
- GEOG 5680 - Urban Sustainability: Perspectives and Practice
- GEOG 5939 - Internship (a sustainable agriculture internship with a local food/ urban agriculture community organization)

Sustainable Urban Infrastructure Graduate Certificate

This certificate is for students and working professionals who seek an interdisciplinary curriculum in the broad field of sustainable infrastructure to address complex water, energy, built environment and transportation challenges using engineering and social science strategies. Students must already have a baccalaureate degree.

Teaching English Language Learners Graduate Certificate (CTELL)

- Graduate School Rules apply to this program.

Program Advisor: Hongguang (Ian) Ying, Associate Professor

Office: 1050 Ninth Street Park, Room 100

Telephone: 303-556-6728

E-mail: Hongguang.Ying@ucdenver.edu

Program Description

To meet the increasing needs of individuals seeking advanced training in teaching English as a second language, the English department at CU Denver offers a graduate Certificate in Teaching English Language Learners (CTELL).

The certificate program, which can be completed through CU Online, is designed to build the necessary skills to teach adults English as a second language through focused preparation. It is primarily aimed at native speakers of English who want to teach overseas, but may serve the needs of international students wanting to teach English in their home country or other countries.

Upon successful completion of the program, CTELL participants will be able to:

- Discuss the theoretical basis of second language instruction
- Demonstrate a variety of effective ESL teaching techniques
- Explain, in pedagogically relevant ways, the linguistic structures of the English language

Curriculum

The curriculum consists of 12 semester hours (9 semester hours of required courses, and three semester hours of electives). The required courses must be taken at CU Denver. A GPA of 3.0 or better is required for all graduate courses.

Required Courses

- ENGL 5171 - Language Theory
- ENGL 5601 - Principles and Practices of Second Language Acquisition
- ENGL 5651 - Second Language Writing

Total: 9 Hours

Elective Courses

- ENGL 5093 - Teaching of Writing
- An alternative elective such as a special topic course (i.e., ENGL 5190 Special Topics in Rhetoric and Writing) approved by the program advisor.
- An internship (ENGL 5939 Internship) approved by the program advisor.

Total: 3 Hours

Total: 12 Hours

Additional Information

LENGTH OF TIME

The course of study will typically last one academic year, including the summer session.

WHEN YOU MAY BEGIN

You may begin in any semester. There is no fixed deadline for application for admission.

PREREQUISITES

All applicants must have a bachelor's degree or the equivalent, with a 3.0 GPA, to be accepted to the program. Graduate students at CU Denver will also be permitted to apply for the certificate while they are concurrently completing another graduate degree. Permission may not be granted to graduate students in the applied linguistics option of the Master of Arts in English program.

Non-native speakers of English are required to submit an official TOEFL (Test of English as a Foreign Language) report showing a score of at least 600. Those who score below 600 but above 500 on the TOEFL may be admitted conditionally to the program. Under these conditions, students will have their English language skills assessed by the faculty of the program immediately after they arrive on campus to determine whether further courses are needed to develop English language proficiency. After assessment, the students may be assigned to full-time language study in an intensive English program, permitted to take graduate-level classes on a conditional basis along with further designated language study or permitted to begin graduate study without further restrictions.

Water Resources Engineering for Urban Watershed Management Graduate Certificate

The Certificate of Water Resources Engineering for Urban Watershed Management is for students who seek an interdisciplinary curriculum in the field of hydrologic and hydraulic engineering to analyze water-related problems and to obtain knowledge pertaining to applied hydrology, flood channel design, urban runoff modeling, flood mitigation and floodplain management. To earn the certificate, applicants must already have a baccalaureate degree and complete four core courses offered in the Hydrology and Hydraulics Graduate Engineering Program or equivalent continuing education courses equaling 12 semester hours of work. Applications for this certificate shall be submitted for the Hydrology and Hydraulics Graduate Engineering Program for approval. Call the Department of Civil Engineering at 303-556-2871 for more information.

Women's and Gender Studies Graduate Certificate

► Graduate School Rules apply to this program.

The Women's and Gender Studies Graduate Certificate is administered through the Women's and Gender Studies program in the College of Liberal Arts and Sciences at the University of Colorado Denver. It is designed to provide members of the CU Denver population and public with specialized knowledge of the history, politics, literature and social practices related to women's and gender concerns. Students must complete 12 credit hours of course work in order to receive the certificate. Acceptance into the certificate program is subject to CU Denver Graduate School Rules.

The WGST certificate is available to any qualified graduate student or non-degree seeking, graduate-level student at CU Denver. Students begin with a required, graduate-level methodology or foundational course before pursuing a combination of WGST-related course work. Upon completion of the certificate, students will have foundational and theoretical knowledge of the major concerns of women's and gender studies.

All prospective students must complete and submit an application to the program. Upon admission to the certificate program, students are eligible for the certificate. All course work must be taken at CU Denver.

Courses

(Please note that some of the following courses may have prerequisites that *must* be met.)

Required Course

Choose one of the following:

- SSCI 6010 - Methods and Theories of Feminism and Gender Studies
- -OR- WGST 6010 - Methods and Theories of Feminism and Gender Studies
- ENGL 5306 - Survey of Feminist Thought
- -OR- HIST 5306 - Survey of Feminist Thought
- -OR- WGST 5306 - Survey of Feminist Thought

Total: 3 Hours

Elective Courses (choose three)

These courses must be explicitly women's and/or gender and/or identity-based courses. They can be taken through any CU Denver department or program with the approval of an advisor. Only one 4000-level elective may be counted toward the certificate. All other course work must be 5000-level or above.

The following is a representative listing of WGST-related courses that may be taken toward the certificate; it is not comprehensive. Please note that some of these courses may be taught sporadically. Students should meet with their advisor to plan their course of study.

- ANTH 5200 - Gender in Cross-Cultural Perspective
- COMM 5020 - Feminist Perspectives on Communication
- COMM 5265 - Gender and Communication
- CRJU 5553 - Women and Crime
- ENGL 4510 - Whores and Saints: Medieval Women
- -OR- ENGL 5510 - Whores and Saints: Medieval Women
- ENGL 5000 - Studies of Major Authors
(depending on author being studied; e.g., Virginia Woolf, George Sand, etc.)
- ENGL 5306 - Survey of Feminist Thought
- -OR- HIST 5306 - Survey of Feminist Thought
- -OR- WGST 5306 - Survey of Feminist Thought
- ETST 4555 - International Women's Resistance
- -OR- PSCI 5555 - International Women's Resistance
- ETST 4827 - Women and the Law
- -OR- PSCI 4827 - Women and the Law
- HIST 5303 - Sex and Gender in Modern Britain
- HIST 5307 - History of Sexuality
- HIST 5345 - Gender, Science, and Medicine: 1600 to the Present

- HUMN 5720 - Sexuality, Gender and Their Visual Representation
- -OR- SSCI 5720 - Sexuality, Gender and Their Visual Representation
- PSCI 4215 - Women's Rights, Human Rights: Global Perspectives
- PSCI 4564 - Gender and Politics
- PSCI 5245 - Gender, Globalization and Development
- PUAD 5910 - Nature and Scope of Interpersonal Violence
- PUAD 5920 - The Psychology of Interpersonal Violence
- PUAD 5930 - Interpersonal Violence Law and Policy
- SOCY 5550 - Seminar: Sociology of the Family
- SSCI 6010 - Methods and Theories of Feminism and Gender Studies
- -OR- WGST 6010 - Methods and Theories of Feminism and Gender Studies
- WGST 5900 - Smart Girl Coaching Training and Practicum

Total: 9 Hours

For more information about this certificate program, contact the Women's and Gender Studies Director, Gillian Silverman, 303-556-4529, or Margaret Woodhull, 303-352-3926.

Courses

See a list of All Courses by Course Type.

ACCT 2200 - Financial Accounting and Financial Statement Analysis

The financial accounting process, the role of the profession and the analysis of financial statements. Principal focus on interpretation of financial statements, with emphasis on asset and liability valuation problems and the determination of net income. Prereq: MATH 1070 OR MATH 1110 with a grade of C- or higher. Restriction: Restricted to undergraduate students at a sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 2220 - Managerial Accounting and Professional Issues

Introduces managerial accounting. Shows managers how to use accounting information to make decisions. Principal focus on cost behavior analysis, budgeting and product costing. Prereq: ACCT 2200 with a grade of 'C-' or higher. Restriction: Restricted to undergraduate students at a sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 2550 - Introductory Accounting for Entrepreneurs and the Arts

An integration of financial and managerial accounting processes as they relate to Entrepreneurs, Arts & Media managers and similar applications. This course will cover the analysis and interpretation of financial statements, asset and liability valuation and the determination of net income. Incorporates the use of accounting information to make decisions focusing on cost behavior analysis, budgeting and product costing in entrepreneurial and arts related businesses. Prereq: MATH 1070 or 1110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 3220 - Intermediate Financial Accounting I

An intensive analysis of generally accepted accounting principles, accounting theory, and preparation of annual financial statements for public corporations. A grade of C or higher is required in this course to proceed to the next level ACCT course or receive credit for the CPA license. Prereq: ACCT 2220 and DSCI/BANA 2010 both with a grade of 'C-' or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 3230 - Intermediate Financial Accounting II

Selected topics not covered in ACCT 3220. A grade of C or higher is required in this course to proceed to the next level ACCT course or receive credit for the CPA license. Prereq: ACCT 3220, completed with a grade of a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 3320 - Intermediate Cost Accounting

Cost accounting links financial and managerial accounting and emphasizes communication between accountants and managers. Topics include managerial uses of cost data for decision making, analysis of activities and cost behavior, the role of accounting in planning and control, and computer-assisted decision modelling. A grade of C or higher is required in this course to proceed to the next level ACCT course or receive credit for the CPA license. Prereq: ACCT 2220 and DSCI/BANA 2010 both with a grade of 'C-' or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 3939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. To enroll in an internship, students must work with the Experiential Learning Center on campus and have a 2.40 GPA or higher. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ACCT 4030 - Financial Accounting

Analysis of financial accounting concepts, the development of accounting thought and principles and critical review of generally accepted accounting principles. (Not recommended for candidates planning to sit for the CPA examination.) Note: Students who have taken ACCT 3220 or ACCT 3230 (or equivalent) may not take this course. Prereq: ACCT 2200 and ACCT 2220 or equivalent. Must have a 'C' or better in courses. Strictly enforced. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4054 - Accounting Systems and Data Processing

The design and analysis of accounting information systems, with special emphasis on computers and computer programming, and the role of accounting in the management process. Must earn a grade of 'C' or better to qualify for graduation. Prereq: ACCT 3220 with a grade of C or higher and ISMG 2050 with a grade of 'C-' or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ACCT 6054. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4070 - Management Accounting

Designed to provide students with a foundation in management accounting models and information, with emphasis on management decision making uses of accounting information. (Not recommended for candidates planning to sit for the CPA examination.) Prereq: ACCT 2200 and 2220 or equivalent with a grade of a 'C' or better. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Note: Students who have taken ACCT 3320 or its equivalent may not take this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4240 - Advanced Financial Accounting

Advanced financial accounting concepts and practices with emphasis on accounting for partnerships, business combinations and consolidations. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3230 with a grade of a 'C' or better. Strictly enforced. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ACCT 6024. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4280 - Professional Judgment and Ethical Decisions in Account

Accounting is a process of providing economic information useful for decision making. This course provides (1) an opportunity to develop professional judgment skills, and (2) tools to make better decisions through an active, case-oriented learning method. Cases involve representative problems professional accountants face in financial reporting, audit, tax, business services, and practice management, including ethical conflicts and technical decisions. Participants learn to apply a structured decision model, incorporating critical, creative, evaluative and reflective judgment processes and learn how to recognize and avoid common decision errors and biases. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT3220 with a C or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4282 - Capitalism, Accounting and Ethical Choices

Examines the development of the U.S. economy from 1850 to today with emphasis on the ethics of accounting, capitalism, and government controls. Prereq: ACCT 3220 with a C or higher or permission. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4330 - Managerial Accounting Problems and Cases

Critical analysis of advanced topics in managerial accounting. Considerable use of cases and current readings. Prereq: Completion of ACCT 3320 with a grade of 'C'. Strictly enforced. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4370 - International Accounting

Designed to expose students to the international aspects of accounting and financial management. Includes discussion of some of the different financial accounting practices across countries; financial statement analysis in a global context, international auditing practices and procedures, international tax implications and the implications of operating within the regulations of the Foreign Corrupt Practices Act, the European Union, North American Free Trade Agreement and General Agreement on Tariffs and Trade. Prereq: Completion of ACCT 3220 with a grade of 'C' or better. Strictly enforced. Cross-listed with ACCT 6370 and INTB 6370. Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4410 - Income Tax Accounting

Provisions and procedures of federal income tax laws and requirements affecting individuals and business organizations, including problems of tax planning and compliance. Note: Students cannot receive credit for both ACCT 4410 and ACCT 6140. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3220 with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ACCT 6140. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4490 - Experiential Learning

Designed to provide practical knowledge on developing a professional practice in accounting or financial management. Topics: Marketing, operating a professional practice. Lectures, guest speakers student projects. Prereq: ACCT 3220 completed with a 'C' or better, or permission of instructor. Cross-listed with ACCT 6490. Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4520 - Oil and Gas Accounting

The Oil and Gas Accounting course is designed to give students an overview of the oil and gas industry and the particular accounting issues this industry faces. The focus is on the oil and gas industry but many of the issues discussed are appropriate and applicable to all energy-related entities. This is a valuable learning experience for those interested in acquiring an understanding of the accounting issues for energy management firms in preparation for entry into public accounting. The course enjoys support from the energy industry in the form of guest speakers and project ideas. Prereq: ACCT 3220 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ACCT 6520. Max Hours: 3 credits. **Semester Hours:** 3 to 3

ACCT 4620 - Auditing Theory

Auditing Theory: Focus on the professional responsibilities of CPAs, generally accepted auditing standards, and PCAOB auditing standards, with emphasis on the theory underlying the development of standards, objectives and procedures. Students cannot receive credit for both ACCT 4620 & ACCT 6020. Note: A grade of C or higher must be earned to receive credit for the CPA license. A grade of B or higher must be earned if planning to take 6025 in the future. Prereq: ACCT 3220 and 4054 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ACCT 6020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4625 - Auditing Practice

Focus on the application of generally accepted auditing standards and PCAOB auditing standards to practice. Emphasis on procedures used by CPAs to gather and document audit evidence. Prereq: ACCT 4620 with a grade of C (2.0) or higher. Note: A grade of C or higher must be earned to receive credit for the CPA license. Note: Students cannot receive credit for both ACCT 4625 and ACCT 6025. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4780 - Accounting and Information Systems Processes and Controls

The course is designed to develop knowledge and skills used to understand and evaluate corporate accounting processes and systems. It focuses on financial and information system internal controls and the flow of corporate information through an accounting system. A financial system objective and risk assessment approach is used to present concepts and techniques for evaluating the adequacy of system processes and controls. Prereq: Completion of ACCT 2200, ACCT 2220 and ACCT 3054 with a grade of 'C' or better (strictly enforced). Cross-listed with ACCT 6510, ISMG 4780, and ISMG 6510. Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4800 - Accounting for Government and Nonprofit Organizations

Planning and control of government and nonprofit organizations. Includes program budgets, responsibility accounting and fund accounting. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3220 with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ACCT 6080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4840 - Independent Study

Restricted to undergraduate Business majors with junior standing or higher. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ACCT 4900 - Professional Certification in Accounting

This course will prepare students for the Uniform Certified Public Accountant Examination, including the Auditing and Attestation (AUD), Business Environment and Concepts (BEC), Financial Accounting and Reporting (FAR), and Regulation (REG) sections. Topical coverage will include a balance of most-tested topics, difficult topics, and exposure to topics not addressed in required accounting degree courses. Note: there will be a materials fee of \$1,100 for this course. All materials will continue to be available until successful passage of the CPA Exam. Note: Undergraduate Accounting students typically perform better in this class when taking it during the final semester prior to graduation. Restriction: Restricted to Undergraduate and MS Accounting students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4915 - Accounting for the Public Interest

Applies accounting knowledge and concepts in a not-for-profit organization. Student volunteers help with functions or special projects and are supervised by both faculty members and personnel from the agency to which they are assigned. Prereq: Permission of instructor. Cross-listed with ACCT 6015. Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 4950 - Special Topics

Research methods and results, special topics and professional developments in accounting. Consult the current 'Schedule Planner' for semester offerings. Prereq: Varies according to topic and instructor requirements. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ACCT 5939 - Internship

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ACCT 6015 - Accounting for the Public Interest

Applies accounting knowledge and concepts in a not-for-profit organization. Student volunteers help with functions or special projects and are supervised by both faculty members and personnel from the agency to which they are assigned. Note: This class is rarely offered. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Cross-listed with ACCT 4915. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6020 - Auditing Theory

Focus on the professional responsibilities of CPAs, generally accepted auditing standards, and PCAOB auditing standards, with emphasis on the theory underlying the development of standards, objectives and procedures. Students cannot receive credit for both ACCT 4620 & ACCT 6020. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3220 OR ACCT 6030 with a grade of C or higher. Restriction: Restricted to

graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Cross-listed with ACCT 4620. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6024 - Advanced Financial Accounting

Advanced financial accounting concepts and practice with emphasis on accounting for partnerships, business combinations and consolidations. Prereq: ACCT 3230 or 6030 with a grade of C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Cross-listed with ACCT 4240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6025 - Auditing Practice

Focus on the application of generally accepted auditing standards and PCAOB auditing standards to practice. Emphasis on procedures used by CPAs to gather and document audit evidence. Prereq: ACCT 6020 or ACCT 4620 with a grade of B or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Students cannot receive credit for both ACCT 4625 and ACCT 6025. Note: A grade of C or higher must be earned to receive credit for the CPA license. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6030 - Financial Accounting

Accelerated analysis of financial accounting concepts, the development of accounting thought and principles and critical review of generally accepted accounting principles. Note: A grade of C or higher must be earned to receive credit for the CPA license. Note: STUDENTS WHO HAVE TAKEN ACCT 3220 and ACCT 3230 (or equivalent) MAY NOT TAKE THIS COURSE. Student must take both ACCT 3220 AND 3230. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6033 - Advanced Managerial Accounting

Critical analysis of advanced topics in managerial accounting. Note: This class is rarely offered. Prereq: ACCT 3320. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6054 - Accounting Systems and Data Processing

The design and analysis of accounting information systems, with special emphasis on computers and computer programming, and the role of accounting in the management process. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: Completion of ACCT 2220 and ISMG 2050 with a grade of "C" or better (strictly enforced). Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Cross-listed with ACCT 4054 (previously ACCT 3054) Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6070 - Management Accounting

Designed to provide graduate business students with a foundation in management accounting models and information,

with emphasis on management decision making uses of accounting information. Note: A grade of C or higher must be earned to receive credit for the CPA license. Note: STUDENTS WHO HAVE TAKEN ACCT 3320 (or equivalent) MAY NOT TAKE THIS COURSE. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6080 - Accounting for Government and Nonprofit Organizations

Nonprofit Organizations. Planning and control of government and nonprofit organizations. Includes program budgets, responsibility accounting and fund accounting. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3220 or BUSN 6550 with a C or higher or permission of instructor. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Cross-listed with ACCT 4800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6140 - Tax Planning for Managers

A Federal tax survey course with an emphasis on tax planning for the graduate student who wants to understand the impact of taxation on individual and business transactions. Course materials emphasize the application of individual, partnership and corporate tax principles to the decision making process. Note: A grade of C or higher must be earned to receive credit for the CPA license. Note: Students cannot receive credit for both ACCT 4410 and 6140. Cross-listed with ACCT 4410. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6220 - Controllership: Financial Strategy and Controls

This course is designed to provide a comprehensive understanding of the wide ranging responsibilities of the Controller, including the timely and accurate preparation of the periodic financial statements, maintenance of an adequate records system, a comprehensive set of internal controls and budgets in order to manage and mitigate risk, how to enhance the accuracy of the company's reported financial results and ensure compliance with GAAP or IFRS. Topics also include techniques for cash forecasting, controlling and administering budgets, and developing effective long-range plans. Prereq: ACCT 6020 or UG equivalent ACCT 4620 and ACCT 6030 or UG equivalents ACCT 3220 and ACCT 3230 with a grade of C or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6225 - Controllership: Managerial Strategy and Benefits Analy

This course is designed to provide a comprehensive understanding of the wide ranging responsibilities of the Controller from a managerial and tax accounting perspective. Topics include establishing a cost accounting system, planning and control of manufacturing costs, business and strategic planning, mergers and acquisitions and a variety of tax related issues such as employment tax, employee vs. contractor, and choice of entity. The course will also include a discussion of benefits analysis, stock based compensation, ISO, NQSO and 83b elections. Prereq: ACCT 6220 with a grade of C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6230 - Advanced Topics in Mergers and Acquisitions

Mergers and acquisitions are often a key component of organizational strategy for growth and competitive advantage; yet empirical studies indicate many of these transactions fail to meet their intended objectives. This course prepares

accounting students as financial leaders to positively influence the achievement of planned synergies and acculturation for more successful M&A transactions. Integrating perspectives from accounting and organizational development, course topics include transaction valuation, contingent consideration, and asset impairment testing to organizational systems theory and post-transaction integration. Prereq: Grade of C (2.0) or higher in ACCT 6020 or ACCT 4620 and ACCT 6070. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6250 - Seminar: Financial Accounting

Nature and origin of accounting theory and the development of postulates, principles and practices. Methodology appropriate to development and evaluation of accounting theory, with special emphasis on accepted research standards and procedures. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3230 and ACCT 4620 or ACCT 6020 or concurrent registration in ACCT 4620 or ACCT 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6260 - Seminar: Managerial Accounting

Focuses on the conceptual foundations of managerial accounting. Behavioral and quantitative approaches regarding information for decision making, planning, control, performance evaluation and other issues are investigated. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 3320 or ACCT 6070 (or equivalent). Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6280 - Professional Judgment and Ethical Decisions in Accounting

Accounting is a process of providing economic information useful for decision making. This course provides (1) an opportunity to develop professional judgment skills, and (2) tools to make better decisions through an active, case-oriented learning method. Cases involve representative problems professional accountants face in financial reporting, audit, tax, business services, and practice management, including ethical conflicts and technical decisions. Participants learn to apply a structured decision model, incorporating critical, creative, evaluative and reflective judgment processes and learn how to recognize and avoid common decision errors and biases. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 4620 or ACCT 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6282 - Capitalism, Accounting and Ethical Choices

Examines the development of the U.S. economy from 1850 to today with emphasis on the ethics of accounting, capitalism, and government controls. Prereq: ACCT 2220 or BUSN 6550 (not strictly enforced). Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6285 - Accounting and Finance for Sustainability

Topics in accounting and finance related to business sustainability include the merits and challenges of a triple-bottom-

line perspective, mandatory and voluntary reporting, environmental liability measurement and disclosure, emissions trading, green investments, shareholder activism, microfinance, and socially responsible investing. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6290 - Management Control Systems

Focuses on the design and use of control systems which ensure that people in organizations behave consistently with the organizational goals. Controls for communication, motivation and performance evaluation (along with informational requirements) are stressed through analysis of cases and classroom discussion. Note: This class is rarely offered. Prereq: BUSN 6550 or equivalent. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6320 - White Collar and Financial Crimes

Course provides an opportunity to examine criminal activity perpetrated by individuals and/or organizations in a position of trust. White collar and financial crimes are qualitatively different from street crimes or violent crimes, yet they are highly destructive. Cover: types of crime, social impact, prevention, detection, regulating etc. Prereq: BUSN 6550 with a C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6330 - Fraud Auditing

This course provides an introduction to and guidance for creation of an effective fraud audit program in core business systems. The fraud audit is designed specifically to detect potential fraud and is vastly different than the traditional audit. Fraud auditing focuses on proven fraud methodology that allows auditors to discover fraud versus investigating it. The course: • Explains how to create a fraud audit program • Shows auditors how to locate fraud through the use of data mining • Focuses on proven methodology for detecting fraudulent transactions • Explores fraud discovery within specific corporate F&A functions, such as disbursement, procurement, payroll, revenue misstatement, inventory, journal entries, and management override. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6340 - Financial Statement Analysis

Financial statements are used as an information source on which to base investment, lending potential or even employment. Designed to develop skills in using, understanding, analyzing, and interpreting financial statements and to make students aware of the value and limitations of financial statement information. Note: Should take in the third semester of the graduate program. Prereq: BUSN 6550 or equivalent. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6350 - Current Issues in Professional Accounting

An in-depth analysis of current issues in the accounting profession, including ethics development, and validity of standards and regulations. Prereq: ACCT 3230, ACCT 4620, ACCT 6020 or permission of instructor. Restriction:

Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6360 - Fraud Examination

This course examines the theories and methods of the full spectrum of fraud examination including prevention, detection, investigation, and adjudication. In this course, students will explore the significant differences between fraud examination and auditing, going beyond detection into the investigative and adjudication process. Prereq: ACCT 4620 or ACCT 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6370 - International Accounting

Designed to expose students to the international aspects of accounting and financial management. Includes discussion of some of the different financial accounting practices across countries; financial statement analysis in a global context, international auditing practices and procedures, international tax implications and the implications of operating within the regulations of the Foreign Corrupt Practices Act, the European Union, North American Free Trade Agreement and General Agreement on Tariffs and Trade. Prereq: BUSN 6550 or equivalent. Note: Students cannot receive credit for both ACCT 6370 and INTB 6370. IFRS's are reviewed and compared with the requirements of US GAAP. Cross-listed with INTB 6370 and ACCT 4370. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6380 - Forensic Accounting

An examination of investigative auditing, fraud auditing, litigation support, and economic quantification of damages. Prereq: ACCT 4620 or ACCT 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6470 - Internal Auditing

Intro course for business students and CIA candidates. Topics include: IA fundamentals; IA standards; internal controls; managing the IA department; IA working papers, procedures and evidences; fraud detection and prevention; ethics; evaluation of the IA function, and Sarbanes-Oxley Act of 2002. Prereq: ACCT 4620 or ACCT 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6490 - Experiential Learning

Designed to provide practical knowledge on developing a professional practice in accounting or financial management. Topics: Marketing, operating a professional practice. Lectures, guest speakers (if you are interested in being a guest lecturer for the class contact the instructor), and student projects. Prereq: ACCT 3220 or permission of instructor. Cross-listed with ACCT 4490. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6510 - Accounting and Information Systems Processes and Controls

The course is designed to develop knowledge and skills used to understand and evaluate corporating accounting processes and systems. Focuses on financial and information system internal controls and the flow of corporate information through an accounting system. A financial system objective and risk assessment approach is used to present concepts and techniques for evaluating the adequacy of system processes and controls. Prereq: ACCT 4054 or ACCT 6054. Cross-listed with ACCT 4780, ISMG 4780 and 6510. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6520 - Issues in Oil and Gas Accounting

The Oil and Gas Accounting course is a course designed to give students an overview of the oil and gas industry and the particular accounting issues this industry faces. The focus is on the oil and gas industry but many of the issues discussed are appropriate and applicable to all energy-related entities. This is a valuable learning experience for those interested in acquiring an understanding of the accounting issues for energy management firms in preparation for entry into public accounting. The course enjoys support from the energy industry in the form of guest speakers and project ideas. Prereq: BUSN 6550 or ACCT 3220 or permission of instructor. Cross-listed with ACCT 4520. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6620 - Advanced Auditing

Development of auditing as a profession, including evolution of standards and audit reports. Historical and contemporary literature in the field reviewed. Note: A grade of C or higher must be earned to receive credit for the CPA license. Prereq: ACCT 6030 and ACCT 6020 with a C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6800 - Special Topics

Research methods and results, special topics and professional developments in accounting. Consult the current 'Schedule Planner' for semester offerings as new special topics courses are frequently added. Prereq: Varies according to topics and instructor requirements. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ACCT 6840 - Independent Study

Permission of instructor required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ACCT 6900 - Professional Certification in Accounting

This course will prepare students for the Uniform Certified Public Accountant Examination, including the Auditing and Attestation (AUD), Business Environment and Concepts (BEC), Financial Accounting and Reporting (FAR), and Regulation (REG) sections. Topical coverage will include a balance of most-tested topics, difficult topics, and exposure

to topics not addressed in required accounting degree courses. Note: there will be a materials fee of \$1,100 for this course. All materials will continue to be available until successful passage of the CPA Exam. Note: Undergraduate Accounting students typically perform better in this class when taking it during the final semester prior to graduation. Restriction: Restricted to Undergraduate and MS Accounting students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACCT 6939 - Internship/Cooperative Education

Supervised experiences involving the application of concepts and skills in an employment situation. Prereq: 15 semester hours for MS students and 21 hours for MBA students and a cumulative 3.2 GPA. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ACCT 6950 - Master's Thesis

Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ACPC 5110 - Group Counseling

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACPC 5400 - Career Development

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ACPC 5820 - Strategies in Agency Counseling

Max hours: 6 Credits. **Semester Hours:** 6 to 6

ANTH 1000 - Anthropology: Past and Present

Anthropology is the study of humankind in all of its diversity and complexity. Anthropologists have traditionally approached the study from four distinct perspectives: biological, cultural, linguistic and archaeological. This course considers how anthropologists study humankind from these four perspectives and the robust picture of humanity that emerges. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ANTH 1302 - Introduction to Archaeology

Introduces the study of past cultures and their environments. Emphasis is on the scientific method, aspects of research design and analytical techniques used by archaeologists to determine chronology, taphonomy, source production areas, exchange networks, and human-environment interactions. Note: Three hours of lecture and a two-hour lab each week. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3 **Semester Hours:** 4 to 4

ANTH 1303 - Introduction to Biological Anthropology

Introduces the study of human biological evolution, both processes and outcomes, from primate ancestors to fossil hominids to contemporary human populations. Methods of obtaining and interpreting data concerning the genetic, biological and evolutionary basis of physical variation in living and skeletal populations. Note: 3 hours of lecture and a 2 hour lab each week. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1 **Semester Hours:** 4 to 4

ANTH 2102 - Culture and the Human Experience

An application of the concept of culture to several aspects of the human experience, including gender relations, emotion and personality, cognition, language, health and healing and economic behavior. In exploring these dimensions of the human experience, the course focuses on selected cultures from each of the world's major geographic areas. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3 **Semester Hours:** 3 to 3

ANTH 2400 - Video and Social Change

Introduction to video production and analysis applied to social change. Focus on theories and practices of non-fiction image-making and "doing visual ethnography" to examine a range of experience and knowledge among different societies, communities, policy discourses and ourselves. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 2840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ANTH 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Sophomore standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ANTH 3000 - Globalization, Migration and Transnationalism

Examines the cultural dynamics of globalization, including: the development of special economic zones in the global south, rural to urban migration, transnational migration, the maintenance of transnational ties, and cross-border social formations. Reviews the dynamics of globalization through case studies and film. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3006 - Sustainable Development and Equity

Investigates theories, policies and discourses of development and equity and their relationship to health, socio-environmental problems. Considers the connections between green environmental knowledge and neoliberalism, the success and failures of development along public health, economic equality, social justice and ecological lines. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3008 - Contemporary World Problems: An Anthropological Perspective

This course examines contemporary problems confronting humanity from an anthropological perspective - a historical, holistic and comparative framework that will be used to critically assess these issues and identify forces driving them. Problems to be addressed include climate and environmental change, resource depletion, and poverty and inequality. Prereq: Junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3042 - Lost Worlds and Crystal Skulls

This class explores the differences between science and pseudoscience specifically within the realm of anthropology. Scientific method and critical thought are employed in a way that trains students to question and recognize the difference between fact and fiction in data. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3045 - Cannabis Culture

Familiarizes students with anthropological approaches to the culture of cannabis, including medicinal and recreational. Topics: history, cultural uses, legalization, cannabis capitalism, health effects, race and inequality, regulatory policies, retailing and consumption. Ethnographic research for data collection emphasized. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3101 - Foundations of Cultural Anthropology

Covers current theories in cultural anthropology and discusses the nature of field work. Major schools of thought and actual field studies are explored with an emphasis on anthropological data gathering, analysis and writing. Prereq: ANTH 2102. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3121 - Language, Culture, and Communication

Definitions of language and communication and their relationship to human behavior, thought and culture. The classification of languages, linguistic universals, language acquisition, multilingualism, and nonhuman communication, with consideration of the evolutionary implications of such studies. Prereq: ANTH 2102. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3142 - Cultural Diversity in the Modern World

An in-depth analysis of the phenomena of culture and application of the culture concept to understanding cultural

diversity in the modern world. Applies the concept of culture to several basic aspects of human social life, for example: social class and gender relations, ethnicity, racism and sexism, education, health and economic behavior. Students explore these issues in the context of case studies of particular groups and/or communities, focusing primarily on the diversity of cultural expression in contemporary U.S. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3150 - Special Topics in Medical Anthropology

Seminar series on current issues in medical anthropology. Faculty offer a range of different courses, including the political economy of drugs, health and human rights, and reproductive health. Prereq: ANTH 2102. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3200 - Human Migration: Nomads, Sojourners, and Settlers

Explores the relationship between human migration, voluntary and forced and social organization and culture in the modern world. Case studies include pastoralists, foragers, refugees, immigrants, sojourners and settlers and their impact on health, culture, identity, ethnicity, tradition and nationality. Cross-listed with PBHL 3200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3202 - Anthropology of Health Care Policy

Uses the tools and methods of cultural anthropology to analyze health care reform in the U.S. We examine analyses of the current health care system, debates over its reform, compare the US health care system to that of health care systems worldwide. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3210 - Urban Food Systems and Sustainability

Urbanites are increasingly removed from the complex of factors that provide us food. Being concerned about sustainability, we need to understand the complex webs in food systems and their implications for the health and natural systems. This problem-based course will wrestle with urban food systems organized to address the 3 E's of sustainability: environmental, economic, and equity. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3301 - World Prehistory

Explores of 3.5 million years of human cultural development that examines the prehistory of Africa, Asia, Europe and the Americas. Patterns and processes that underlie the earliest hominid expansion out of Africa, tool use, origins of fire, the peopling of the Americas, the development of metallurgy, the domestication of plants and animals and the rise of cities and the state are examined. Emphasis is on both regional developments and landmark projects that have helped clarify prehistory. Note: Introductory course in Archaeology (ANTH 1302) recommended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3310 - Colorado Archaeology

A survey of the prehistoric and protohistoric peoples of the five major culture areas of Colorado: the Four Corners, Great Basin, Rocky Mountains, High Plains, and Front Range. Of special interest will be the study of the initial

peopling of Colorado, economic and political organization, ethnic interaction and the history of archaeological work in the region. Prereq: ANTH 1302. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3315 - North American Archaeology

Course provides a survey of the prehistoric and historic archaeology of the United States, Canada and Northern Mexico. Current knowledge of the subject and current debates are discussed. Prereq: ANTH 1302. **Semester Hours:** 3 to 3

ANTH 3320 - Southwestern Archaeology

Considers the origins, characteristics, and interrelationships of the major culture areas in the American southwest, including the Anasazi, Hohokam, Mogollon, Sinagua and Northern Mexico. Note: ANTH 1302 recommended but not required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3330 - Topics in Archaeology

A flexible format for addressing specific topics in archaeology. Examples include the archaeology of the Great Plains, the Mediterranean Region, etc. Prereq: ANTH 2102. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ANTH 3410 - Anthropology of Work

Explores the culture of workforces and workplaces. Ethnographic methods and collaborative research practices comprise the framework of the course to examine people, occupations and work cultures engaged in production and consumption of commodities at local and global levels. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3420 - Anthropology and Politics of the Global Tobacco Epidemic

Examines anthropological perspectives on tobacco, tobacco-related health policymaking, and cigarette manufacturers and leaf-buying companies in the global tobacco epidemic. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3500 - Human Osteology

Provides in-depth knowledge of human osteology, including the following topics: skeletal anatomy; age, sex and stature determination; skeletal trauma/pathology; and taphonomy. Recitation component provides hands-on experience with skeletal material. Prereq: ANTH 1303. Max hours: 4 Credits. **Semester Hours:** 4 to 4

ANTH 3512 - Human Evolution

Provides an overview of the fossil and archaeological evidence for human origins. Theory and method in paleoanthropology is emphasized. The goal is to outline current knowledge of human biological evolution and the lifeways of our evolutionary relatives. Prereq: ANTH 1303. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3550 - Forensic Anthropology

Provides an introduction to methods used in forensic anthropology for investigating human remains in cases of medicolegal importance, including recovery, attribution of demographic characteristics, analysis of disease and trauma and determination of personal identity. Prereq: ANTH 1303. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3590 - Primate Behavior Research at the Zoo

Students will review information on primates, learn about data collection models, design a behavior observation project on captive primates, collect and analyze behavior data, write and present a formal scientific paper. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3666 - Anthropology of Death

The primary goal of the course is to identify and understand the range of human expression through the treatment of human remains in anthropological literature with focus on burials, mortuary practices, and associated rituals. Along with more theoretical papers, specific case studies will be used to address a variety of topics and issues, such as historic and prehistoric social organization, bio-archaeology, cannibalism, human sacrifice, mummification, the ethics of studying human remains, and the treatment of pets in prehistory. The time range that we will cover in the course will span from the Neolithic to the early 20th century, and numerous cultures from all parts of the globe will be our subject matter. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 3700 - Current Topics in Anthropology

This undergraduate course offers a flexible format for addressing specific topics of special interest in anthropology, such as: aging, race and prejudice, class, warfare and aggression, ethnicity, myth and folklore, language and communication, Colorado prehistory and topics in evolutionary theory. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ANTH 3910 - Cross-Cultural Field Experience

An intensive contact with another culture through supervised travel in the U.S. or in a country other than the United States. Written reports required. Note: Class includes pre-trip orientation lectures; in-country lectures by local resource people and supervising CU-Denver faculty. Max hours: 6 Credits. **Semester Hours:** 3 to 6

ANTH 3939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ANTH 4000 - Special Topics in Anthropology

Designed to give students a chance to evaluate critically some practical or theoretical problem under faculty

supervision and to present results of their thinking to fellow students and instructors for critical evaluation. Prereq: Junior standing or higher. Cross-listed with ANTH 5000. Max hours: 9 Credits. **Semester Hours:** 1 to 4

ANTH 4010 - Medical Anthropology: Global Health

This course is concerned with the underlying biological and cultural determinants of health throughout the human life cycle in global and cross-cultural perspective. Note: The first of a two-course sequence in medical anthropology and global health studies; the second is ANTH 4020. Prereq: Junior standing or higher. Cross-listed with ANTH 5014. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4030 - Ethnobiology

Considers the relationship between human society and plants and animals in the natural world. Primary focus on the perception and cognitive organization of the environment and how that affects the definition and use of plants and animals as resources. Prereq: Junior standing or higher. Cross-listed with ANTH 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4040 - Anthropology of Food and Nutrition

Examines the myriad relationships between food as a biological necessity and eating as a socially and culturally conditioned activity. Takes a biocultural perspective that considers not only the tremendous variety of foods we eat, but also the complex meanings and importance attached to food and eating. Prereq: Junior standing or higher. Cross-listed with ANTH 5040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4050 - Quantitative Methods in Anthropology

Surveys the ways of deriving meaning from anthropological data by numerical means, including, but not confined to basic statistical procedures. Prereq: Junior standing or higher. Cross-listed with ANTH 5053. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4060 - Evolutionary Medicine

Evolutionary medicine is a relatively new approach for understanding patterns of human health and disease. In this course, students will learn how human evolutionary history has shaped our susceptibility and resistance to both chronic and infectious diseases. Prereq: ANTH 1303. Cross-listed with ANTH 5060, HBSC 5060 and PBHL 4060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4070 - Culture of Development and Globalization

Anthropological critiques of development and globalization point out that they have occurred without regard for the diversity of human culture and human need. Beginning with this analysis, this course goes one step further by examining culture and values of development and how they affect the way development gets done. Note: students should consult with the instructor prior to enrolling in this course. Prereq: Junior standing or higher. Cross-listed with ANTH 5070. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4080 - Global Health Practice

A travel-study course that provides students the opportunity to work on global health issues in the context of a supervised internship experience. In addition to a formal internship placement or directed research opportunity, students attend formal lectures and participate in seminars devoted to addressing those health issues most relevant to the country in which the course is being taught. Prereq: Junior standing or higher. Cross-listed with ANTH 5080, HBSC 5080, PBHL 4080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4090 - Political Economy of Drugs

Psychotropic drugs, both legal and illicit, are a predominant part of our everyday lives. This course examines their use and meaning within cultures, and the social, political and economic issues that surround their production, use and misuse. Prereq: Junior standing or higher. Cross-listed with ANTH 5090, HBSC 5090, and PBHL 4090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4150 - Human Biocultural Adaptability

The chief concern of this course is the relationship between ourselves and our surroundings and the very immediate ways the environments in which we live affect us. The view is of ourselves as a part of, not apart from, these environments. Prereq: Junior standing or higher. Cross-listed with ANTH 5150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4170 - Culture and the Environment

Examines the historical origins of Western and non-Western ideas of the environment and the place of people within it. The imposition of Western ideas on non-Western groups regarding environmental policy is also examined, with special attention given to practices of conservation, development and transnational monetary policy. Prereq: Junior standing or higher. Cross-listed with ANTH 5170. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4180 - The Nature of Power

Introduces the major theories of power used in contemporary anthropology, with an emphasis on cross-cultural perspectives. Explores how power is defined, determined and exercised globally and locally and how different systems of power articulate with one another. Prereq: Junior standing or higher. Cross-listed with ANTH 5180. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4200 - Gender in Cross-Cultural Perspective

A comparative analysis of gender-based status and social roles of women and men, with women's status and roles emphasized due to their near-universal construction as the "Other" sex. Examines in cross- and sub-cultural context the relations among women's status and their subsistence and reproductive activities; and the division of labor by sex, ideology and political economy. Prereq: Junior standing or higher. Cross-listed with ANTH 5200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4230 - Anthropology and Community Based Participatory Research

The seminar explores anthropological critiques, knowledge production and multi-media approaches to community based participatory research (CBPR) such as photovoice and digital storytelling to understand the history of CBPR and analyze partnerships between university researchers and community representatives. Cross-listed with ANTH 5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4260 - Human Reproductive Ecology

Considers the determinants of fertility variation within and among traditional human societies. Biocultural and ecological perspectives on pubertal timing, marriage patterns, birth seasonality, duration of birth intervals and reproductive senescence. Prereq: Junior standing or higher. Cross-listed with ANTH 5260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4290 - Anthropology and Public Health

"This course critically explores anthropological approaches to public health problems. Through a number of key issues and case studies, we examine how public health practice can be enhanced through anthropological research, theory and methodology. Prereq: Junior standing or higher. Cross-listed with ANTH 5290. Max hours: 3 Credits." **Semester Hours:** 3 to 3

ANTH 4300 - Migrant Health

This course examines health issues associated with transnational migration from an anthropological point of view. Drawing upon case studies, we examine the health of migrant communities in both host and sending nations. Prereq: Junior standing or higher. Cross-listed with ANTH 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4320 - Archaeology of Mexico and Central America

Surveys the major prehistoric and protohistoric cultures and societies of that area of Mexico and Central America identified with the evolution of Meso-American civilization. Major topics include early human colonization of the Americas, the domestication of plants and animals, the emergence of regionally-based cultures and societies, trade and exchange and the evolution of urbanism and the state. Primary emphasis on such ancient cultures and societies as those of the Olmec, Zapotec, Maya, Teotihuacan, Toltec and Aztec. Prereq: Junior standing or higher. Cross-listed with ANTH 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4330 - Lithic Analysis

Examines the theoretical basis and methodological tools used by archaeologists in the analysis of prehistoric stone tools. Topics of discussion include the mechanics of stone fracture, typologies, use wear analysis and core reduction techniques. Prereq: Junior standing or higher. Cross-listed with ANTH 5330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4350 - Anthropology of Globalization

This course provides an overview of anthropological contributions to the study of globalization. Particular attention is devoted to: transformations in global capitalism, state and immigration policy, transnational families, health and transnationalism. Prereq: Junior standing or higher. Cross-listing ANTH 5350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4380 - Archaeology of Hunters-Gatherers

Explores the theory and methods used by archaeologists to investigate prehistoric hunter gatherers. Topics of concern include mobility, subsistence, procurement, and socio-political organization. Prereq: Junior standing or higher. Cross-listed with ANTH 5380. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4390 - Laboratory Methods in Archaeology

Methods and theories of archaeology are used to scrutinize the collection and interpretation of data and the relationships of archaeology to other disciplines. Core materials emphasize the critique of basic archaeological assumptions. Note: Course content varies slightly each time it is offered, in response to student needs and the availability of projects (e.g., laboratory work, urban excavation, survey and mapping). May be repeated for credit when topics change. Prereq: Junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4400 - Archaeology of Power and Inequality

Addresses inequality and power through a long-term archaeological and theoretical perspective. Discusses explanations for the origins of power and inequality and their role in early small-scale societies and emerging complex politics. Prereq: Junior standing or higher. Cross-listed with ANTH 5400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4450 - Development and Conservation: Contemporary Issues

Applies the theoretical paradigms of political ecology to contemporary issues of sustainable development. Case studies are chosen illustrating topics based on faculty expertise and student interaction. The first part of the course presents theoretical perspectives relevant to the chosen topic. In the second half, students participate in directed problem solving activities. Prereq: Junior standing or higher. Cross-listed with ANTH 5450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4460 - Development and Conservation: Theory and Practice

Examines the praxis of anthropological knowledge of human ecosystem interaction and development of economic opportunities. Issues of biodiversity, resource conservation, sustainable development and globalization are studied. Prereq: Junior standing or higher. Cross-listed with ANTH 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4500 - Advanced Issues in Human Evolution

This flexible course offers an advanced treatment of issues in human biological evolution. Topics may emphasize morphological evolution, behavioral evolution, the environment of human evolution, non-human primate comparative

information. Prereq: Junior standing or higher. Cross-listed with ANTH 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4550 - Primate Comparative Anatomy

Examines human and non-human primate anatomical diversity. Students learn primate anatomy and the morphological differences among species. Explanations for the evolutionary origins of differences are reviewed, focusing on evolutionary theory, comparative methods and biomechanics. Prereq: Junior standing or higher. Cross-listed with ANTH 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4560 - Human Ecology

Studies demographic and ecological variables as they relate to human populations. Aspects of natural selection, overpopulation and environmental deterioration are considered. Prereq: Junior standing or higher. Cross-listed with ANTH 5560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4570 - Landscape Archaeology

Introduces spatial archaeology through intrasite analysis and regional studies. Methods treated include site location and quantitative spatial organization. Theoretical topics include definitions of community, ancient urbanism and the impact of subsistence and politics on relations to the landscape. Prereq: Junior standing or higher. Cross-listed with ANTH 5570. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4580 - Neanderthals and the Origin of Modern Humans

Focuses on the human fossil record for the taxon *Homo sapiens*, including the earliest members of this group ("early" or "archaic" *Homo sapiens*), the Neanderthals and so-called "anatomically modern" *Homo sapiens*. The goal of the course is to survey the major issues within the area of modern human origins, and to learn about the evolutionary relationships, lifeways and behaviors of these groups. Prereq: Junior standing or higher. Cross-listed with ANTH 5580. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4590 - Primate Behavior

Studies nonhuman primate behavior with emphasis on understanding social behavior, ecology and issues related to human evolution. Prereq: Junior standing or higher. Cross-listed with ANTH 5590. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4600 - Medical Anthropology

Introduces students to the theories and concepts of medical anthropology, the study of human health and illness. Explores conceptions of the body, modalities of healing, the clinical encounter, and new medical technologies. Prereq: Junior standing or higher. Cross-listed with ANTH 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4640 - Darwinian Approach to Human Behavior

The evolution of human behaviors from a Darwinian perspective, focusing on the natural selection of behaviors that maximize reproductive success. Includes topics such as male and female reproductive strategies, female mate choice, male violence and resource acquisition and control. Prereq: Junior standing or higher. Cross-listed with ANTH 5640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4800 - Special Topics in Medical Anthropology

Seminar series on current issues in medical anthropology. Faculty offer a range of different courses, including the political economy of drugs, health and human rights, and reproductive health. Prereq: Junior standing or higher. Cross-listed with ANTH 5800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4810 - Integrating Anthropology

Designed to build on specialized course work in the subdisciplines of anthropology, this course emphasizes the basic concepts that integrate and unite the discipline and give it unique perspective. These are the concepts of culture, adaptation and human evolution. In the last several weeks of the course, students consider the applicability of the anthropological perspective to specific human issues. Note: Centers on the critical examination and discussion of presentations made by department faculty and graduate students. Note: this course assumes that students have completed course work equivalent to a minor in anthropology. Prereq: Junior standing or higher. Cross-listed with ANTH 5810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 4840 - Independent Study

Directed study based on a specific subfield of anthropology. Note: Permission of instructor required. Max hours: 12 Credits. **Semester Hours:** 1 to 3

ANTH 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ANTH 4910 - Field Experience in Archaeology

Students participate in archaeological field research and data recovery and conduct laboratory analysis of materials recovered in the field. Emphasis is placed on excavation technique and accuracy of record keeping. Prereq: Junior standing or higher. Cross-listed with ANTH 5910. Max hours: 9 Credits. **Semester Hours:** 3 to 6

ANTH 4995 - Travel Study

A flexible format that permits courses to be taught in various areas of the world. Cultures of the Himalayas. Concerned broadly with contemporary Himalayan culture. Focuses on Tibetan cultures and the Tibetan diaspora, and the Nepalese (Newari) culture of the Katmandu Valley. The goals for this course are: to acquaint the student with social, political and cultural features of this part of the world; to teach, through directed field experiences, how cultural anthropology is

practiced; to understand how the process of tourism differs from the study of anthropology; how tourism, however it is practiced, changes in fundamental ways those subject to it. The Arts of Self and Society in Contemporary China. An intensive introduction to contemporary conditions and issues in the People's Republic of China, including social relations, popular culture, eating practices, religious practices and everyday life. Uses a combination of readings, lectures, field trips to local sites and ethnographic film. Max hours: 12 Credits. **Semester Hours:** 3 to 9

ANTH 5000 - Special Topics in Anthropology

Designed to give students a chance to evaluate critically some practical or theoretical problem under faculty supervision and to present results of their thinking to fellow students and instructors for critical evaluation. Prereq: Permission of instructor. Restriction: Restricted to Anthropology graduate students. Cross-listed with ANTH 4000. Max hours: 9 Credits. **Semester Hours:** 1 to 6

ANTH 5014 - Medical Anthropology: Global Health

This course is concerned with the underlying biological and cultural determinants of health throughout the human life cycle in global and cross-cultural perspective. Note: The first of a two-course sequence in medical anthropology and global health studies; the second is ANTH 5024. Prereq: Graduate standing. Cross-listed with ANTH 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5030 - Ethnobiology

Considers the relationship between human society and plants and animals in the natural world. Primary focus on the perception and cognitive organization of the environment and how that affects the definition and use of plants and animals as resources. Note: this course assumes that students have completed introductory coursework in anthropology and/or biology. Prereq: Graduate standing. Cross-listed with ANTH 4030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5040 - Anthropology of Food and Nutrition

Examines the myriad relationships between food as a biological necessity and eating as a socially and culturally conditioned activity. Takes a biocultural perspective that considers not only the tremendous variety of foods we eat, but also the complex meanings and importance attached to food and eating. Note: this course assumes that students have completed an introductory course in anthropology. Prereq: Graduate standing. Cross-listed with ANTH 4040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5053 - Quantitative Methods in Anthropology

Surveys the ways of deriving meaning from anthropological data by numerical means, including, but not confined to basic statistical procedure. Note: this course assumes that students have completed a college-level algebra course. Prereq: Graduate standing. Cross-listed with ANTH 4050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5060 - Evolutionary Medicine

Evolutionary medicine is a relatively new approach for understanding patterns of human health and disease. In this

course, students will learn how human evolutionary history has shaped our susceptibility and resistance to both chronic and infectious diseases. Note: this course assumes that students have completed ANTH 1303 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4060, HBSC 5060 and PBHL 4060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5070 - Culture of Development and Globalization

Anthropological critiques of development and globalization point out that they have occurred without regard for the diversity of human culture and human need. Beginning with this analysis, this course goes one step further by examining culture and values of development and how they affect the way development gets done. Note: students should consult with the instructor prior to enrolling in this course. Prereq: Graduate standing. Cross-listed with ANTH 4070. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5080 - Global Health Practice

A travel-study course that provides students the opportunity to work on global health issues in the context of a supervised internship experience. In addition to a formal internship placement or directed research opportunity, students attend formal lectures and participate in seminars devoted to addressing those health issues most relevant to the country in which the course is being taught. Note: this course assumes that students have completed HBSC/ANTH 4010/5014, HBSC/ANTH 4020/5024, HLTH 6070 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4080, HBSC 5080 and PBHL 4080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5090 - Political Economy of Drugs

Psychotropic drugs, both legal and illicit, are a predominant part of our everyday lives. This course examines their use and meaning within cultures, and the social, political and economic issues that surround their production, use and misuse. Note: this course assumes that students have completed an introductory course in cultural anthropology. Prereq: Graduate standing. Cross-listed with ANTH 4090, HBSC 5090, and PBHL 4090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5150 - Human Biocultural Adaptability

The chief concern of this course is the relationship between ourselves and our surroundings and the very immediate ways the environments in which we live affect US. The view is of ourselves as a part of, not apart from, these environments. Note: this course assumes that students have a background in cultural anthropology. Prereq: Graduate standing. Cross-listed with ANTH 4150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5170 - Culture and the Environment

Examines the historical origins of Western and non-Western ideas of the environment and the place of people within it. The imposition of Western ideas on non-Western groups regarding environmental policy is also examined, with special attention given to practices of conservation, development and transnational monetary policy. Note: this course assumes that students have completed ANTH 2102 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4170. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5180 - The Nature of Power

Introduces the major theories of power used in contemporary anthropology, with an emphasis on cross-cultural perspectives. Explores how power is defined, determined and exercised globally and locally and how different systems of power articulate with one another. Note: this course assumes that students have completed ANTH 2102 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4180. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5200 - Gender in Cross-Cultural Perspective

A comparative analysis of gender-based status and social roles of women and men, with women's status and roles emphasized due to their near-universal construction as the "other" sex. Examines, in cross- and sub-cultural context, the relations among women's status and their subsistence and reproductive activities; and the division of labor by sex, ideology and political economy. Prereq: Graduate standing. Cross-listed with ANTH 4200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5230 - Anthropology and Community Based Participatory Research

The seminar explores anthropological critiques, knowledge production and multi-media approaches to community based participatory research (CBPR) such as photovoice and digital storytelling to understand the history of CBPR and analyze partnerships between university researchers and community representatives. Prereq: Graduate standing. Cross-listed with ANTH 4230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5260 - Human Reproductive Ecology

Considers the determinants of fertility variation within and among traditional human societies. Biocultural and ecological perspectives on pubertal timing, marriage patterns, birth seasonality, duration of birth intervals and reproductive senescence. Note: this course assumes that students have completed ANTH 1303 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5290 - Anthropology and Public Health

"This course critically explores anthropological approaches to public health problems. Through a number of key issues and case studies, we examine how public health practice can be enhanced through anthropological research, theory and methodology. Prereq: graduate standing. Cross-listed with ANTH 4290. Max hours: 3 Credits." **Semester Hours:** 3 to 3

ANTH 5300 - Migrant Health

This course examines health issues associated with transnational migration from an anthropological point of view. Drawing upon case studies, we examine the health of migrant communities in both host and sending nations. Prereq: graduate standing. Cross-listed with ANTH 4300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5320 - Archaeology of Mexico and Central America

Surveys the major prehistoric and protohistoric cultures and societies of that area of Mexico and Central America identified with the evolution of Meso-American civilization. Major topics include early human colonization of the

Americas, the domestication of plants and animals, the emergence of regionally-based cultures and societies, trade and exchange and the evolution of urbanism and the state. Primary emphasis on such ancient cultures and societies as those of the Olmec, Zapotec, Maya, Teotihuacan, Toltec and Aztec. Note: this course assumes that students have completed an introductory archaeology course. Prereq: Graduate standing. Cross-listed with ANTH 4320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5330 - Lithic Analysis

Examines the theoretical basis and methodological tools used by archaeologists in the analysis of prehistoric stone tools. Topics of discussion include the mechanics of stone fracture, typologies, use wear analysis and core reduction techniques. Note: this course assumes that students have completed ANTH 1302 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5350 - Anthropology of Globalization

This course provides an overview of anthropological contributions to the study of globalization. Particular attention is devoted to: transformations in global capitalism, state and immigration policy, transnational families, health and transnationalism. Note: previous coursework in anthropology is strongly recommended for success in this course. Prereq: Graduate standing. Cross-listing ANTH 4350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5380 - Archaeology of Hunters-Gatherers

Explores the theory and methods used by archaeologists to investigate prehistoric hunter gatherers. Topics of concern include mobility, subsistence, procurement, and socio-political organization. Note: this course assumes that students have completed ANTH 1302 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4380. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5400 - Archaeology of Power and Inequality

Addresses inequality and power through a long-term archaeological and theoretical perspective. Discusses explanations for the origins of power and inequality and their role in early small-scale societies and emerging complex politics. Note: this course assumes that students have completed ANTH 1302 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5450 - Development and Conservation: Contemporary Issues

Applies the theoretical paradigms of political ecology to contemporary issues of sustainable development. Case studies are chosen illustrating topics based on faculty expertise and student interaction. The first part of the course presents theoretical perspectives relevant to the chosen topic. In the second half, students participate in directed problem solving activities. Note: this course assumes that students have completed ANTH 4070 and 4170 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5460 - Development and Conservation: Theory and Practice

Examines the praxis of anthropological knowledge of human ecosystem interaction and development of economic

opportunities. Issues of biodiversity, resource conservation, sustainable development and globalization are studied. Note: this course assumes that students have completed ANTH 5450. Prereq: Graduate standing. Cross-listed with ANTH 4460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5500 - Advanced Issues in Human Evolution

This flexible course offers an advanced treatment of issues in human biological evolution. Topics may emphasize morphological evolution, behavioral evolution, the environment of human evolution, non-human primate comparative information. Prereq: Graduate standing. Cross-listed with ANTH 4500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5530 - Anthropological Genetics

An advanced survey of molecular and population genetics and their applications in anthropology. Topics vary, including but not limited to: genetic epidemiology, genetic distance studies, behavioral genetics, developmental genetics, sociobiology, and use of mitochondrial DNA to reconstruct population histories. Emphasis is on applications of new technology and methodology, as well as new genetic paradigms replacing classical models of genetic causation. Note: this course assumes that students have completed undergraduate coursework in biological anthropology or genetics. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5550 - Primate Comparative Anatomy

Examines human and non-human primate anatomical diversity. Students learn primate anatomy and the morphological differences among species. Explanations for the evolutionary origins of differences are reviewed, focusing on evolutionary theory, comparative methods and biomechanics. Note: this course assumes that students have completed ANTH 1303 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5560 - Human Ecology

Studies demographic and ecological variables as they relate to human populations. Aspects of natural selection, overpopulation and environmental deterioration are considered. Note: this course assumes that students have a background in biological or physical anthropology. Prereq: Graduate standing. Cross-listed with ANTH 4560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5570 - Landscape Archaeology

Introduces spatial archaeology through intrasite analysis and regional studies. Methods treated include site location and quantitative spatial organization. Theoretical topics include definitions of community, ancient urbanism and the impact of subsistence and politics on relations to the landscape. Note: this course assumes that students have completed ANTH 1302 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4570. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5580 - Neanderthals and the Origin of Modern Humans

Focuses on the human fossil record for the taxon *Homo sapiens*, including the earliest members of this group ("early"

or "Archaic" Homo sapiens), the Neanderthals and so-called "Anatomically modern" Homosapiens. The goal of the course is to survey the major issues within the area of modern human origins, and to learn about the evolutionary relationships, lifeways and behaviors of these groups. Note: this course assumes that students have completed ANTH 1303 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4580. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5590 - Primate Behavior

Studies nonhuman primate behavior with emphasis on understanding social behavior, ecology and issues related to human evolution. Note: this course assumes that students have completed ANTH 1303 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4590. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5600 - Medical Anthropology

Introduces students to the theories and concepts of medical anthropology, the study of human health and illness. Explores conceptions of the body, modalities of healing, the clinical encounter, and new medical technologies. Prereq: Graduate standing. Cross-listed with ANTH 4600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5640 - Darwinian Approach to Human Behavior

The evolution of human behaviors from a Darwinian perspective, focusing on the natural selection of behaviors that maximize reproductive success. Includes topics such as male and female reproductive strategies, female mate choice, male violence and resource acquisition and control. Note: this course assumes that students have completed ANTH 1303 or equivalent. Prereq: Graduate standing. Cross-listed with ANTH 4640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5800 - Special Topics in Medical Anthropology

Seminar series on current issues in medical anthropology. Faculty offer a range of different courses, including the political economy of drugs, health and human rights, and reproductive health. Prereq: graduate standing. Cross-listed with ANTH 4800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5810 - Integrating Anthropology

Designed to build on specialized course work in the subdisciplines of anthropology, this course emphasizes the basic concepts that integrate and unite the discipline and give it unique perspective. These are the concepts of culture, adaptation and human evolution. In the last several weeks of the course, students consider the applicability of the anthropological perspective to specific human issues. Note: Centers on the critical examination and discussion of presentations made by department faculty and graduate students. Restriction: Restricted to Anthropology graduate students. Cross-listed with ANTH 4810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 5840 - Independent Study

Directed study based on a specific subfield of anthropology. Prereq: Permission of instructor required. Max hours: 12 Credits. **Semester Hours:** 1 to 6

ANTH 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ANTH 5910 - Field Experience in Archaeology

Students participate in archaeological field research and data recovery and conduct laboratory analysis of materials recovered in the field. Emphasis is placed on excavation technique and accuracy of record keeping. Note: this course assumes that students have a background in archaeology. Prereq: Graduate standing. Cross-listed with ANTH 4910. Max hours: 9 Credits. **Semester Hours:** 3 to 6

ANTH 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

ANTH 5995 - Travel Study

A flexible format that permits courses to be taught in various areas of the world. Cultures of the Himalayas. Concerned broadly with contemporary Himalayan culture. Focuses on Tibetan cultures and the Tibetan diaspora, and the Nepalese (Newari) culture of the Katmandu Valley. The goals for this course are: to acquaint the student with social, political and cultural features of this part of the world; to teach, through directed field experiences, how cultural anthropology is practiced; to understand how the process of tourism differs from the study of anthropology; how tourism, however it is practiced, changes in fundamental ways those subject to it. The Arts of Self and Society in Contemporary China. An intensive introduction to contemporary conditions and issues in the People's Republic of China, including social relations, popular culture, eating practices, religious practices and everyday life. Uses a combination of readings, lectures, field trips to local sites and ethnographic film. Max hours: 9 Credits. **Semester Hours:** 3 to 9

ANTH 6000 - Seminar in Current Research Topics

An inquiry into current research of critical and general interest to anthropologists. Variable format. Note: students should receive permission from the instructor prior to registering for this course. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 1 to 3

ANTH 6040 - Advanced Topics in Medical Anthropology

A flexible seminar format for dealing with topics of special interest in medical anthropology on an advanced graduate level. Topics to be considered vary from semester to semester. Examples include high altitude adaptation, anthropological perspectives on substance abuse, epidemiology, environmental and occupational health, the health consequences of cultural change and cross-cultural psychiatry. Note: Topics vary from semester to semester. Note: students should receive permission from the instructor prior to registering for this course. Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 1 to 4

ANTH 6041 - Human Genetics: Legal, Ethical and Social Issues

Examines legal, ethical and social issues that have come about with advances in human genetics. Topics include privacy, informed consent, discrimination, forensics, medical malpractice and property rights. Prereq: Graduate standing. Cross-listed with HBSC 6320 and 7320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6063 - Qualitative Research Design and Methods

Much of the data collected in the social sciences is interview and text-based. This course explores methods for collecting and analyzing these data and theoretical paradigms that underlie these methods. Restriction: Restricted to Anthropology graduate students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6103 - Current Theory in Ethnography

An in-depth inquiry into important theories in cultural anthropology through extensive primary source reading. Practice in formulating theory, critical thinking and theoretical writing are emphasized. Note: First course in a two-course required graduate sequence. Note: this course assumes that students have completed undergraduate coursework in cultural anthropology. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6133 - Anthropological Perspectives on Language

An intensive introduction to linguistic anthropology. Following a brief survey of technical linguistics, focus is on: the roles of language in society; multilingualism; language and identity; language and worldview; language, gender, class and power; language as social action; and other topics. Students carry out investigations based on models from their reading, as well as responding to the theoretical approaches of the field. Note: this course assumes that students have completed undergraduate coursework in cultural anthropology. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6307 - Contemporary Perspectives in Archaeology

Explores contemporary theoretical methodological perspectives in archaeology. Structured to proceed from a survey of the history of archaeological thought based on recent retrospectives, to an analysis of works reflecting current perspectives and directions. Topics include: archaeological interpretation, classical versus scientific archaeology, versus culture-history, functionalist and materialist paradigms, ethno-archaeological and text-based studies, neo-evolutionism, interactionist models, Marxist perspectives, processual theory. Note: this course assumes that students have completed undergraduate coursework in archaeology. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6317 - Archaeological Research Design and Analysis

Examines the methods and techniques used in archaeology, including theory-building, hypothesis testing and middle range theory. Core materials emphasize the learning and critique of basic archaeological assumptions and the methods and theories used to scrutinize the collection and interpretation of data. Topics include chronometric applications and paleo-environmental reconstruction. Note: this course assumes that students have completed ANTH 6307 or equivalent. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6503 - Biological Anthropology Core: The Fossil Record

Examines the historical development and modern practice of biological anthropology, including the theoretical and methodological foundations of this field. Emphasis is placed on the evidence for human and non-human primate evolution and the processes that influenced this evolution. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6513 - Biological Anthropology Core: Modern Human Variation

Considers the theory and methods used in investigations of biological variation in contemporary human populations. This includes the biological and cultural sources responsible for creating and maintaining contemporary variation as well as their functional consequences. Methods of research design and how to write a grant and scientific articles are considered. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ANTH 6520 - Seminar: Selected Topics in Physical Anthropology

A flexible seminar format for dealing with topics of special interest in physical anthropology on an advanced graduate level. Topics vary from semester to semester. Examples include: anthropology of nutrition, paleoecology, primate evolution, field experience in paleontology, advanced osteology and advanced human ecology. Note: This course assumes that students have completed undergraduate work in biological/physical anthropology. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ANTH 6840 - Independent Study: Anth

Max hours: 12 Credits. **Semester Hours:** 1 to 3

ANTH 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

ARAB 1010 - Beginning Arabic I

Beginning course in Modern Standard Arabic (MSA) designed for students who have not had any experience with the language. Max hours: 5 Credits. **Semester Hours:** 5 to 5

ARAB 1020 - Beginning Arabic II

Beginning course in Modern Standard Arabic (MSA) designed for students who have not had any experience with the language. Note: This course assumes that students have passed ARAB 1010 or equivalent, or have taken one year of high school Arabic, or possess equivalent proficiency. A grade of C- or higher in ARAB 1010 is recommended for success in this course. This course is not intended for native speakers. Max hours: 5 Credits. **Semester Hours:** 5 to 5

ARAB 2110 - Intermediate Arabic I

Third-semester course in Modern Standard Arabic (MSA) designed for students who have had two semesters or comparable proficiency in the language. Note: This course assumes that students have passed ARAB 1020 or equivalent, or have taken two years of high school Arabic, or possess equivalent proficiency. A grade of C- or higher in ARAB 1020 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARAB 2120 - Intermediate Arabic II

Fourth-semester course in Modern Standard Arabic (MSA) designed for students who have had three semesters or comparable proficiency in the language. Note: This course assumes that students have passed ARAB 2110 or equivalent, or have taken three years of high school Arabic, or possess equivalent proficiency. A grade of C- or higher in ARAB 2110 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARAB 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ARAB 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ARCH 1110 - Introduction to Architecture

Introduces students to the essential ways of looking at and thinking about buildings, sites and cities, exposing students to the various perspectives, positions and practices that they will encounter in both an architecture curriculum and in architectural practice. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 2110 - Design Studio I

Introduces students to the principles of design and composition through studies of architecture's formal, spatial, and geometric systems. Students explore these using a variety of drawing techniques including diagramming and drawings that are exploratory, analytical and developmental. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 2230 - Architectural History I

Introduces architecture and urbanism from prehistory to the mid-seventeenth century by exploring the social, cultural, technical, philosophical and aesthetic ideas that shaped buildings and other architectural and urban settings in different parts of the world. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3110 - Design Studio II

Introduces students to the expressive potential of architecture's elements and systems. Students explore techniques for translating and expressing ideas in buildings through the static, dynamic and sequential manipulation of architectural form and space. Prereq: ARCH 2110. Restriction: Must be an undergraduate Architecture student. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 3120 - Design Studio III

Focuses on the design of buildings in their relationship to physical, natural and cultural contexts. Students explore non-formal concepts and translate them into architectural experiences that integrate program, site and climate. Prereq: ARCH 3110. Restriction: Must be an undergraduate Architecture student. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 3130 - Construction Practices I

Provides an overview of the materials, systems, assemblies and processes that inform the design and construction of buildings, reviewing the building technologies and developing student understandings of the interrelationship between the interconnected elements and systems that define buildings and spaces. Prereq: PHYS 2010/2030 and MATH 1130 are recommended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3230 - Architectural History II

Introduces architecture and urbanism from the mid-seventeenth century to the present, exploring the forces that shaped buildings and other architectural and urban settings in different parts of the world. Prereq: ARCH 2230. Restriction: Must be an undergraduate Architecture student. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3330 - Building Systems I

Introduces the concepts and methods of environmental control in residential buildings. Discusses the thermal behavior of buildings, climate as a determinant of building design, energy use in buildings, natural and mechanical means of environmental control, plumbing, electrical, communication systems, water supply and sanitation systems. Prereq: MATH 1130 or MATH 1110 and 1120 (must earn a C- or better in these MATH courses). Prereq or Coreq: PHYS 2010 and 2030. Restriction: Restricted to undergraduate ARCH students within the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3340 - Theory of Structures I

Introduction to the analysis and design of structural elements and focuses on the principles of statics and the strength of materials. Topics include stress determination, deflection and the behaviors of tension, compression and shear in various structural elements. Prereq: MATH 1130 or MATH 1110 and 1120. Coreq: PHYS 2010 and 2030. Restriction: Restricted to undergraduate ARCH students within the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3430 - Construction Practices II

Discusses the principles and processes of building construction and introduces the major systems and assemblies that inform construction practices. Stresses the relationship between architectural concepts and emerging building technologies, teaching students how to select appropriate materials, systems and assemblies. Prereq: ARCH 3130. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3600 - Special Topics Cultural

Special topics in architecture studies related to cultural inquiries including theory, cultural diversity, and/or cross cultural thinking. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ARCH 3601 - History of American Architecture

This course investigates the history of architecture in the United States as a chronological survey of buildings, architects, landscapes, and urban forms and as an exploration of the social, political, economic, technological, and similar issues that inform this built environment. Restriction: Must be an undergraduate Architecture student with sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3602 - Architecture Photography

Architecture elective in photography of space, interior, and exterior with an emphasis on design composition of architecture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3603 - Modern Architecture

Examination of that period in architecture called the Modern Movement, its proponents and its influence on the design of buildings today. Extensive readings and writings required. Prereq: ARCH 2230. Restriction: Restricted to Sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3690 - Cultural Research Abroad

Topics in architecture studies related to cultural inquiries including theory, cultural diversity, and/or cross cultural thinking in other cultures. Work shall include preparation in culture, history and language skills in other countries. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ARCH 3691 - Cultural Design Abroad

Design topics in architecture studies related to cultural inquiries including design, cultural implications of design, and/or cross cultural application of design. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ARCH 3700 - Special Topics Design

Special topics in architecture studies related to design inquiries including theory, design skills, and/or analytical thinking. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ARCH 3701 - Survival Sketching

The focus of this course will be the sketchbook and the keeping of a sketchbook. Restriction: Must be an undergraduate Architecture student with sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3702 - Design Thinking

Students will be introduced to tools that will enable them to reframe design dilemmas in favor of productive resolutions. Course content will include examples and specific techniques of design thinking, including empathy, abductive reasoning, testing, plussing and diagramming. Prereq: sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3800 - Special Topics - Technical

Special topics elective will include coursework in either Digital Media In Design courses, Design-Build site Construction, or the Science and Art of Engineering Buildings. Additional topics will be develop in conjunction with the required undergraduate technical electives. Restriction: Must be an undergraduate Architecture student with sophomore standing or higher. Max hours: 12 Credits. **Semester Hours:** 3 to 3

ARCH 3801 - Arch. Digital Media I

Introduces Building Information Modeling (BIM) systems as a means to integrate and optimize design processes and building systems in the professional practice of architecture. Topics include creation of simulated, complex, three-dimensional environments in support of the architectural design studio sequence. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3802 - Arch Project Presentation

Architecture elective in digital and analog methods of presentation and composition for various audiences and formats. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3804 - Green Tech I

Green Tech I is the first of two courses that are a "real build" course in which students advance their knowledge of environmental design through full-scale construction of architectural elements, furnishings, accessories, finishes, outdoor gear, or even clothing. Restriction: Restricted to ARCH-BS majors with sophomore standing. Coreq: ARCH 3806. Cross-listed with ARCH 6375. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3805 - Beginning Revit

Introduction to Building Information Modeling through Autodesk's Revit Architecture software. The course explores fundamental architectural concepts as they are developed and expressed in Revit. Appropriate program use and team learning experiences are emphasized. Prereq: ARCH 3110 and 3130. Restriction: Restricted to ARCH-BS majors with sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3806 - Green Tech II

Green Tech II is the second of two courses that are a "real build" course in which students advance their knowledge of environmental design through full-scale construction of architectural elements, furnishings, accessories, finishes, outdoor gear, or even clothing. Restriction: Restricted to ARCH-BS majors with sophomore standing. Coreq: ARCH 3804. Cross-listed with ARCH 6376. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 3949 - Internship I

Experiential learning student internships sponsored by faculty in a field related to architecture. Minimum of 45 work hours per credit. Prereq: Permission of instructor, advisor and acceptance in BS Architecture program. Must also have sophomore standing. Minimum 15 credit hours with 2.75 GPA. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ARCH 4110 - Design Studio IV

Design Studio IV. Introduces students to analysis and design as complementary processes. Students learn how to form design intentions based on analytical research and close study of the relationship between architecture, precedent and culture, and to consider buildings as settings that address issues of culture, society, economy and ecol. Prereq: ARCH 3120. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 4120 - Design Studio V

Explores the place and role of architecture as an instrument of critical social engagement and cultural change, the role of history and precedent in the design process, and the role of detail through projects that demonstrate student's proficiency as designers. Prereq: ARCH 4110. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 4340 - Theory of Structures II

Focuses on the relationship between architectural concepts and the selection of structural systems. Addresses the qualitative and quantitative analysis of reinforced concrete, steel, and wood structural systems and members. Prereq: ARCH 3340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 4440 - Building Systems II

Focuses on the environmental systems in commercial and other nonresidential buildings. Discusses natural and artificial lighting, HVAC systems, acoustics, vertical transportation and fire protection. Prereq: ARCH 3330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 4840 - Independent Study

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to architecture. Prereq: Restricted to undergraduate ARCH students within the College of Architecture and Planning with sophomore standing or higher. Max hours: 6 Credits. **Semester Hours:** 1 to 3

ARCH 4949 - Internship II

Experiential learning student internships sponsored by faculty in a field related to architecture. Minimum of 45 work hours per credit. Permission of instructor, advisor and acceptance in BS Architecture program. Must also have sophomore standing. Minimum 15 credit hours with 2.75 GPA. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ARCH 5000 - Math and Physics for Architects

Provides the review of mathematics and physics. This is a prerequisite for the graduate technology courses. Does not count toward the required credits for the MARCH degree. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5110 - Design Studio I

The first of two elemental design studios focused on on the language of design, organizational and spatial systems and principles as well as on analog and digital methods of visualizing architectural ideas and forms. Prereq: Must have completed the College's woodshop training program. Coreq: ARCH 5510. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 5120 - Design Studio II

The second of two elemental design studios focused on translating organizational and spatial systems, principles and concepts into architectural systems. Through a number of small scaled design exercises students learn how organizational and spatial systems can be leveraged in the design of their buildings. Prereq: ARCH 5110 and ARCH 5510. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 5130 - Design Studio III

The first of the two analytical design studios addresses how design ideas are formed through the analysis of the program in terms of action and perception and how to transform those ideas into formal strategies and specific architectural experiences. Prereq: ARCH 5120. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 5140 - Design Studio IV

The second of the two analytical studios will build upon ideas developed in the previous studio concerning how the analysis of the program in terms of action and perception inform the formal strategies and the design of specific architectural experiences. Prereq: ARCH 5130. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 5210 - Introduction to Architecture

Introduces important ways of looking at architecture and acquaints students with the various perspectives that they will later find in the rest of the curriculum. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5220 - History and Theory Architecture I

Introduces world architecture and urbanism from prehistory to the Italian Renaissance. The course helps students understand the various cultural, technological, philosophical, and aesthetic ideas that helped shape buildings through history. Buildings and settlements on all continents and in all of the major world cultures are discussed. Prereq: ARCH 5210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5230 - History and Theory Architecture II

Examines world architecture and urbanism from the Italian Renaissance to the present. Helps students understand the various cultural, technological, philosophical and aesthetic ideas that helped shape buildings through history. Buildings and settlements on all continents and in all of the major world cultures are discussed. Prereq: ARCH 5220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5310 - Building Construction I

The first of a two-course sequence that provides an overview of the structure, systems, assemblies and processes that make a building. Provides a broad view of building technology and an understanding of the interrelationship of all the parts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5330 - Sustainable Systems I

The first course in the sustainable systems sequence introduces concepts and design methods of energy-efficient environmental control in buildings including thermal and moisture loads, heating, ventilation and air conditioning equipment and systems, and active and passive thermal strategies. Prereq: ARCH 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5340 - Sustainable Systems II

The second course in the sustainable systems sequence introduces concepts and design methods of plumbing, power distribution, renewable electricity, artificial illumination, daylighting, acoustics, vertical transportation, fire protection, and telecommunication systems in buildings with a focus on energy and resource efficiency. Prereq: ARCH 5330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5350 - Structures I

The first course in the structures sequence introduces the analysis and design of structural elements and focuses on the principles of statics and the strength of materials. Topics include stress determination, deflection and the behaviors of

tension, compression and shear in various structural elements. Coreq: ARCH 5340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5360 - Structures II

Focuses on the relationship between architectural concepts and the selection of structural systems. Addresses the qualitative and quantitative analysis of reinforced concrete, steel and wood structural systems and members. Prereq: ARCH 5350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5410 - Professional Practice

Introduces the essential elements of professional practice through topics such as internship, licensing, services, modes of practice, fees, marketing, documents, specification and production procedures. Examines traditional and emerging forms of practice. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5420 - BIM: Principles & Practices

Introduces basic aspects of building information modeling (BIM) concepts, software, development, management and delivery for architectural projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5430 - Social Context of Design

Focuses on the ethical, social, cultural and psychological principles, which people bring to the perception and design of the built environment. Its major topics include: ethical values; cultural patterns and values; social, cultural and personal ritual; and pre-design and programming. Prereq: Graduate ARCH students only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5450 - Sustainable Design Practices

This course explores sustainable principles and practices as it relates to the design, construction of both the building and its site. Prereq: Graduate ARCH and Graduate LDAR students only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 5510 - Architectural Graphics

This course explores the development of graphic skills emphasizing drawing as a means to design. It includes investigation of drawing types and methods; diagramming of ideas and systems; informative, exploratory and developmental sketching. Coreq: ARCH 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6150 - Design Studio V

The first of two reflective studios will assume reflective/critical stance towards programmatic issues or rather cultural presuppositions and critically explore the ways in which architecture can play a critical as well as an affirmative role

within the broader cultural context. Prereq: ARCH 5140. Coreq: ARCH 6151. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ARCH 6170 - Design Studio VI

This is the second of two reflective studios, which focuses on the comprehensive design of an architectural project including considerations of structural systems, environmental systems, life safety concerns, regulatory considerations, wall sections, building assemblies and significant detail. Prereq: ARCH 6150. Coreq: ARCH 6171. Max hours: 12 Credits. **Semester Hours:** 6 to 6

ARCH 6171 - Integration Seminar

In this seminar students will develop and document the technical aspects of their Design Studio VI design projects including, life safety, mechanical, electrical, plumbing, conveyance, accessibility systems and material assemblies. Prereq: ARCH 6150, ARCH 6151. Coreq: ARCH 6170. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ARCH 6180 - Furniture Design

Students learn how to design and build furniture in the College's woodshop. Topics include ergonometics, properties of materials, principles and techniques of joinery and techniques of hand and machine tools. Prereq: must have completed the college's woodshop training program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6185 - Digital Design & Fabrication

An introductory class to Computer Aided Design (CAD) and Computer aided manufacturing (CAM). Students explore how these technologies apply to the field of architecture with a focus is on parametric/algorithmic design approaches and mass customization manufacturing techniques. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6190 - Special Topics in Design Studies

Various topics in design, according to current faculty and student interests. Prereq: Completion of ARCH 5110. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ARCH 6205 - Urban Housing

This course examines housing trends and patterns; supply and demand factors; housing policies; housing challenges (e.g., inequitable distribution, special needs, segregation/discrimination, and homelessness); sociological, demographic, and economic considerations; and the roles of planners and the public and private sectors. Cross-listed with LDAR 6755 and URPL 6405. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6210 - History of American Architecture

Examines the history of American architecture from prehistoric times to the present, mainly within the geographical

borders of the present-day United States. Helps students understand the various cultural, technological, philosophical and aesthetic ideas that helped shape American buildings. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6212 - History of Modern Architecture

Examines the various theories, accomplishments and ideals of modern architecture in the 20th century. Issues include the relationship between theory and practice, architecture and ideology, technology, abstraction and representation, functionalism and formalism, utopianism and social responsibility. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6220 - History of Architectural Theory

Investigates the history of architectural theories in the West from antiquity to the present. Explores the various ideas that have been proposed to explain or to direct architectural design and examines the relationship between the theories and the buildings themselves. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6222 - Contested Terrains

Explores the different processes, factors and forces and determines and influences occupation, land use and built form through the phenomena of conflict and contestation. Design is inherently located within the disputes and discourses involving landscape as location and resource. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6230 - Preservation Theory and Practice

The practice of historic preservation has evolved in a specific policy context. This introductory course introduces basic American institutions and laws associated with preservation as well as standards, definitions, and practices associated with these. Cross-listed with HIPR 6010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6231 - Regionalisms & the Vernacular

This class explores the history of the built environment from the perspective of evolutionary change; peoples attempting to meet utilitarian needs, respond to environmental forces, societal expectations, and aesthetic aspirations through design. The course looks closely at vernacular structures in a global context. Cross-listed with HIPR 6110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6232 - Reading the City

Design and planning professionals, including preservationists, must learn to work in environments with which they have had little previous knowledge. This course emphasizes gaining understanding of a novel environment and translating that knowledge into a well researched and media savvy professional presentation. Prereq: HIPR 6410 is recommended. Cross-listed with HIPR 6610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6233 - Historic Buildings in Context

This course covers the concept of "historic significance" and develops skills in understanding and professionally utilizing this concept. Procedures and skills are introduced. Prereq: HIPR 6010 or permission of instructor. Cross-listed with HIPR 6210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6240 - History Of The City

Introduces students to the history of global cities through selected typologies. Explores similarities and differences among cities considered against the larger cultural, political and socio-economic envelope of which they are part. Provides awareness of origins, growth and evolution of urban form. Cross-listed with URBN 6640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6241 - Studies in Tectonics

This research seminar focuses on tectonics - the logic of structure & material combinations (wood, metal, stone, masonry etc.). Through case studies, the relationship between function, aesthetics, detail, and tectonics are explored in relation to contemporary architectural concerns. Prereq: HIST I & II. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6254 - Architecture, In Theory

Explores theories and texts that have influenced the analysis and the production of architectural form. The focus is on the expressive potential of architectural forms and the modalities of the realization of this potential. Prereq: Course is offered to doctoral students but masters students may enroll with instructor approval. Cross-listed with DSPL 7016. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6255 - Cultural Institutions

Selected types of cultural institutions including art museums, libraries, cultural centers, theaters, etc. are studied in this research seminar. Through case studies and readings, their ongoing cultural, architectural and corporate values are examined. Prereq: ARCH 5220 and 5230 or instructor approval. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6260 - Architectural Precedents

Explores a number of traditional answers to recurring design issues, such as how to approach and enter a building or how to design a facade. In a seminar setting, students examine traditional ideas for their underlying principles and design new architectural compositions based on those principles. Prereq: Completion of ARCH 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6275 - History Native Amer Arch

Introduces Native American architecture from the 12th century to the present. The course helps students understand the various cultural, technological, philosophical and aesthetic ideas that helped shape these buildings throughout history. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6290 - Special Topics in Cultural Studies

Various topics in cultural studies, according to current faculty and student interests. Prereq: ARCH 5210, ARCH 5220 and ARCH 5230. Max hours: 21 Credits. **Semester Hours:** 3 to 3

ARCH 6310 - Greenbuilding Tech

This seminar will advance the student's knowledge of environmental building and construction methods through studies in material resources, innovative green systems, alternate green technology, energy efficiency, and affordability in "green architectural design." Prereq: One course in ECS Systems. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6313 - LEED Certification, Greenbuilding Seminar

This RIGOROUS course will use the LEED Certification process to provide a framework for assessing building performance and meeting sustainability goals, following the 1st step in a two stage Professional Accreditation process, focusing on LEED GA, Green Associate Accreditation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6314 - LEED AP Advanced Greenbuilding Seminar

This advanced LEED Certification and Accreditation course builds on the first LEED GA course, providing a framework for assessing green building performance and sustainability goals, exploring advanced green building concepts and preparing the student for the LEED AP BD+C exam. Prereq: ARCH 6313 or instructor approval. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6351 - Building Conservation

This course emphasizes the relationship between knowledge acquisition, professional judgement, and design modification. Topics include: 1) Historic Building Types & Methods, 2) Field and Lab Methods of Building Assessment, and 3) Management of Building Rehabilitation. The course takes an integrative approach to the scientific, aesthetic, managerial and legal dimensions of preservation. Prereq: ARCH 5310 and ARCH 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6352 - Documentation, Analysis, Representation

This methods course focuses on skills development in in-situ documentation of the historic environment. The course includes modules on: a) historic records, b) archaeological evidence, c) building and site measurement, d) photographic & Photometric methods, e) geo-spatial data, f) graphic representation, and g) reporting formats. Cross-listed with HIPR 6310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6353 - Daylighting Design

Daylighting is the use of light from the sky to illuminate building interiors. The objective of this course is to introduce

students to the fundamentals of daylighting design including how it is perceived and how it impacts building energy flows. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6355 - Urban Conservation: Context for Reuse

Human habitats (especially cities) are dynamic. The preservationist cannot freeze cities in a static representation of the past. The course deals with philosophical and political contexts, but emphasizes the role of strategic design intervention in the shaping of evolving cities. Cross-listed with HIPR 6410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6370 - Introduction To Design Build

Introduction to Design Build project delivery methods important to architects. Lecture, research on the industry and an individual student project are the methods used to introduce ethical questions, role of the architect, owner, consultant and subcontractors. Work leads to studio project or case study. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6373 - Construction in Design Build

Using a single project, students fully explore the design phase, estimating, scheduling and project management skills in traditional construction. Course is concurrent with an advanced studio and builds a project on a site. Prereq: ARCH 6370. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6375 - Green Tech I

Green Tech I is the first of two courses that are a "real build" course in which students advance their knowledge of environmental design through full-scale construction of architectural elements, furnishings, accessories, finishes, outdoor gear, or even clothing. Coreq: ARCH 6376. Restriction: Restricted to Architecture graduate students within the College of Architecture and Planning. Cross-listed with ARCH 3804. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6376 - Green Tech II

Green Tech II is the second of two courses that is a "real build" course in which students advance their knowledge of environmental design through full-scale construction of architectural elements, furnishings, accessories, finishes, outdoor gear, or even clothing. Students must be enrolled in both Green Tech I and Green Tech II in the same semester. Coreq: ARCH 6375. Restriction: Restricted to Architecture graduate students within the College of Architecture and Planning. Cross-listed with ARCH 3806. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6390 - Special Topics in Technology

Various topics in technology, according to current faculty and student interests. Prereq: ARCH 5310 and ARCH 5320. Max hours: 18 Credits. **Semester Hours:** 3 to 3

ARCH 6412 - Construction Documents

Introduces the concepts and techniques of construction documents. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6413 - Construction Leadership

The final course is an integrated architecture, engineering, and construction business course bringing together executives, principals, and managers to current industry topics and provide students opportunities to apply management and leadership principles from the various fields to case study projects. Crosslisted with CVEN 5238. Restriction: Restricted to graduate students. Undergraduate students with Departmental Chair's permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6420 - Integrated Practice & BIM Technology

This class will be a general overview of integrated practices and technologies used in today's industry. Understanding the nature of how information is created and managed using BIM technologies will help us define a road map for how information passes downstream and bring value to a project. Restriction: Restricted to graduate students. Undergraduate students with Departmental Chair's permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6450 - Pre-Design

Course lectures, readings, and case studies cover pre-design methodologies, research, documentation, facilitation and consensus building. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6463 - BIM: Emerging Prof. Practices

The 21st century architect's emerging role is designing the design process. BIM (Revit) attempts to optimize the entire process, including all participants, from conceptual design, through post-building occupancy. These capabilities are explored and developed. Prereq: ARCH 5430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6464 - BIM: Advanced Design Concepts

BIM's complexity (Revit) challenges all designers. The emerging tool is very sophisticated, but its benefit are not realized from modeling alone. We address architectural design as a multifaceted optimization process: concept, form, and function. Prereq: ARCH 5430. Cross-listed with ARCH 6390. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6470 - ACE Mentoring

Graduate students work with professional architects, designers, and engineers mentoring students in selected local high schools to learn problem solving, graphics and model making to produce a design project. Student mentors develop lesson plans, outcomes and keep a weekly journal. Cross-listed with LDAR 6470 and URPL 6850. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6471 - Managing Quality & Risks

A lecture and seminar on approaches to risk management including contracts, insurance, financial analysis, dispute resolution and client relationships. Utilizing case study approach, quality assurance will be defined and studied in the design and building phase of workings. Prereq: ARCH 6370. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6472 - Architecture in a Single Source Project Delivery

Directed to the practice of architecture with design build and other single source delivery systems. This course examines requirements of codes, zoning, building systems and legal questions for the architect. Prereq: ARCH 6370. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6473 - Research Tools & Methods

Introduces the thesis in architecture and establishes the scholarly basis for the research and construction of a Master's Thesis project. This course will provide the student with the research practices and methodologies to develop the scholarship and products required to produce a Thesis Project Proposal. Completion of this course is a prerequisite for the student to submit the Thesis Proposal for departmental approval to continue with the remaining 9 credits of thesis work. Cross-listed with LDAR 6949. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6490 - Special Topics in Professional Studies

Various topics in professional studies according to current faculty and student interests. Max hours: 18 Credits. **Semester Hours:** 3 to 3

ARCH 6510 - Digital Applications in Design

This course introduces first year design students to the Graphic Design Concepts and Digital Applications necessary to create digital, printed and physical presentations of their work. Students learn computer skills including: raster and vector based programs and digital modeling. Prereq: ARCH 5110 and ARCH 5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6515 - Adv. Digital Representation

In this course students will learn advanced techniques of architectural representation using digital modeling, rendering engines, and post processing in the Adobe Creative Suite. Prereq: ARCH 5510 and 6510 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6530 - The Art of Proportion

This course covers the use of proportional systems in the Classical tradition. Students complete a series of graphic exercises culminating in the construction of a Beaux-Art style ink-wash of a classical column. Cross-listed with ARCH 6290 and HIPR 6090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6550 - Digital Portfolio Design

This course introduces students to the Graphic Design Concepts and the Digital Applications used to create both Printed and Web-based Portfolios. Students must have completed ARCH 5110 and have a working knowledge of Photoshop. Prereq: ARCH 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6560 - Architecture Photography

Emphasizes and understanding of light, composition, color and problem solving, with a particular goal of applying these skills to the photography of architectural exteriors and interiors. For students who have access to adjustable 35 mm digital cameras. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6570 - Sketching As Seeing

Sketching promotes seeing, and seeing promotes thinking. This course is designed to help you think & see by the regular practice of sketching & the discipline of keeping a sketchbook. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6590 - Special Topics in Representational Studies

Various topics in representational studies, according to current faculty and student interests. Prereq: ARCH 5510. Max hours: 15 Credits. **Semester Hours:** 3 to 3

ARCH 6710 - Architecture in Other Cultures

Various studies of architecture and urbanism in foreign countries. Max hours: 12 Credits. **Semester Hours:** 1 to 9

ARCH 6715 - The Built Environment in Other Cultures I: Research Design

The intent is to broaden students' perspectives by asking them to examine design within another culture. Each student prepares a proposal of study including a statement of the problem to be addressed, the type of field research to be undertaken and the nature of the report to be produced. Cross-listed with LDAR 6624. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6730 - International Studies Preparation

The course will prepare students to go to China, for 10-day International Summer School, 5-week China Summer Urban Design Joint Studio, 9-month Gensler Internship, and 1-year LA Dual Degree program. Topics include historic, geographic and cultural issues, and language lessons. Cross-listed with URBN 6730, LDAR 6730, and URPL 6730. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ARCH 6775 - Bluff General Elective

Provides students the opportunity to focus their attention on one of three areas: technical studies, professional studies,

or cultural studies. Students will complete coursework as it relates to Design Build Bluff. Counts as a general elective. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6840 - Independent Study

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to architecture. Prereq: Permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ARCH 6910 - Teaching Assistantship

Work with a faculty member in a course to help with class preparation and delivery. This is intended for students who may be considering a career in teaching architecture. Prereq: Permission of instructor. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ARCH 6930 - Architecture Internship

Designed to provide professional practice experience. The internship is composed of eight hours per week working in a practicing professional's office during the regular semester. Students must complete the second-year level before taking this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 6931 - Architecture Internship

Designed to provide professional practice experience. The internship is composed of eight hours per week working in a practicing professional's office during the regular semester. Students must complete the second-year level before taking this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARCH 7840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ARTS 1000 - Arts In Our Time

Multidisciplinary course designed to introduce students to the ways in which arts work and how the arts shape our perception of the world around us. Each student selects three four-week modules designed to examine each of the disciplines of fine arts, music and theatre, in the context of the creative process, audience perception and historical perspective. Every five weeks, students from each of the modules join forces in a week of "Inter-arts" sessions -- lectures and discussions about the relationship of the arts to each other and to our contemporary culture. Topics which are addressed in the modules include such things as American musical theatre, perception of jazz, public sculpture, light as art, sonic explorations, photography, history of production design, women in American music and censorship. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARTS 1111 - Freshman Seminar

The course explores the nature of creative inspiration, its potential and implementation. Through individual and collaborative projects, students investigate the interdisciplinary composition and development of the literary, visual and performing arts and their aesthetic, social and political impact. Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARTS 1150 - Topics in Cross-Disciplinary Arts I

Designed to explore the ways in which the arts are a part of daily life. Research and observation of the variety of ways in which the arts are utilized. Prepares students to participate in special projects. Specific topics and projects change each semester. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ARTS 1400 - The Horror Film

This course is an analysis of the horror film genre and its significance as a reflection on society. It will look at both the history and development of this genre and the impact these films have had. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARTS 2150 - Topics in Cross-Disciplinary Arts II

Provides opportunities for students to apply artists' methods and media in a non-presentation setting. Experiential research is centered around a specific topic each semester, but enable students to discover a broader understanding of the arts. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ARTS 3150 - Topics in Cross-Disciplinary Arts III

Focuses on the ways in which the arts are engaged in communities as expressions of identity as well as agents of change. Historical research and applied projects provide a foundation for participation in designated team projects. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ARTS 3400 - World Cinema

This course will examine representative examples of films from around the world to understand the current interests and concerns of world cinema, as well as to learn what concerns various countries around the world, and how those concerns are expressed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ARTS 4150 - Topics in Cross-Disciplinary Arts IV

Investigates the historical and critical perspectives of the arts in a variety of contexts. Specific topics provide a focus for students to discover the ways in which the arts inform each other and are shaped by the events of the world. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ARTS 4939 - Internship

Students build professional skills and increase their understanding of creative industries through experiential learning and course work designed to expand internship experiences into powerful learning. Assigned readings, group discussions, weekly summaries, and final paper/presentation support and reflect internship activities and build interpersonal, organizational, and industry specific skills while increasing knowledge of business practices and professionalism. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ARTS 5000 - Topics

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ARTS 5150 - Topics In Cross-Disciplinary Arts

Investigates the historical and critical perspectives of the arts in a variety of contexts. Specific topics provide a focus for students to discover the ways in which the arts inform each other and are shaped by the events of the world. Max hours: 9 Credits. **Semester Hours:** 1 to 3

BANA 2010 - Business Statistics

Basic principles of probability and statistics with applications in business. Includes descriptive statistics, probability and probability distributions, data collection, sampling distributions, statistical inference, simple regression and the use of a computer to perform statistical analysis. Students are required to present their analyses in written and/or oral form and defend their conclusions. This is a business core course. Therefore a grade of a 'C' or better must be earned to satisfy Business graduation requirements and prerequisites for other business courses. Prereq: MATH 1070 or MATH 1110 with a grade of C- or higher. Restriction: Restricted to undergraduate students at a sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 3000 - Operations Management

Introduces the concepts and methods commonly used in manufacturing and service operations. Topics include aggregate planning, inventory control, scheduling, quality control, and linear programming. This is a business core course. Therefore a grade of a 'C' or better must be earned to satisfy Business graduation requirements. Prereq: DSCI 2010/BANA 2010 and ACCT 2200 both with a grade of 'C-' or higher. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 4840 - Independent Study

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

BANA 4950 - Special Topics in Business Analytics

Course offered on an irregular basis for the purpose of presenting new subject matter in Business Analytics. Prereq: Will vary depending upon the particular topic and instructor. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 3

BANA 6610 - Statistics for Business Analytics

Provides a conceptual overview of statistical thinking and its applications to business problems. Topics include descriptive statistics, data exploration, probability, inferential methods, and regression analysis. Students gain hands-on experience with data analytic problems via projects using real business settings and data. Max hours: 3 Credits.

Semester Hours: 3 to 3

BANA 6620 - Computing for Business Analytics

Introduces database and modeling software used by business analytics professionals. Includes querying relational databases, state-of-the-art statistical freeware, and modeling software. Students learn to obtain, organize, and store data needed for analytics projects, undertake data cleansing for big data tasks, and conduct statistical data visualization. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School.

Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6630 - Business Forecasting

Students learn forecasting methodologies such as ARIMA, regression, smoothing, and time-series decomposition applicable to marketing, finance, accounting, human resources management, and supply chain and production management decision-making. This course focuses on practical applications of forecasting techniques, choosing and comparing appropriate methods and applying the results to workplace situations. Prereq: BANA 6610 or FNCE 6290 or BUSN 6530-- BUSN 6530 must be completed with a Grade of A- (3.7). Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Cross-listed with FNCE 6372. Note: Can only receive credit for either BANA 6630/DSCI 6230 or FNCE 6372. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6640 - Decision Analysis

Examines business decision making under conditions of risk and uncertainty using quantitative decision analysis methods such as utility theory, value of information, influence diagrams, decisions with conflicting objectives and hierarchical structured models. Psychological issues and informal fallacies in the decision making process will be discussed. Applications include decisions commonly encountered in capital acquisitions, financial investments, quality control, project selection, strategic planning, production control and human resource management. Student computer-assisted projects are conducted. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6650 - Project Management

Introduces the topic of Project Management (PM) in a business environment. Emphases will include the knowledge, skills, tools, and techniques as presented in the Project Management Body of Knowledge (PMBOK) a variety of managerial aspects commonly encountered in PM, and current extensions of PM. Projects in diverse contexts are

examined. Cross-listed with URPL 6249. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6660 - Predictive Modeling with Big Data

Addresses statistical approaches to the very large data sets increasingly common in business applications such as internet-based business, fraud detection, credit scoring and market segmentation. Topics include limitations of classical statistical when applied to large data sets, alternative approaches and applications. Emphasis is placed on proper choice of method, interpretation of the results and understanding of the strengths and limitations of the methods. Students are expected to analyze and report on a variety of data sets drawn from business application areas. Prereq: BANA 6610 or FNCE 6290 or BUSN 6530-- BUSN 6530 must be completed with a Grade of A- (3.7). Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits.

Semester Hours: 3 to 3

BANA 6720 - Simulation Modeling

Students learn to model and analyze complex dynamic systems using state-of-the art software. Illustrative application areas include production systems, service systems, distribution systems and health care systems. Topics include creating reliable simulation models, analyzing the input and output from the model, and managing simulation projects. A substantial part of the course will be devoted to student projects where students define, model and analyze a significant system of their choosing. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6730 - Supply Chain Management

Introduces the design, analysis, management, and control of supply chains. Because of continuing advances in globalization, sustainability, and information technology, course emphasis will include integration of processes and systems, relationship management of upstream and downstream players, and strategies that incorporate current and future trends. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6740 - VBA for Business Analytics

This course teaches the essentials of Visual Basic for Applications (VBA), the programming language for Microsoft Office. Focus in using VBA as a tool to automate common tasks and to create business analytic applications. Goal is to hid the details of the analytical and modeling techniques by creating user interfaces for inputs and then presenting managerially relevant results. Prereq: BUSN 6630 and BANA 6620 with a grade of C (2.0) or higher, or permission of instructor. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BANA 6800 - Special Topics

A number of different current topics in business analytics are discussed in this course. Consult the current schedule for semester offerings. Prereq: Permission of instructor. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 12 Credits. **Semester Hours:** 3 to 12

BANA 6840 - Independent Study

Instructor approval is required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BANA 6910 - Business Analytics Practicum

Students apply business analytics methodologies to a real-life business problem in cooperation with a local organization. Under the supervision of faculty, students engage in problem definition, analysis and solution. Results are presented in oral and written form to the sponsoring organization. Because the practicum is a capstone course, it is not appropriate for students just beginning the program. Prereq: Will vary depending upon the particular topic (consult the schedule of classes). Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 3070 - Bioengineering Lab I

Core bioengineering lab required of all major students. This lab introduces students to experimental techniques in the areas of Biomaterials, Biomedical Instrumentation, and Biomechanics. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 3929 - Undergraduate Research Project

Department of Bioengineering Research Project. Credit may not be applied toward the BS in Bioengineering degree. Enrollment by department permission only. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOE 3939 - Undergraduate Internship

Department of Bioengineering Internship. Credit may not be applied toward the BS in Bioengineering degree. Enrollment by department permission only. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOE 4035 - Undergraduate BioDesign II

This represents the second semester of the core undergraduate Biodesign sequence. Students gain experience around Design and Prototyping, Verification and Validation, and evaluation of key components around biomedical technology development. Prereq: BIOE 3090. Restriction: Restricted to full Bioengineering majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4045 - BioDesign III

This course represents the capstone culmination of the core undergraduate Biodesign experience. Students finalize all design, prototyping, testing and validation components, and present the project per professional standards to

professionals and peers. Prereq: BIOE 4035. Restriction: Restricted to full Bioengineering majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4053 - Optics and Microscopy in Biomedical Research

Undergraduate overview of optical imaging, ranging from classical microscopy to advanced, non-linear techniques and includes theory, technology and applications in biomedical sciences. This will prepare students for developing and applying state-of-the-art optical imaging in their research. Cross-listed with BIOE 5053. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4064 - Advanced MatLab For Bioengineers And Life Scientists

MatLab programming for undergraduate bioengineers and life scientists. Topics include MatLab syntax and optimization as well as techniques for working with scalars, time-series, images and multi-dimension datasets. Surface/Curve fitting, modeling, automation and classification will be covered. Cross-listed with BIOE 5064. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4065 - Introduction to iOS Apps

This course will introduce students to best practices in developing Health centered iOS Apps. Topics will focus on Xcode, Object Oriented Design, Objective-C, Cocoa, Core Data and the iOS emulator. Cross-listed with BIOE 5065. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4066 - Advanced Topics in iOS Apps

This course will introduce undergraduates to advanced topics focused on creating health centered iOS Apps. Topics will cover best practices for developing Apps across the iOS product lineup including Apple Watch and developing for Apple Health kit. Deployment and validation will also be covered. Cross-listed with BIOE 5066. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4068 - Imaging for Bioengineers

This course will introduce undergraduates to the basic physics, technologies, and clinical methodologies underlying Ultrasound, MRI, CT, PET and SPECT imaging systems. The course will include lectures, and visits to campus hospital and research imaging systems as well as hands on ultrasound labs. Cross-listed with BIOE 4068. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4069 - Advanced Biomechanics for Undergraduates

This course builds on the Introduction to Biomechanics course. It covers advances topics such as blood flow dynamics, introduction to non-linear finite deformation techniques, blood rheology, and computational techniques. Restriction:

Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits.

Semester Hours: 3 to 3

BIOE 4073 - Neural Interfaces and Bionic Limbs

This course will introduce undergraduates to topics in neural interfaces (Brain machine interfaces, peripheral nerve interfaces etc), the issues involved in the design of mechatronic limb systems and the decoding algorithms used to map the neural interface to the mechatronic limb. Cross-listed with BIOE 5073. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4083 - Polymers in Biomedical Applications

This course will introduce undergraduate students to fundamental synthetic method and basic characteristics of various polymeric biomaterials and their crucial roles in different biomedical applications. It will also cover how the polymers can be modified to enhance biomedical applications. Cross-listed with BIOE 5083. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 4085 - Tissue Engineering

This course covers tools, techniques, characterization and applications in modern tissue engineering. Cross-listed with BIOE 5085. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5010 - Cell and Molecular Biology for Bioengineers

Introduction to cellular and molecular biology, with a focus on using engineering methods and literature to analyze structure and function of cells throughout lifecycle and multiple scales. Design experiments to test hypotheses. Prereq: Graduate standing in Bioengineering or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5011 - Systems Physiology for Bioengineers

Use engineering principles to study key physiological systems. Topics: cardiovascular, neuroscience, urological, or renal medicine. Related engineering principles: pressure-flow relationships, stress-strain, electromechanical coupling and signal transduction. Prereq: Graduate standing in Bioengineering or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5020 - Analytic Methods for Engineering Analysis

This course provides mathematical tools essential for graduate level bioengineering work. Studies selected topics from probability, linear algebra, and vector calculus, with emphasis on bioengineering applications. Prereq: Graduate standing in Bioengineering or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5021 - Numerical Methods for Engineering Analysis

Provides computational skills and knowledge of numerical methods for engineering/scientific computation using Matlab. Topics: root finding, interpolation, difference and integration rules, solution of initial and boundary value ODEs, and introduction to the solution of PDEs. Prereq: Graduate standing in Bioengineering or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5030 - Technology for Bioengineers

This course will prepare students fundamental bioengineering principles common to areas of active research. This includes fundamental principles behind systems and instrumentation in mechanics, electronics, fluid flow and clinical imaging modalities, as well as an introduction to polymeric biomaterials. Prereq: Graduate standing in Bioengineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5031 - Technology for Bioengineers II

This course continues the introduction to imaging from BIOE 5030 (Technology for Bioengineers I) but with a much stronger emphasis on quantitative methods of medical image analysis and description of medical imaging physics. Prereq: Graduate standing in Bioengineering. Grade of B or better in BIOE 5030, or consent of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5040 - Research Methods for Bioengineers

This course provides an introduction to research methods for bioengineers in order to prepare for basic research, clinical applications and commercialization of medical technologies. Topics include literature review, regulatory policy. Prerequisite: Graduate standing in Bioengineering (MS/PhD). Max hours: 2 Credits. **Semester Hours:** 2 to 2

BIOE 5041 - Clinical Experiences for Bioengineers

This course provides opportunities for clinical experiences such as observing surgeries and touring intensive care units to prepare students for clinical applications and foster collaborations with clinical practitioners. Experiences take place through the school year. Prerequisites: Graduate standing in Bioengineering (MS/PHD). Max hours: 1 Credit. **Semester Hours:** 1 to 1

BIOE 5053 - Optics & Microscopy in Biomedical Research

Graduate overview of optical imaging, ranging from classical microscopy to advanced non-linear techniques and includes theory, technology and applications in biomedical sciences. This will prepare students for developing and applying state-of-the-art optical imaging in their research. Cross-listed with BIOE 4053. Prereq: Grad standing or permission from the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5063 - 3D Modeling for Bioengineers

Course instills 3D modeling skills specific to biomedical industry. Topics include computer aided design, medical imaging, image processing, patient specific image to three-dimensional model reconstruction, non-uniform rational b-

spline surfaces, finite element, computational fluid dynamics analyses, physical modeling using rapid prototyping. Restrictions: Matriculated CEAS students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5064 - Advanced MatLab For Bioengineers And Life Scientists

MatLab programming for graduate bioengineers and life scientists. Topics include MatLab syntax and optimization as well as techniques for working with scalars, time-series, images and multi-dimension datasets. Surface/Curve fitting, modeling, automation and classification will be covered. Cross-listed with BIOE 4064. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5065 - Introduction to iOS Apps

This course will introduce graduate students to best practices in developing Health centered iOS Apps. Topics will focus on Xcode, Object Oriented Design, Objective-C, Cocoa, Core Data and the iOS emulator. Cross-listed with BIOE 4065. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5066 - Advanced Topics in iOS Apps

This course will cover advanced topics focused on creating health centered iOS Apps. Topics will cover best practices for developing Apps across the iOS product lineup including Apple Watch and developing for Apple Health kit. Deployment and validation will also be covered. Cross-listed with BIOE 4066. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5068 - Imaging for Bioengineers

This course will introduce graduate students to the basic physics, technologies, and clinical methodologies underlying Ultrasound, MRI, CT, PET and SPECT imaging systems. The course will include lectures, and visits to campus hospital and research imaging systems as well as hands on ultrasound labs. Cross-listed with BIOE 4068. Restriction: Restricted to Bioengineering students with graduate student status. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5073 - Neural Interfaces and Bionic Limbs

This course will introduce graduate students to topics in neural interfaces (Brain machine interfaces, peripheral nerve interfaces etc), the issues involved in the design of mechatronic limb systems and the decoding algorithms used to map the neural interface to the mechatronic limb. Cross-listed with BIOE 4073. Restrictions: Matriculated CEAS students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5074 - Introduction to Laboratory Animal Research

This course provides basic theoretical and practical knowledge on the use of the most common laboratory animal species, animal models and welfare, general concepts on animal biology and husbandry, and essential principles of anesthesia, analgesia, surgery and peri operative care. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5083 - Polymers in Biomedical Applications

This course will introduce graduate students to fundamental synthetic method and basic characteristics of various polymeric biomaterials and their crucial roles in different biomedical applications. It will also cover how the polymers can be modified to enhance biomedical applications. Cross-listed with BIOE 4083. Prereq: Graduate standing at CU Denver or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5085 - Tissue Engineering

This course covers tools, techniques, characterization and applications in modern tissue engineering. Cross-listed with BIOE 4085. Restriction: Restricted to BIOE-BS majors within the College of Engineering and Applied Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOE 5420 - Special Topics in Bioengineering

Special topics of particular interest to graduate students in Bioengineering. Prereq: Graduate standing within the Department of Bioengineering or permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 6

BIOE 5840 - Independent Study in Bioengineering

Graduate level independent study in Bioengineering with a faculty mentor. Prereq: Graduate standing within the Department of Bioengineering or permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOE 6655 - Foundations of Doctoring MS Years

This course is for CU MD-MS students who are on leave of absence from SOM and wish to maintain clinical exposure and training during the leave. Prereq: Phase I & II SOM classes and graduate standing in BIOE. Max hours: 20 Credits. **Semester Hours:** 1 to 5

BIOE 6950 - Masters Thesis

Research for Master Thesis under supervision of faculty thesis advisor. Prerequisites: Consent of thesis advisor. Restrictions: Satisfactory progress toward MS-Bioengineering degree. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOE 6960 - Master's Project

Training for Master's Project under the supervision of faculty project advisor. Prereq: Department Consent. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOE 8990 - Doctoral Dissertation

Research for doctoral dissertation under supervision of faculty advisor. Prerequisites: Consent of dissertation advisor. Restrictions: Satisfactory progress toward PhD-Bioengineering Degree. Max hours: 10 Credits. **Semester Hours:** 1 to 10

BIOL 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

BIOL 1136 - Human Biology

Topics include: basic human body chemistry, healthy internal body balance, new disease treatments, human inheritance and human beings as part of Earth's living systems. Note: For students who are not majoring in biology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 1550 - Basic Biology: Ecology and the Diversity of Life

Introduces important biological concepts, including: the process of science, biological diversity, evolution, basic ecological principles and environmental issues. Lectures emphasize current issues. Note: For students who are not majoring in biology. Biology and health career majors should not take this course. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1 **Semester Hours:** 4 to 4

BIOL 1560 - Basic Biology: From Cells to Organisms

Introduces students to cell structure and function, survey of representative human systems, genetics and applications of biotechnology. Immune systems featured with an emphasis on Aids, cancer and other human diseases prevalent in today's world. Note: For students who are not majoring in biology. Biology and health career majors should not take this course. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 4 to 4

BIOL 2051 - General Biology I

Introduces four major areas of study: (1) the chemistry of biological systems; (2) the structure and function of the cell; (3) cellular energy transformations (photosynthesis and respiration); and (4) genetics (mitosis, meiosis, patterns of inheritance, molecular genetics). Note: This class is intended for students planning to take upper division biology courses and for biology majors. Biology majors and pre-health career students must also take the accompanying laboratory - BIOL 2071. It is recommended that students have completed CHEM 1000 or high school chemistry prior to taking this course. No co-credit with BIOL 2095. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 3 to 3

BIOL 2061 - General Biology II

This course is a continuation of BIOL 2051. Introduces four major areas of study: (1) evolution,(2) animal structure and function, (3) plant structure and function and (4) ecology. Note: This class is intended for students planning to take upper division biology courses and for biology majors. Biology majors and pre-health career students must also take the accompanying laboratory - BIOL 2081. Prereq: BIOL 2051 or 2095 with a grade of "C-" or higher. No co-credit with BIOL 2097. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 3 to 3

BIOL 2071 - General Biology Laboratory I

Introduces the basic scientific approach and report preparation through exercises and experiments in cell biology, basic biochemical techniques, genetics, molecular genetics and applications of biotechnology. Note: Exercises corresponding to topics in BIOL 2051. Note: This class is intended for students planning to take upper division biology courses and for biology majors. Prereq: BIOL 2051 or 2095 with a grade of "C-" or higher or concurrent enrollment in BIOL 2051 or 2095. No co-credit with BIOL 2096. Max hours: 1 Credit. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

BIOL 2081 - General Biology Laboratory II

Study of evolution, plant and animal anatomy, developmental biology; includes two off-campus ecology field trips. Note: Exercises corresponding to topics in BIOL 2061. Note: This class is intended for students planning to take upper division biology courses and for biology majors. Prereq: BIOL 2051 or 2095 and 2071 or 2096 with a C- or higher. Students are strongly encouraged to take BIOL 2061 concurrently or before they take this course. No co-credit with BIOL 2098. Max hours: 1 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

BIOL 2091 - General Biology Lab for Secondary Teacher Licensure

One-semester general biology laboratory for those students who are pursuing secondary science teacher licensure. Introduces the scientific method through select exercises and experiments in cell biology, basic biochemical techniques, genetics, molecular genetics, anatomy, physiology, and development, ecology, and evolution. Note: Exercises corresponding to select topics in BIOL 2051 and BIOL 2061. Will not fulfill biology major requirements. Students completing BIOL 2071 and BIOL 2081 may not receive credit for BIOL 2091, nor may students completing BIOL 2091 receive credit for BIOL 2071 and BIOL 2081. Prereq: BIOL 2051 with a grade of C- (1.7) or higher. Coreq: BIOL 2061. Max hours: 1 Credit. **Semester Hours:** 1 to 1

BIOL 2095 - Honors General Biology I

Honors level course limited to students in the BA/BS/MD, Denver Bound and UNHL programs. Four major topics covered: the chemistry of biological systems, the structure/function of the cell, cellular energy transformations and genetics. Prereq: BIOL 2096 must be taken in conjunction with this course. Instructor permission required. No co-credit with BIOL 2051. Coreq: BIOL 2096. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 3 to 3

BIOL 2096 - Honors General Biology Lab I

Honors level course limited to students in the BA/BS/MD, Denver Bound and UNHL programs. Introduces the basic scientific approach and report preparation through exercises and experiments in cell biology, basic biomedical techniques, genetics, molecular genetics and applications of biotechnology. Prereq: BIOL 2095 must be taken in conjunction with this course. Instructor permission required. No co-credit with BIOL 2071. Coreq: BIOL 2095. Max hours: 1 Credit. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

BIOL 2097 - Honors General Biology II

Honors level course limited to students in the BA/BS/MD, Denver Bound and UNHL programs. This course is a continuation of BIOL 2095. Introduces four major areas of study: evolution, animal structure/function, plant structure/function, and ecology. Prereq: Students need to have completed BIOL 2095 and 2096 with a C- (1.7) or higher and be in the student group BH01. Instructor permission required. No co-credit with BIOL 2061. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 3 to 3

BIOL 2098 - Honors General Biology Lab II

Honors level course limited to students in the BA/BS/MD, Denver Bound and UHL programs. Advanced study of evolution, plant and animal anatomy, developmental biology and includes two off-campus ecology field trips. Prereq: Students need to have completed BIOL 2095 and 2096 with a C- (1.7) or higher and be in the student group BH01. No co-credit with BIOL 2081. Max hours: 1 Credit. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

BIOL 2750 - Introduction to Molecular Research Techniques

Designed to give background knowledge and hands-on experience for a person wanting to work in a molecular-research laboratory. Introduction to basic molecular techniques including micropipetting, making media, DNA and RNA isolation, restriction digest, RT-PCR, and gel electrophoresis. Max hours: 2 Credits. **Semester Hours:** 2 to 2

BIOL 2840 - Independent Study

Note: registration by special processing form only. Prereq: One semester of general biology with a grade of "C-" or higher and permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

BIOL 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

BIOL 3104 - Behavioral Genetics

Interdisciplinary course on relationships between behavior and heredity, with emphasis on human behavioral genetics. One year of general biology or general psychology are strongly recommended for optimal student success. Cross-listed with PSYC 3104. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3124 - Introduction to Molecular Biology

Provides an understanding of the structure and function of genetic material, with respect to the regulation of gene expression and protein synthesis. Emphasizes eukaryotic systems and understanding the significance of contemporary laboratory-based research. Prereq: BIOL 3832 with a grade of C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3134 - Advanced Topics

Periodic examination of current topics in the field of biology. (See Schedule Planner for current topics). Max hours: 9 Credits. **Semester Hours:** 1 to 8

BIOL 3225 - Human Physiology

The basic orientation of the course is toward understanding the functioning of the body as a set of homeostatic mechanisms. Particular emphasis is placed on membrane potentials, muscle, circulation, respiration, digestion, the kidney, the control of metabolism and acid-based balance. Prereq: BIOL 3611 and CHEM 2031/2081, 2038/2088, 2061/2091 and 2068/2098 with a C- or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 3244 - Human Anatomy

Introduces the structural aspects of the human body. Anatomical models, microscope slides and dissections, including human cadavers are used in the lab. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096 and 2081/2098 with a C- or higher. Max hours: 5 Credits. **Semester Hours:** 5 to 5

BIOL 3330 - Plant Diversity

Surveys all major plant groups using evolutionary and ecological principles to interpret patterns of diversity in form and function. Topics include reproduction and life cycles, adaptations and ecological interactions, paleobotany and biogeography, classification and taxonomy and evolution. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096 and 2081/2098 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3411 - Principles of Ecology

A lecture course that examines the interrelationships between organisms and their environments. Subject matter includes organism, population and ecosystem levels of study and application to current environmental issues. The emphasis is on the underlying principles of ecology that involve all types of organisms. Note: Satisfies core ecology requirement for biology major. May not be used as upper division biology elective. No co-credit with BIOL 3412. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096, and 2081/2098 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3413 - Ecology Laboratory

Provides hands-on experiences in ecology and appreciation for using research tools to study ecological systems. Students will learn a wide range of techniques and concepts related to population, community, ecosystem, urban, and physiological ecology. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, or be concurrently enrolled in BIOL 3411 in order to enroll in this course. Max hours: 2 Credits. **Semester Hours:** 2 to 2

BIOL 3445 - Introduction to Evolution

Introduction to the processes and patterns of evolution. Topics include: history of evolutionary thought, origin of life, evidence for evolution, phylogenetics, evolutionary genetics, natural selection and other evolutionary forces, speciation and biodiversity, evolution of sexual reproduction and social organization. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096 and 2081/2098. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3520 - Invertebrate Zoology

Most species on earth are invertebrate animals that, by definition, lack backbones. This course examines the biology, taxonomy, anatomy, ecology and evolution of these important creatures, which occupy a diversity of terrestrial, freshwater and marine habitats. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096, and 2081/2098 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3521 - Vertebrate Biology

The subphylum vertebrata consists of fish, amphibians, reptiles, birds and mammals--some of the most fascinating and most threatened species on earth. This course covers the geological record, evolution, taxonomy, anatomy, physiology, ecology and conservation of these organisms. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096, and 2081/2098 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3611 - General Cell Biology

Covers the structure and function of the cell including bioenergetics, membranes, secretion, respiration and the cell cycle. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096, 2081/2098 and CHEM 2031/2081, 2038/2088, 2061/2091 and 2068/2098 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3612 - Cell Biology Laboratory

Laboratory course covering topics in cell and molecular biology, such as protein folding, membrane potential, organelle function, cell signaling and fertilization; as well as associated methods, including microscopy, cell culture and PCR. Basic skills are emphasized in recitation and laboratory. Prereq: General cell biology with a grade of "C-" or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3621 - Introduction to Immunology

Provides an introduction to the basic concepts of immunology, including development of the immune system, innate immunity, aspects of the adaptive immune system, and the role of the immune system in disease, as well as allergies and autoimmunity. Prereq: BIOL 3611 and 3832 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 3654 - General Microbiology

Covers all aspects of the biology of microorganisms: their cellular structures and function, growth and metabolism, general and molecular genetics, diversity and interactions with other organisms and the environment (ecology). The objective is to provide students with a thorough introduction to microbiology including basic micro-biological

laboratory techniques. Prereq: Grade of C- (1.7) or higher in BIOL 2051/2095, 2061/2097, 2071/2096, 2081/2098 & CHEM 2031/2081, 2038/2088, 2061/2091 and 2068/2098. Max hours: 5 Credits. **Semester Hours:** 5 to 5

BIOL 3763 - Biostatistics

Introduces statistical thinking in biology. Emphasizes data exploration and probability-based inference methods including estimation, testing, and confronting models with data. Concepts and examples for general and applied biology, including ecology and the health sciences. Includes exposure to statistical software. Prereq: BIOL 2051/2095, BIOL 2061/2097, BIOL 2071/2096, BIOL 2081/2098 with a grade of C- or higher, and MATH 1110, or MATH 1120, or 1130, or 1401, or MATH 2830 with a B or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 3832 - General Genetics

Introduces molecular, classical, developmental and population genetics. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096, and 2081/2098 with a C- or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 3840 - Independent Study

Note: Registration by special processing form only. Prereq: One year of general biology with a grade of "C-" or higher and permission of instructor; registration by special processing form only. Max hours: 6 Credits. **Semester Hours:** 1 to 3

BIOL 3939 - Internship

Designed experience involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

BIOL 4024 - Introduction to Biotechnology

Introduces aspects of biotechnology within a historical context, including medical, forensic, agricultural and microbial biotechnology. Addresses principles behind state-of-the-field techniques in recombinant DNA technology, bioinformatics, proteomics and genomics. Biotechnology regulations and ethics will also be discussed. Prereq: BIOL 3832 with a C- or higher. Cross-listed with BIOL 5024. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4050 - Advanced Biology Topics

Examines current topics in the field of biology. Topics vary from term to term. See Schedule Planner for current topics. Prereq: BIOL 2051/2095, 2061/2097, 2071/2096, and 2081/2098 with a C- or higher. Cross-listed with BIOL 5050. Max hours: 8 Credits. **Semester Hours:** 1 to 8

BIOL 4051 - Advanced Topics In Microbiology

An in-depth study of microbial concepts, including prokaryotic and eukaryotic structure and function; properties of

biological macromolecules; microbial growth kinetics; and microbial diversity. Emphasis is on one of the following: virology, microbial physiology, environmental microbiology, microbial biotechnology and nucleic acids. Prereq: BIOL 3654 with a grade of C- or higher. Cross-listed with BIOL 5051. Max hours: 6 Credits. **Semester Hours:** 3 to 3

BIOL 4052 - Advanced Ecology

This combination seminar and lecture course focuses on state-of-field knowledge, current theories and recent models in selected areas of ecology, such as theoretical ecology, evolutionary ecology, population biology and ecosystems ecology. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5052. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4053 - Disease Ecology

The study of the underlying principles that influence the spatio-temporal patterns of infectious disease in environments. Students will apply ecological theories about concepts such as biodiversity, trophic interactions, landscape structure, and nutrient cycling to the study of disease. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5053. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4054 - Developmental Biology

Covers gametogenesis, fertilization, cleavage and development of the embryo with an emphasis on the biochemical and biophysical aspects. Prereq: General cell biology with a grade of "C-" or higher. Cross-listed with BIOL 5054. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4064 - Advanced Cell Biology

Builds on the foundations laid in the prerequisite courses. Major topics include the functions of cell membranes, energy transduction and regulation of metabolic pathways. A major emphasis is the control and integration of cellular activities. Prereq: General cell biology and one semester of biochemistry with grades of "C-" or higher. Cross-listed with BIOL 5064. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4068 - The Cell Cycle

Provides an in-depth study of the molecular regulation of the eukaryotic cell cycle. Includes mitosis, meiosis, developmental cell cycles, cell cycle checkpoints and cell cycle defects in cancer. Prereq: Students must have completed BIOL 3611 and BIOL 3832 with a C- or higher in order to enroll in this course. Biochemistry strongly recommended. Cross-listed w/BIOL 5068. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4074 - Human Reproductive Biology

Comprehensive study of anatomy and physiology of human reproduction. Embryogenesis of male and female reproductive systems and detailed analysis of contraception, world population growth, population control and implications of population growth are also covered. Prereq: BIOL 3611 with a C- or higher. Cross-listed with BIOL 5074. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4125 - Molecular Biology Laboratory

Provides hands-on experiences in molecular biology and an appreciation for using the tools of molecular biology to study biological systems. Emphasis is placed on DNA cloning, PCR, mutagenesis and protein purification techniques. Experimental design and the theories underlying the techniques are also discussed. Prereq: BIOL 3124 with a C- or higher. Cross-listed with BIOL 5125. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4126 - Molecular Genetics

Examines molecular techniques and their application to experimental genetics, specifically organization and mapping of genomes, application and model systems in defining hereditary components of disease, and mechanisms of identifying mutations and their implications for disease. Also addresses application of recombinant DNA technology. Prereq: Completion of Introduction to Molecular Biology with a C- or higher is required in order for students to enroll in this course. Cross-listed with BIOL 5126. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4128 - Topics in Molecular Biology

Literature-based course examining the regulation of gene expression in eukaryotic systems, as well as contemporary recombinant DNA technology and applications of molecular cloning techniques. Prereq: BIOL 3124 with a C- or higher; biochemistry strongly recommended. Cross-listed with BIOL 5128. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4134 - Human Genetics

Advanced survey of the current status of the field. Emphasis on understanding, diagnosis and treatment of genetic disease and on the impact of molecular biology on human genetics. Prereq: General genetics with a grade of "C-" or higher. Cross-listed with 5134. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4144 - Medical Microbiology

Provides an understanding of the relationship between pathogenic organisms and their host. Emphasis is placed on the area of medical bacteriology, with attention given to mechanisms of pathogenesis, genetics of disease, serology and treatment. Prereq: general microbiology with a grade of "C-" or higher. Cross-listed with BIOL 5144. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4154 - Conservation Biology

Basic concepts and theories in ecology, population biology and genetics as they apply to issues relating to the preservation of biodiversity, such as the genetics of small populations, captive propagation, restoration ecology and the design of nature reserves. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5154. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4165 - Neurobiology

Overview of neuroscience, covering the cellular basis of neuronal activity, muscle, sensory structures and the structure and function of the human brain. Prereq: One year of general biology and general cell biology with grades of "C-" or higher. Cross-listed with BIOL 5165. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4250 - Mechanisms of Animal Behavior

The proximate and ultimate mechanisms of animal behavior are analyzed using comparative animal examples from the scientific literature. Proximate mechanisms include genetic and physiological processes. Ultimate mechanisms include the role of natural and sexual selection in the evolution of behavior. Prereq: One year of general biology with a grade of "C-" or higher. Genetics and human physiology are recommended. Cross-listed with BIOL 5250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4315 - Plant Systematics

Lecture, lab and field trips. Extensive introduction to the basic principles and concepts of vascular plant systematics. Topics include principles of taxonomy, nomenclature, methods, systems of classification and field and herbarium procedures. Emphasis on plant structure and identification using fresh, frozen and pressed plant specimens. Prereq: One year of general biology with a grade of "C-" or higher. Cross-listed with BIOL 5315. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 4335 - Plant Science

Lecture, lab and field trips. An in-depth study of flowering plants, including embryology, structure, function, reproduction, ecology and evolution of the group. Emphasis is placed upon morphology and anatomy at all stages of plant development. Prereq: One year of general biology (BIOL 2051, 2061, 2071, 2081) and General Cell Biology (BIOL 3611) with a grade of "C-" or higher. Cross-listed with BIOL 5335. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 4345 - Flora of Colorado

Lecture, lab and field trips. Introduces the vascular plant flora of Colorado, including ferns, gymnosperms and flowering plants. Emphasis on field identification of species representing a range of natural communities from grassland to alpine tundra, as well as non-natives. Field and herbarium techniques covered. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5345. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 4415 - Microbial Ecology

An in-depth study of ecology as it relates to microorganisms; abiotic and biotic interactions within microbial populations in macro- and microhabitats; and the role of microorganisms in maintaining steady state conditions in natural ecosystems. Emphasis is placed on how the ecology of microorganisms affects the human condition. Prereq: General microbiology with a grade of "C-" or higher. Cross-listed with BIOL 5415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4416 - Aquatic Ecology

This advanced ecology course examines the inter-relations of biological (including humans), physical and chemical components of wetlands, streams, rivers, lakes, reservoirs and groundwater. Learning is facilitated through lectures, discussions, student presentations, laboratory and field exercises. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5416. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4425 - Biogeography

An in-depth study of biological populations through analysis of geographic distribution patterns in space and time. Emphasis on how biogeography informs studies of evolution and ecology and on applied studies in conservation, sustainability, epidemiology, and disease dynamics. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5425. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4450 - Marine Biology

Looks at the fascinating organisms that inhabit the oceans, which represent 99% of the living space of earth. While the focus is on the ecology of marine organisms, taxonomy, physiology and anatomy are also covered. Prereq: One year of general biology with a grade of "C-" or higher. Cross-listed with BIOL 5450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4455 - Comparative Environmental Physiology

This advanced physiology course explores the physiological evolutionary adaptations of different animals in the context of their environment. Content includes exploration of maintenance of homeostasis via feedback regulation, structure-function relationships, cellular physiology, and the study of organ systems including the nervous, endocrine, respiratory, reproductive and cardiovascular systems. Prereq: Human or animal physiology with a grade of "C-" or higher. Cross-listed with BIOL 5455. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4460 - Environmental Toxicology

Text and literature-based course provides students with background knowledge concerning environmental toxins, the nature and extent of environmental contamination, and toxicant effects on individual organisms and populations. Prereq: Human Physiology with grades of "C-" or higher. Organic Chemistry and/or Biochemistry strongly recommended. Cross-listed with BIOL 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4464 - Exercise Physiology

This course addresses the dynamic physiological changes associated with exercise. Where human physiology addresses physiological processes at rest, this course explores how the cardiovascular, respiratory, nervous and endocrine systems support increased energy transfer as skeletal muscle becomes more active. Prereq: Human Physiology (BIOL 3225 or equivalent) with a grade of C- or higher. Cross-listed with BIOL 5464. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4474 - Ecological Methods

Deals with the empirical aspects of an ecological study. Students learn sampling techniques that are used in plant and animal ecology. Emphasis is placed on hypothesis testing, data analysis and experimental field designs. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5474. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 4475 - Mechanisms of Human Pathology

Studies physiological, cellular and biochemical processes in human diseases, with particular focus on non-communicable diseases such as diabetes, cardiovascular disease and diseases of aging such as osteoporosis and macular degeneration. Prereq: Human physiology with a grade of "C-" or higher; general cell biology or general microbiology strongly recommended. Cross-listed with BIOL 5475. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4494 - Population and Evolutionary Genetics

Introduces the genetic processes underlying evolutionary change in microbial, plant and animal populations. Topics include: sources of variation, Hardy-Weinberg equilibrium, population genetic structure, natural selection and other evolutionary forces, quantitative genetics and molecular phylogenetics. Emphasis on experimental data. Prereq: Completion of General Genetics and Introduction to Evolution with a C- or higher is required in order for students to enroll in this course. Cross-listed with BIOL 5494. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4550 - Cell Signaling

Lecture by faculty and student presentations cover mechanism of hormones and regulation of various cellular processes through second messenger systems. Prereq: General cell biology with a grade of "C-" or higher; one semester of biochemistry recommended. Cross-listed with BIOL 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4622 - Topics in Immunology

An in-depth study of immunological concepts. Topics will vary from semester to semester and may range from specifics of immune cell responses to tolerance and autoimmunity. Delivery will include lecture, student presentations, and discussion. Prereq: BIOL 3621 with a C- or higher. Cross-listed with BIOL 5622. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4634 - Biology of Cancer

Cancer is the second leading cause of death in the United States. This course offers an overview of recent research into the causes, treatments and possible prevention of cancer. Includes a detailed look at the mechanisms of action of various oncogenes. Prereq: General cell biology with a grade of 'C-' or higher; general genetics strongly recommended. Cross-listed with BIOL 5634. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4640 - Mammalogy

Lecture, laboratory, and required field trips. This course provides a general overview of the biology of mammals, including their diversity, distribution, economic importance, and other characteristics that make them of special interest

to humans. Coverage will be worldwide, with special emphasis placed on the mammals of Colorado. Prereq: One year of general biology with grades of 'C-' or higher and completion of the structure/ function core requirement with a grade of 'C-' or higher. Cross-listed with BIOL 5640. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 4644 - Advanced Human Anatomy Laboratory

Advanced laboratory course in human anatomy. In-depth look at the structural aspects of the human body, emphasizing function. Models, microscope slides, and visual media will supplement cadaver-based dissections. Prereq: One year of general biology and human anatomy with a grade of "C-" (2.0) or higher. Cross-listed with BIOL 5644. Max hours: 2 Credits. **Semester Hours:** 2 to 2

BIOL 4674 - Endocrinology

This systematic survey of the endocrine system looks at the cellular basis and biochemical characteristics of individual endocrine tissues. Their function in the regulation of other endocrinological, physiological, and behavioral events is analyzed. The course emphasizes the human system and complements studies in physiology, behavior and neurobiology. Prereq: Human physiology with a grade of "C-" or higher. Cross-listed with BIOL 5674. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4840 - Independent Study

Note: Registration by special processing form only. Prereq: One year of general biology with a grade of "C-" or higher and permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 6

BIOL 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOL 4910 - Field Studies

Field studies of individuals, populations and communities comprising a specified ecosystem. Emphasis on field identification of vascular plants and vertebrate animals. Topics include the physical environment, biotic and abiotic interactions, life history, ecological adaptations and biogeography. Note: Lectures and a week-long field trip. Prereq: Students must have completed BIOL 3411(Principles of Ecology) with a C- or higher, in order to enroll in this course. Cross-listed with BIOL 5910. Max hours: 6 Credits. **Semester Hours:** 3 to 3

BIOL 4974 - Evolution

A capstone course that draws upon concepts from all fields of biology. Topics include the fossil record, mass extinctions, the historical development of the modern synthesis, principles and mechanisms of evolution, current viewpoints and controversies. Prereq: BIOL 3445 and 3832 with a C- or higher. Cross-listed with BIOL 5974. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 4990 - Undergraduate Research Seminar

Introduces research in the biological sciences. Students read current scientific literature, attend related seminars and participate in discussions. This course offers students a chance to interact with visiting scientists, who will present state-of-the-field biological research in a seminar setting. Prereq: Senior standing, satisfactory completion of all biology core courses, overall GPA of 3.0 or higher and permission of instructor. Cross-listed with BIOL 6655. Max hours: 1 Credit. **Semester Hours:** 1 to 1

BIOL 5001 - Cells, Human Systems and Heredity

Systematic study of key concepts in cell structure and function; energy transformations in living systems, functioning of human systems in health or disease, patterns or process of human inheritance and biotechnology impacts on human society. Concepts are linked to other scientific, mathematical, societal and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Restriction: Restricted to degree-granting graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5002 - RM-MSMSP: Ecology, Biodiversity and Adaptation

Systematic study of biological concepts including ecosystems, population dynamics, food chains, biodiversity and evolutionary processes. Instruction is inquiry-based and interactive. Concepts are linked to other scientific, mathematical, societal and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Restriction: Restricted to degree-granting graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5003 - RM-MSMSP: The Biology of Life: Integrated Perspectives

Uses an integrated approach to investigate current biological, ecological and environmental issues including biofuels, climate change, red tides, coral bleaching, biomagnifications of toxins, acid rain and population growth. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Restriction: Restricted to degree-granting graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5004 - Research Experience for Teachers - Biology Cohort

The Research Experience for Teachers (RET) program is a five-week research exploration in which twelve RM-MSMSP teachers will raise their level of relevant scientific understanding by engaging in a 'hands on' workshop, transforming what they have learned into new curricular materials that will improve the scientific abilities of their students and hopefully stimulate them to consider a STEM career. Note: This course is not applicable toward any degree in the College of Liberal Arts & Sciences. Restriction: Restricted to degree-granting graduate programs. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOL 5024 - Introduction to Biotechnology

Introduces aspects of biotechnology within a historical context, including medical, forensic, agricultural and microbial biotechnology. Addresses principles behind state-of-the-field techniques in recombinant DNA technology, bioinformatics, proteomics and genomics. Biotechnology regulations and ethics will also be discussed. Restriction:

Restricted to degree-granting graduate programs. Cross-listed with BIOL 4024. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5050 - Advanced Biology Topics

Examines current topics in the field of biology. Topics vary from term to term. See Schedule Planner for current topics. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4050. Max hours: 9 Credits. **Semester Hours:** 1 to 8

BIOL 5051 - Advanced Topics In Microbiology

An in-depth study of microbial concepts, including prokaryotic and eukaryotic structure and function; properties of biological macromolecules; microbial growth kinetics; and microbial diversity. Emphasis is on one of the following: virology, microbial physiology, environmental microbiology, microbial biotechnology and nucleic acids. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4051. Max hours: 6 Credits. **Semester Hours:** 3 to 3

BIOL 5052 - Advanced Ecology

This combination seminar and lecture course focuses on state-of-field knowledge, current theories and recent models in selected areas of ecology, such as theoretical ecology, evolutionary ecology, population biology and ecosystems ecology. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4052. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5053 - Disease Ecology

The study of the underlying principles that influence the spatio-temporal patterns of infectious disease in environments. Students will apply ecological theories about concepts such as biodiversity, trophic interactions, landscape structure, and nutrient cycling to the study of disease. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4053. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5054 - Developmental Biology

Covers gametogenesis, fertilization, cleavage and development of the embryo with an emphasis on the biochemical and biophysical aspects. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4054. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5064 - Advanced Cell Biology

Builds on the foundations laid in the prerequisite courses. Major topics include the functions of cell membranes, energy transduction and regulation of metabolic pathways. A major emphasis is the control and integration of cellular activities. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4064. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5068 - The Cell Cycle

Provides an in-depth study of the molecular regulation of the eukaryotic cell cycle. Includes mitosis, meiosis, developmental cell cycles, cell cycle checkpoints and cell cycle defects in cancer. Restriction: Restricted to degree-granting graduate programs. Cross-listed w/BIOL 4068. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5074 - Human Reproductive Biology

Comprehensive study of anatomy and physiology of human reproduction. Embryogenesis of male and female reproductive systems and detailed analysis of contraception, world population growth, population control and implications of population growth are also covered. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4074. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5099 - Biology For Computer Scientists, Engineers and Mathematicians

Designed to give a foundation in molecular biology for work in the field of computational biology or bioinformatics. The goal of this new field is to provide predictive capability for diagnosing disease and discovering therapeutics. Prereq: Students interested in enrolling in this course should have a strong background in science, engineering, mathematics or a related discipline. Restriction: Restricted to degree-granting graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5125 - Molecular Biology Lab

Provides hands-on experiences in molecular biology and an appreciation for using the tools of molecular biology to study biological systems. Emphasis is placed on DNA cloning, PCR, mutagenesis and protein purification techniques. Experimental design and the theories underlying the techniques are also discussed. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4125. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5126 - Molecular Genetics

Examines molecular techniques and their application to experimental genetics, specifically organization and mapping of genomes, application and model systems in defining hereditary components of disease, and mechanisms of identifying mutations and their implications for disease. Also addresses application of recombinant DNA technology. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4126. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5128 - Topics in Molecular Biology

Literature-based course examining the regulation of gene expression in eukaryotic systems, as well as contemporary recombinant DNA technology and applications of molecular cloning techniques. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4128. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5134 - Human Genetics

Advanced survey of the current status of the field. Emphasis on understanding, diagnosis and treatment of genetic disease and on the impact of molecular biology on human genetics. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4134. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5144 - Medical Microbiology

Provides an understanding of the relationship between pathogenic organisms and their host. Emphasis is placed on the area of medical bacteriology, with attention given to mechanisms of pathogenesis, genetics of disease, serology and treatment. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4144. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5154 - Conservation Biology

Basic concepts and theories in population biology and genetics as they apply to issues relating to the preservation of biodiversity, such as the genetics of small populations, captive propagation, restoration ecology and the design of nature reserves. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4154. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5165 - Neurobiology

Overview of neuroscience, covering the cellular basis of neuronal activity, muscle, sensory structures and the structure and function of the human brain. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4165. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5250 - Mechanisms of Animal Behavior

The proximate and ultimate mechanisms of animal behavior are analyzed using comparative animal examples from the scientific literature. Proximate mechanisms include genetic and physiological processes. Ultimate mechanisms include the role of natural and sexual selection in the evolution of behavior. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5315 - Plant Systematics

Lecture, lab and field trips. Extensive introduction to the basic principles and concepts of vascular plant systematics. Topics include principles of taxonomy, nomenclature, methods, systems of classification and field and herbarium procedures. Emphasis on plant structure and identification using fresh, frozen and pressed plant specimens. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4315. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5330 - Evolution and Diversification of Plants

Surveys the diverse assemblage of green algae and land plants. Ecological and evolutionary principles are used to interpret patterns of form and function within the context of their phylogeny as revealed from molecular systematics. Restriction: Restricted to degree-granting graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5335 - Plant Science

Lecture, lab and field trips. An in-depth study of flowering plants, including embryology, structure, function, reproduction, ecology and evolution of the group. Emphasis is placed upon morphology and anatomy at all stages of plant development. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4335. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5345 - Flora of Colorado

Lecture, lab and field trips. Introduces the vascular plant flora of Colorado, including ferns, gymnosperms and flowering plants. Emphasis on field identification of species representing a range of natural communities from grassland to alpine tundra, as well as non-natives. Field and herbarium techniques covered. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4345. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5415 - Microbial Ecology

An in-depth study of ecology as it relates to microorganisms; abiotic and biotic interactions within microbial populations in macro- and microhabitats; and the role of microorganisms in maintaining steady state conditions in natural ecosystems. Emphasis is placed on how the ecology of microorganisms affects the human condition. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5416 - Aquatic Ecology

This advanced ecology course examines the inter-relations of biological (including humans), physical and chemical components of wetlands, streams, rivers, lakes, reservoirs and groundwater. Learning is facilitated through lectures, discussions, student presentations, laboratory and field exercises. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4416. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5425 - Biogeography

An in-depth study of biological populations through analysis of geographic distribution patterns in space and time. Emphasis on how biogeography informs studies of evolution and ecology and on applied studies in conservation, sustainability, epidemiology, and disease dynamics. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4425. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5445 - Applied Environmental Biology

Examines the reciprocal relationships of organisms and the environment at scales from microbes to ecosystems. Explores the impact of human-caused perturbations on organisms as well as the impact of living systems on the flow of energy and materials (natural and man-made) through the environment. Restriction: Restricted to degree-granting graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5450 - Marine Biology

Looks at the fascinating organisms that inhabit the oceans, which represent 99% of the living space of earth. While the focus is on the ecology of marine organisms, taxonomy, physiology and anatomy are also covered. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5455 - Comparative Environmental Physiology

This advanced physiology course explores the physiological evolutionary adaptations of different animals in the context of their environment. Content includes exploration of maintenance of homeostasis via feedback regulation, structure-function relationships, cellular physiology, and the study of organ systems including the nervous, endocrine, respiratory, reproductive and cardiovascular systems. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4455. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5460 - Environmental Toxicology

Text and literature-based course provides students with background knowledge concerning environmental toxins, the nature and extent of environmental contamination, and toxicant effects on individual organisms and populations. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5464 - Exercise Physiology

This course addresses the dynamic physiological changes associated with exercise. Where human physiology addresses physiological processes at rest, this course explores how the cardiovascular, respiratory, nervous and endocrine systems support increased energy transfer as skeletal muscle becomes more active. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4464. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5474 - Ecological Methods

Lecture, laboratory. Deals with the empirical aspects of an ecological study. Students learn sampling techniques that are used in plant and animal ecology. Emphasis is placed on hypothesis testing, data analysis and experimental field designs. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4474. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5475 - Mechanisms of Human Pathology

Studies physiological, cellular and biochemical processes in human diseases, with particular focus on non-communicable diseases such as diabetes, cardiovascular disease and diseases of aging such as osteoporosis and macular degeneration. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4475. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5494 - Population and Evolutionary Genetics

Introduces the genetic processes underlying evolutionary change in microbial, plant and animal populations. Topics

include: sources of variation, Hardy-Weinberg equilibrium, population genetic structure, natural selection and other evolutionary forces, quantitative genetics and molecular phylogenetics. Emphasis on experimental data. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4494. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5550 - Cell Signaling

Lecture by faculty and student presentations cover mechanism of hormones and regulation of various cellular processes through second messenger systems. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5621 - Immunology

Studies antibody-antigen interactions, the immune system, inflammation, hypersensitivity, autoimmunity, and recovery from infection. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4621. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5622 - Topics in Immunology

An in-depth study of immunological concepts. Topics will vary from semester to semester and may range from specifics of immune cell responses to tolerance and autoimmunity. Delivery will include lecture, student presentations, and discussion. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4622. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5634 - Biology of Cancer

Cancer is the second leading cause of death in the United States. This course offers an overview of recent research into the causes, treatments and possible prevention of cancer. Includes a detailed look at the mechanisms of action of various oncogenes. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4634. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5640 - Mammalogy

Lecture, laboratory, and required field trips. This course provides a general overview of the biology of mammals, including their diversity, distribution, economic importance, and other characteristics that make them of special interest to humans. Coverage will be worldwide, with special emphasis placed on the mammals of Colorado. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4640. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 5644 - Advanced Human Anatomy Laboratory

Advanced laboratory course in human anatomy. In-depth look at the structural aspects of the human body, emphasizing function. Models, microscope slides, and visual media will supplement cadaver-based dissections. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4644. Max hours: 2 Credits. **Semester Hours:** 2 to 2

BIOL 5674 - Endocrinology

This systematic survey of the endocrine system looks at the cellular basis and biochemical characteristics of individual endocrine tissues. Their function in the regulation of other endocrinological, physiological, and behavioral events is analyzed. The course emphasizes the human system and complements studies in physiology, behavior and neurobiology. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4674. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5705 - Biological Research Workshop

For graduate and advanced undergraduate students who are directly engaged in original research. Provides introduction to the discovery dissemination and peer review process associated with writing research proposals, manuscripts, and grants, as well as poster and oral presentations. Students will workshop each other's original research. Graduate students enroll in 6705; research-active undergraduates enroll in 5705. Cross-listed with BIOL 6705. Prereq: Students involved in original research. Restriction: Restricted to degree-granting graduate programs. Max hours: 2 Credits. **Semester Hours:** 2 to 2

BIOL 5840 - Independent Study: BIOL

Note: Registration by special processing form only. Restriction: Restricted to degree-granting graduate programs. Max hours: 12 Credits. **Semester Hours:** 1 to 3

BIOL 5910 - Field Studies

Field studies of individuals, populations and communities comprising a specified ecosystem. Emphasis on field identification of vascular plants and vertebrate animals. Topics include the physical environment, biotic and abiotic interactions, life history, ecological adaptations and biogeography. Note: Lectures and a week-long field trip. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4910. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 5939 - Internship

Designed experience involving application of specific, relevant concepts and skills in supervised employment situations. Restriction: Restricted to degree-granting graduate programs. Max hours: 9 Credits. **Semester Hours:** 1 to 6

BIOL 5974 - Evolution

A capstone course that draws upon concepts from all fields of biology. Topics include the fossil record mass extinctions, the historical development of the modern synthesis, principles and mechanisms of evolution, current viewpoints and controversies. Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4974. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 6002 - Biology Skills Sets - Pedagogy

The purpose is to introduce sound practice in teaching and innovation in pedagogy. Topics covered will include assessment techniques, creation of learning goals, and research methods in biological education. Restriction: Restricted to degree-granting graduate programs. Max hours: 1 Credit. **Semester Hours:** 2 to 2

BIOL 6655 - Seminar

Restriction: Restricted to degree-granting graduate programs. Cross-listed with BIOL 4990. Max hours: 2 Credits. **Semester Hours:** 1 to 1

BIOL 6705 - Biological Research Workshop

For graduate and advanced undergraduate students who are directly engaged in original research. Provides introduction to the discovery dissemination and peer review process associated with writing research proposals, manuscripts, and grants, as well as poster and oral presentations. Students will workshop each other's original research. Graduate students enroll in 6705; research-active undergraduates enroll in 5705. Cross-listed with BIOL 5705. Prereq: Students involved in original research and permission of instructor. Restriction: Restricted to degree-granting graduate programs. Max hours: 8 Credits. **Semester Hours:** 2 to 2

BIOL 6764 - Biological Data Analysis

Addresses quantitative aspects of research design, data collection and analysis in the biological sciences. Emphasizes relationships among probability theory, estimation, testing, inference, and interpretation. Includes intensive computer lab using the statistical programming software R to demonstrate both traditional analytical and contemporary simulation based (permutation, bootstrap, and Bayesian) approaches for inference in biology. Restriction: Restricted to degree-granting graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

BIOL 6880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Restriction: Restricted to degree-granting graduate programs. Max hours: 6 Credits. **Semester Hours:** 1 to 6

BIOL 6950 - Master's Thesis

Restriction: Restricted to degree-granting graduate programs. Max hours: 9 Credits. **Semester Hours:** 1 to 8

BIOL 7010 - Integrative and Systems Biology

Addresses current research problems in integrative biology and system biology by surveying the peer-reviewed literature. Particular attention will be paid to research topics that integrate multiple levels of biological organization and that investigate how properties of systems emerge from interactions of sub-units. Note: New students in the Integrative and Systems Biology PhD program will enroll in this course during their first year. Restriction: Restricted to degree-granting graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BIOL 7050 - Special Topics

Readings in current biology topics. Specific topics vary and may be proposed by groups of graduate students who identify a suitable faculty instructor or by a faculty member who identifies a need for advanced study in a specialized topic of biology. Restriction: Restricted to degree-granting graduate programs. Max hours: 6 Credits. **Semester Hours:** 1 to 3

BIOL 7650 - Research in Integrative and Systems Biology

Designed to allow doctoral students to conduct research for course credit prior to advancement to candidacy. Prereq: Ph.D. student and permission of instructor. Restriction: Restricted to degree-granting graduate programs. Max hours: 10 Credits. **Semester Hours:** 1 to 10

BIOL 7920 - Directed Reading/Grant Writing

Allows students to examine current literature related to their specialty area of biological research and to work in collaboration with a research mentor to develop a grant-based dissertation proposal in preparation for the comprehensive review examination. Prereq: Students must be in the Integrative and Systems Biology PhD program and have permission from the instructor. Restriction: Restricted to degree-granting graduate programs. Max hours: 9 Credits. **Semester Hours:** 3 to 3

BIOL 8990 - Doctoral Dissertation

Designed to allow doctoral students to conduct research for course credit prior to advancement to candidacy. Prereq: Students must be in the Integrative and Systems Biology PhD program and have permission from the instructor. Restriction: Restricted to degree-granting graduate programs. Max hours: 60 Credits. **Semester Hours:** 1 to 10

BIOL 9000 - INTC: Special Topics

Restriction: Restricted to degree-granting graduate programs. Max hours: 10 Credits. **Semester Hours:** 1 to 10

BLAW 3000 - Legal and Ethical Environments of Business I

Addresses the most fundamental ways the legal and ethical environments of business affect managers. Students are taught to identify legal issues, make ethical judgments about business conduct, and understand the ways ethical and social issues are developed. Topics include actual analysis of legal and ethical issues, ethical theory and its application, law-making processes, contracts, torts, product liability, criminal law, constitutional law and real property. This is a business core course therefore a grade of "C" or better must be earned to satisfy Business graduation requirements and prerequisites for other business courses. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BLAW 3050 - Business Law and Ethics

Students are taught to identify & resolve legal and ethical issues. Topics include contracts, torts, criminal law, constitutional law, business organizations, employment law, intellectual property and real property law. This is a business core course therefore a grade of "C" or better must be earned to satisfy Business graduation requirements. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BLAW 3100 - Legal and Ethical Implications of Risk

Topics include contracts, torts, constitutional law, intellectual property, agency, business organizations, employment law, and real property law. Special focus is placed on the relationship between insurance and risk and the topics covered. May be taken in lieu of BLAW 3050. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BLAW 4120 - Legal Issues for Entrepreneurs

Skills in legal and factual analysis and the application of ethical theories are addressed with an emphasis on applicability for entrepreneurs. The cases are drawn from a variety of functional areas such as accounting, information systems, finance, management, marketing and production. Topics include securities, venture capital, employment law and consumer law. Cross-listed with ENTP 3120. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BLAW 4121 - Legal and Ethical Implications of Risk

Skills in legal and factual analysis and the application of ethical theories are advanced and refined through cases. Topics: insurance law, personal property and intellectual property law, agency, business entities, securities, employment law, and consumer law. Focus is placed on the relationship between insurance, risk and the covered topics. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BLAW 4140 - Negotiation Skills/Property: Effective Strategies

Course covers real and personal property law, including ownership, title, landlord/tenant, easements, environmental law, and zoning. Emerging issues in intellectual property are also reviewed, including U. S. law and international treaties and agreements. Negotiation techniques through role-playing are emphasized. NOTE: This course is an elective course and may not be used to fulfill the CORE BLAW 3050 course. Meets concurrently with MGMT 4140. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BLAW 6500 - Legal Issues for CPA's

Examines advanced legal issues affecting accounting financial reporting. Designed for graduate students who want to understand and improve the links between accounting disclosures and legal requirements. Note: This class is rarely offered. Prereq: BLAW 3000 or BUSN 6540 (or equivalent). Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BMIN 1000 - Introduction to Business

The business and economic landscape is introduced illustrating the challenges and opportunities in today's business environment. A foundation in traditional business disciplines is introduced including the principles and terminology employed in Marketing, Management, Finance, Accounting, Operations, and Economics. This course is cross-listed with MGMT 1000. Restriction: Students enrolled in the Business School are not eligible for this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BMIN 3001 - Fundamentals of Management, Marketing, and Operations

Comprised of three modules focusing on essential concepts of 1) Management, including organizational behavior, leadership, management methods and team-based work, 2) Marketing, including buyer behavior analysis, marketing research, planning and implementation and the marketing mix of product, price, distribution and promotion and 3) Operations, including planning, production and inventory control, and quality management in both goods and services environments. Restriction: Students enrolled in the Business School are not eligible for this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BMIN 3002 - Fundamentals of Accounting, Finance, & Data Driven Analysis

Comprised of three modules focusing on essential concepts of 1) Accounting, including the use of information in financial reports and the use of other financial data used in making business decisions, 2) Finance, including financial markets, capital structure, time-value of money, valuation and capital budgeting and 3) Data driven analysis, including techniques for summarizing, analyzing and reporting data. Restriction: Students enrolled in the Business School are not eligible for this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BMIN 3003 - Essential Skills for Today's Workplace

According to business leaders, communication skills are some of the most important skills employees can have, yet they are often the skills many employees are lacking. This course is comprised of two modules focusing on specific skill sets that will help students set themselves apart from others in the workplace: 1) Business Communication and Presentation Skills including an introduction to effectively implementing computer-based application tools; and 2) Career and Professional Development topics including career investigation and targeting, resume optimization, LinkedIn profile and network development, networking, interviewing, and business etiquette. Restriction: Students enrolled in the Business School are not eligible for this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BMIN 3004 - Innovation, Strategy, and Business Planning

Students will examine the critical issues involved in developing and running successful businesses. Using the business lifecycle model as a framework, pre-launch, post launch, growth, and maturity issues will be examined. These include ideation and opportunity analysis, value creation, mission and vision, internal and external analysis, leadership, and strategic growth. The course synthesizes key concepts from other Business Minor courses including accounting, finance, management, and marketing, and introduces the concepts of sustainability and corporate social responsibility. Restriction: Students enrolled in the Business School are not eligible for this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 1110 - Intro to Investment Services Careers

Open to all majors! Provides a comprehensive overview of careers in the Investment Services industry. Emphasis will be on interactions with industry professionals to provide hands-on knowledge and opportunities for in-depth discussion. Students are required to participate in a site visit to an investment services company during the course. Max hours: 1 Credit. **Semester Hours:** 1 to 1

BUSN 5939 - Internship

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 9 Credits. **Semester Hours:** 1 to 3

BUSN 6520 - Leading Individuals and Teams

Students learn the strengths and weaknesses of their management style and how to work effectively with individual differences. Students also learn how to form teams around purpose/task, diagnose problems and identify and implement solutions by utilizing leadership skills such as setting goals, processes and measures, interpersonal communication, motivation and conflict management. Students develop an understanding of the effect of the organizational and social context on the behavior of individuals and teams. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6521 - Leading Individuals and Teams

Students learn the strengths and weaknesses of their management style and how to work effectively with individual differences. Students also learn how to form teams around purpose/task, diagnose problems and identify and implement solutions by utilizing leadership skills such as setting goals, processes and measures, interpersonal communication, motivation and conflict management. Students develop an understanding of the effect of the organizational and social context on the behavior of individuals and teams. The emphasis is on health care issues and is intended for health care students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6530 - Data Analysis for Managers

Provides an overview of techniques for data analysis, including multiple regression, sampling theory and applications of probabilistic inference from sample data. The emphasis is upon the applications of these techniques to management problems. Students are required to analyze data sets, present their analyses in written or oral form and defend their conclusions. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6540 - Legal and Ethical Environment of Business

Students develop a working knowledge of legal and ethical parameters for business decision making. The course addresses the legal system and mechanisms for resolving disputes. Topics include constitutional law, torts, product liability, contracts, property law, consumer protection, intellectual property, business entities and employment law. It stresses the influence of legal issues on organizational decision making. Note: Students can substitute ENTP 6822 but credit cannot be received for both. Health Administration students must take BUSN 6541. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6541 - Legal and Ethical Environment of Business (Health Section)

Students develop a working knowledge of legal and ethical parameters for business decision making. Addresses the legal system and mechanisms for resolving disputes. Topics include business entities, torts, contracts, employment relationships, litigation and alternative dispute resolution. It stresses the influence of legal issues on organization and decision making. The emphasis is on health care issues and is intended for health care students. Max hours: 3 Credits.

Semester Hours: 3 to 3

BUSN 6550 - Analyzing and Interpreting Accounting Information

Emphasizes the use of accounting statements and data in making business decisions. External financial accounting information and concepts are used for investment and credit decisions. Internal managerial accounting information and concepts are used for product costing, cost analysis and management control. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester**

Hours: 3 to 3

BUSN 6560 - Marketing Management

Focuses on the formulation and implementation of a marketing plan in the context of the firm's strengths, overall strategy and competitive environment. Emphasis is on understanding the marketing environment and on decision making skills regarding market selection, pricing, promotion, product configuration and management of distribution channels. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6561 - Marketing Management (Health Section)

Focuses on the formulation and implementation of a marketing plan in the context of the firm's strengths, overall strategy and competitive environment. Emphasis is on understanding the marketing environment and on decision making skills regarding market selection, pricing, promotion, product configuration and management of distribution channels. Restrictions: Restricted to HLAD and MBAH majors within the Business School. Max hours: 3 Credits.

Semester Hours: 3 to 3

BUSN 6610 - Information Systems Management and Strategy

Examines the strategic, technological, financial and organizational issues involved with the effective management of information technology. Topics include: (1) role and importance of IT in modern organizations (e.g., IT impact on competitiveness, alignment of corporate and IT strategies, IT infrastructures and IT-enabled organizational processes), (2) alternative methods to develop, acquire and implement information systems (e.g.) evaluation of IT investments, implementing and managing complex IT projects), (3) nature of IT management (e.g., the evolving roles of enterprise IT management, IT sourcing and contractual relationships) and (4) ethical and security issues associated with IT. Note: Students cannot receive credit if they have taken BUSN 6810 or ISMG 6180. Cross-listed with ISMG 6180.

Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6620 - Applied Economics for Managers

After taking this course, students should be able to apply economic principles to make optimal decisions given firm cost, demand and market circumstances. Also, they should be able to analyze the firms interactions with its competitive market environment. Students will learn basic aspects of federal macroeconomic policy designed to achieve stable prices and economic growth. Also, they will learn to understand the measurement of output (GDP), employment and prices; the conduct of monetary and fiscal policy; and the balance of trade. Coreq: BUSN 6550 and BUSN 6530 or FNCE 6290 or BANA 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6621 - Applied Economics for Managers (Health Section)

After taking this course, students should be able to apply economic principles to make optimal decisions given firm cost, demand and market circumstances. Also, they should be able to analyze the firm's interactions with its competitive market environment. Students should understand basic aspects of federal macroeconomics policy designed to achieve stable prices and economic growth. Also, they should understand basic aspects of government regulation of business. The emphasis is on healthcare issues and is intended for healthcare students. Coreq: BUSN 6550 and BUSN 6530 or FNCE 6290 or BANA 6610 Restrictions: Restricted to HLAD and MBAH majors within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6630 - Management of Operations

This course is concerned with the production and delivery of goods and services. It provides an overview of a variety of key Operation Management issues including scheduling, capacity determination, facility location and layout, distribution and related topics. The use of model-assisted decision making is emphasized. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6640 - Financial Management

This course is concerned with the business firm's decisions to make investments and to finance its operations. Students learn to use the tools and theories underlying business valuation, cost of capital, capital budgeting and capital structure. Students will learn to evaluate a firm's financial position through the examination of its financial statements and to prepare pro forma statements for the firm. Prereq: BUSN 6550 with a grade of C or better. Coreq: BUSN 6530 or FNCE 6290 or BANA 6610 and BUSN 6620 or BUSN 6621. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6710 - Strategic Management

Concerned with the development of a general management perspective in establishing the strategic direction for an enterprise. Students gain an understanding of strategy formulation and implementation within the context of the global environment. Emphasis is on the integration of knowledge acquired in the previous functional area courses. Note: This course is intended as a final semester Capstone course. Prereq: BUSN 6560 or 6561 and BUSN 6640 with a grade of C (2.0) or higher. Coreq: BUSN 6630. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or NBD within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6711 - Strategic Management (Health Section)

Concerned with the development of a general management perspective in establishing the strategic direction for a health delivery organization. Students gain an understanding of strategy formulation and implementation within the context of the managed care environment. Emphasis is on the integration of knowledge acquired in the previous functional area courses. Note: This course is intended as a final semester course. Required of Health Administration majors. Prereq: BUSN 6560 or BUSN 6561 and BUSN 6640 all with a grade of C (2.0) or higher. Restrictions: Restricted to HLAD and MBAH majors within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6800 - Topics In Business

Current topics in business are occasionally offered. Prerequisites vary depending on the material covered. Consult the current 'schedule planner' for specific offerings and prerequisites. Max hours: 12 Credits. **Semester Hours:** 3 to 3

BUSN 6807 - Analyzing Emerging Opps & Planning During Uncertain Time

To develop strategic thinking and practical planning skills. Prepare students for the dynamic and uncertain business environment today. More specifically, we explore how to think innovatively and spot trends, develop formal business plans around emerging opportunities, address uncertain and volatile situations using scenarios. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6811 - IT and New Business Paradigms

Introduces graduate students to the relationship between information technology and the other functional areas of the business. During the course, students have an opportunity to listen and learn from guest speakers who have been involved with either guiding or interpreting the impact of information technology among functional areas of existing or new business. Through the use of current readings, guest lectures and case analysis, students examine various models of IT and new business paradigms to determine the decisions and success criteria for integrating IT in ongoing business. A unique feature of the class will be the opportunity for students to present proposals and projects to be critiqued by individuals with IT or business experience. Those individuals provide feedback and perspectives regarding potential IT or new business paradigm activities. Prereq: Permission of instructor. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6812 - Business Intelligence and Analytics

Covers technical and managerial issues associated with the development and the use of decision support systems, expert systems, impacts and the future of MSS are discussed. The DSS component covers decision theory, model management, and business intelligence with an emphasis on how decision-making can be supported using data warehouses, OLAP, and data mining and visualization tools. The ES component focuses on knowledge acquisition, representation, reasoning, and using advanced intelligent systems over the web. In addition, collaboration, communication, enterprise decision support systems integration, impacts, and the future of MSS are discussed. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6830 - Business and the Natural Environment

Considers the impact of economic activity on the natural environment and the regulatory, market and corporate voluntary responses to reducing this impact. Topics: externalities, life cycle assessment, closed-loop systems, DfE (Design for the Environment), corporate sustainability reporting, and effective corporate sustainability strategies. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6840 - Independent Study

Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 8 Credits. **Semester Hours:** 1 to 3

BUSN 6860 - Finance in the Sports Entertainment Industries

This course explores the problems and solutions of financing in sports and entertainment business. It focuses on stadium/venue financing, sports team valuation, entertainment event guarantee estimation, player/artist salary issues and managing disparate revenue streams. The course utilizes speakers, articles, problem sets and cases. Prereq: BUSN 6640. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

BUSN 6870 - Global Climate Change

Global climate change may be one of the most important challenges facing business in the 21st century. This course will introduce the potential impacts of climate, then discuss possible regulatory responses to and business risks and opportunities that may emerge if climate change occurs. Cross-listed with INTB 6870. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CAND 5940 - Candidate for Degree

Max hours: 0 Credits. **Semester Hours:** 0 to 0

CHEM 1000 - Foundations for General Chemistry

This is a lecture- only course intended for students pursuing a degree in science or a health-related field. The course is designed for students who have never had a chemistry course or who have not taken general chemistry in 5+ years. Topics include the classification of matter, the Metric system, dimensional analysis, atomic theory and the structure of atoms, periodic relationships, energy and temperature, gas laws and the kinetic molecular theory, compounds and nomenclature of inorganic compounds, the mole, stoichiometry, types of chemical reactions, balancing equations, electron configurations, and chemical bonding. Enrollment in this course is strongly encouraged prior to enrollment in Chem 2031 if the student does not have a strong and recent background in general chemistry. Note: College Algebra or the equivalent is strongly recommended for optimal student success. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

CHEM 1115 - Chemistry Content

Covers content areas of undergraduate chemistry. Topics include periodicity; the mole and chemical bonding; the kinetic theory and states of matter; chemical reactions; solutions and chemical equilibria. Max hours: 3 Credits.

Semester Hours: 1 to 3

CHEM 1130 - Engineering General Chemistry

A one-semester non-laboratory version of general chemistry for engineers and those science majors who do not require laboratory credit and do not plan to take a second semester of chemistry. Prereq: One year of high school chemistry or CHEM 1000 and MATH 1110 (or high school equivalent) are strongly recommended for optimal student success. Max hours: 5 Credits. **Semester Hours:** 5 to 5

CHEM 1474 - Core Chemistry: Chemistry For the Consumer

Focuses on the common household chemicals that affect US on a daily basis. Students learn the underlying chemistry of nuclear power, sunscreens, food, cleaning agents, etc. Home-based laboratory experiments with safe, common substances. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 4 to 4

CHEM 2031 - General Chemistry I

This is the first of a two semester sequence designed for students pursuing a degree in science or a health related field. Chem 2031 is designed for students who have recently completed high school chemistry or Chem 1000 with a C- or better. Note: Non- science majors should review the course description for Chem 1474 as an alternative, non-majors science CU Denver Undergraduate Core course, with lab credit. Topics covered include the classification of matter, the Metric system, dimensional analysis, atomic theory and the structure of atoms, periodic relationships, empirical formulas, thermochemistry, gas laws and the kinetic molecular theory, compounds and nomenclature of inorganic compounds, the mole, balancing equations, stoichiometry, types of chemical reactions, solution stoichiometry and dilutions, electron configurations, chemical bonding, Lewis Dot Theory, Valence Shell Electron Pair repulsion Theory, and other topics as time allows. This course is a prerequisite or co-requisite for General Chemistry 1 Lab, Chem 2038. No co-credit with CHEM 2081. Note: a beginning course for science majors, medical technologists, pre-medical and pre-dental students. It is strongly recommended that students have taken CHEM 1000 and MATH 1110 or their high school equivalents to be adequately prepared to succeed in this course. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 3 to 3

CHEM 2038 - General Chemistry Laboratory I

Laboratory course designed to accompany Chem 2031. Topics include gravimetric analysis, statistical analysis, stoichiometry, Avogadro's number, thermochemistry, atomic spectroscopy, paper chromatography, and gas laws. No co-credit with CHEM 2088. Coreq: CHEM 2031. Max hours: 1 Credit. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

CHEM 2061 - General Chemistry II

This is a continuation of Chem 2031 and is the second course of a two semester sequence designed for students pursuing a degree in science or a health related field. CHEM 2061 builds upon the understanding of chemistry rooted in the molecular nature of matter and change from General Chemistry I and expands to include topics such as intermolecular forces, solution chemistry, kinetics, chemical equilibrium, acid-base chemistry, buffer chemistry, solubility, thermodynamics and time permitting, electrochemistry. Specific topics include: the use of bonding theories to explain the relationships between atomic structure, molecular shape, and macroscopic properties of matter including boiling point, vapor pressure, surface tension, viscosity, and capillarity; the understanding of molecular structure to explain the energetics of solution formation as well as vapor pressures of pure liquids and solutions; the application of rates of reactions to define the state of equilibrium; the application of problem solving techniques for systems at equilibrium to acid/base and solubility chemistry; and the thermodynamic underpinnings of chemical reaction rates and the spontaneous conversion of chemical species to attain a state of dynamic equilibrium. This course is a prerequisite or co-requisite for General Chemistry II Lab, Chem 2068. Prereq: CHEM 2031 or 2081 with a C- or higher. No co-credit with CHEM 2091. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 3 to 3

CHEM 2068 - General Chemistry Laboratory II

Students gain experience with laboratory technique and elementary chemical instrumentation. Note: Laboratory to accompany CHEM 2061 and a continuation of CHEM 2038. Prereq: CHEM 2038 or 2088. Coreq: CHEM 2061 or 2091. No co-credit with CHEM 2098. Max hours: 2 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 2 to 2

CHEM 2081 - Honors General Chemistry I

Topics include gas laws, thermochemistry, the quantum mechanical model of the atom, periodic properties, bonding and molecular geometry and intermolecular forces. Prepares students to take upper division chemistry courses. Honors section: Course assumes knowledge of stoichiometry and basic atomic structure. Note: Students may not receive credit for this course if they have already received credit for CHEM 2031. Prereq: Admission into specific CU Denver program or consent of instructor is required to enroll. Working knowledge of high school algebra and advanced high school chemistry are required. Coreq: CHEM 2088. No co-credit with CHEM 2031. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 2088 - Honors General Chemistry I Laboratory

Laboratory experiments on topics covered in CHEM 2031 or CHEM 2081, gaining experience in observing, recording, and interpreting physical and chemical phenomena. Offers smaller sections and greater access to specialized techniques, open ended experiments, and instrumentation, requiring a faster pace and more sophisticated work. Note: Students may not receive credit for this course if they have already received credit for CHEM 2038. Prereq: Admission into specific CU Denver program or consent of instructor is required to enroll. Coreq: CHEM 2031 or CHEM 2081. No co-credit with CHEM 2038. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 2091 - Honors General Chemistry II Lecture

Continuation of CHEM 2081. Additional topics may include kinetics, equilibria and thermodynamics. Note: Students

may not receive credit for this course if they have already received credit for CHEM 2061. Note: Admission into specific CU Denver program or consent of the instructor is required. Prereq: CHEM 2081 or 2031 and permission of the instructor. Coreq: CHEM 2098 or 2068. Restriction: Restricted to Chemistry Honors Students. No co-credit with CHEM 2061. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 2098 - Honors General Chemistry II Laboratory

Students perform laboratory experiments on topics covered in General Chemistry II (CHEM 2061) or the companion Honors General Chemistry II course. Students gain experience in observing, recording, and interpreting physical and chemical phenomena. Honors General Chemistry II Laboratory is distinguished from the regular General Chemistry Laboratory by smaller sections, and greater access to specialized techniques, open ended experiments, and instrumentation. Students use the laboratory skills they developed in Honors General Chemistry I Laboratory to work independently with a special emphasis on recording, interpreting, and expressing data, chemical safety, the scientific literature, innovation in the laboratory, and presentation of scientific information in oral and poster formats. Prereq: Admission into specific CU Denver program or consent of instructor is required to enroll. Prereq: CHEM 2038 or CHEM 2088. Coreq: CHEM 2091 or CHEM 2061. Restriction: Restricted to Chemistry Honors Students. No co-credit with CHEM 2068. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 2300 - Nutritional Chemistry

Introduces nutrition intended primarily for majors in nursing, physical therapy, physical education. Topics include structure and metabolism of carbohydrates, lipids and proteins, functions of vitamins and minerals and food constituents. Prereq: CHEM 1000, 1474 or high school chemistry. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 2600 - Introductory Topics in Chemistry

This course is designed primarily for non-chemistry majors. Students will explore a special topic related to chemistry or biochemistry. A description of topics to be covered in the current semester is maintained on the Chemistry department website. Max hours: 6 Credits. **Semester Hours:** 1 to 3

CHEM 2840 - Independent Study: CHEM

Max hours: 3 Credits. **Semester Hours:** 1 to 3

CHEM 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

CHEM 3011 - Inorganic Chemistry

The fundamentals of inorganic chemistry, including: atomic, molecular and crystal structures; the energetics of reactions, acid-base interactions; and the chemistry of main group and transition metal elements, including coordination and organometallic chemistry. Prereq or Coreq: CHEM 3421 or 3491. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 3018 - Inorganic Chemistry Laboratory

Combines theoretical concepts with hands-on laboratory experience and introduces students to modern inorganic chemistry. Experiments cover both main group and transition metal chemistry with an emphasis on synthesis, characterization, and application of inorganic compounds. Prereq or Coreq: CHEM 3011. Max hours: 2 Credits.

Semester Hours: 2 to 2

CHEM 3111 - Analytical Chemistry

Topics include sampling, volumetric analyses, instrumental analyses and statistical treatment of data. Note: Lecture course for chemistry, biology, medical technology and environmental students. Prereq: CHEM 2061 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 3118 - Analytical Chemistry Laboratory

CHEM 3118 provides a strong background in those chemical principles that are particularly important to analytical chemistry, such as the ability to obtain high-quality analytical data. Students gain experience with techniques of sampling and analysis, including an introduction to instrumental methods. Additionally, students develop the skills needed to solve analytical problems in a quantitative manner, with the aid of spreadsheet tools. The post laboratory assignments demonstrate a writing process that follows the guidelines of the American Chemical Society. Note: Laboratory course to be taken concurrently with CHEM 3111. Prereq: CHEM 2068 with a C- or higher. Coreq: CHEM 3111. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 3411 - Organic Chemistry I

Lecture course designed to introduce the study of structure, reactions, properties, and mechanisms of organic molecules. Prereq: CHEM 2061 or 2091 with a C- or higher. No co-credit with CHEM 3481. Max hours: 4 Credits.

Semester Hours: 4 to 4

CHEM 3418 - Organic Chemistry Laboratory I

Laboratory course to augment concepts of CHEM 3411, illustrating the practical aspects of organic chemistry. Prereq: CHEM 2068 or 2098 with a C- or higher. Coreq: CHEM 3411. No co-credit with CHEM 3488. Max hours: 1 Credit.

Semester Hours: 1 to 1

CHEM 3421 - Organic Chemistry II

Lecture course designed to introduce the study of structure, reaction, properties and mechanisms of organic molecules. Note: Continuation of CHEM 3411. Prereq: CHEM 3411 or 3481 with a C- or higher. No co-credit with CHEM 3491. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 3428 - Organic Chemistry Laboratory II

Laboratory course to augment concepts of CHEM 3421, illustrating the practical aspects of organic chemistry. Prereq: CHEM 3418 or 3488 with a C- or higher; Coreq: CHEM 3421 or CHEM 3491. No co-credit with CHEM 3498. Max hours: 1 Credit. **Semester Hours:** 1 to 1

CHEM 3481 - Honors Organic Chemistry I

An accelerated introduction to fundamental structural, analytical, and mechanistic aspects of organic molecules and their reactions. Prereq: CHEM 2061 or CHEM 2091, and CHEM 2068 or CHEM 2098. Coreq: CHEM 3488. Restriction: Restricted to students in the honors organic chemistry student group OCH1. No co-credit with CHEM 3411. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 3488 - Honors Organic Chemistry Laboratory I

Honors laboratory class to accompany CHEM 3481. Students will learn the basic techniques of organic synthesis, purification and analysis while carrying out extended experiments. Prereq: CHEM 2068 or CHEM 2098. Coreq: CHEM 3481. Restriction: Restricted to students in the honors organic chemistry student group OCH1. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 3491 - Honors Organic Chemistry II

Second semester organic chemistry. Theoretical concepts and practical aspects of organic structure, mechanism, synthesis and analysis. Note: Required for chemistry majors and open to all students. Prereq: CHEM 3411 or CHEM 3481 and CHEM 3418 or CHEM 3488 with a C- or higher and instructor consent are required in order to enroll in this course. No co-credit with CHEM 3421. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 3498 - Honors Organic Chemistry Laboratory II

In small groups, students use the chemical literature to devise multi-step syntheses and determine reaction mechanisms for organic compounds. Note: Laboratory course required for chemistry majors. Open to non-majors on approval of the instructor. Prereq: CHEM 3411 or CHEM 3481 and CHEM 3418 or CHEM 3488 with a C- or higher and instructor consent are required in order to enroll in this course. Coreq: CHEM 3421 or CHEM 3491. Note: Students must also receive permission from the Chemistry major advisor in order to enroll. No co-credit with CHEM 3428. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 3510 - Physical Chemistry: Biological Applications.

An introduction to physical chemistry that examines the principles of thermodynamics, equilibrium solutions, and kinetics as they apply to biological systems. Calculus required to learn the principles is presented in the course. Prereq: CHEM 2061, MATH 1120 (or 1130, 1401, 2411, 2421) and PHYS 2020 with a C- or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 3810 - Biochemistry

Introduces the principles of biochemistry for science and health science-oriented majors. Designed to cover the

important aspects of modern biochemistry. Prereq: BIOL 2061 or 2097 and CHEM 3411 or 3481 with a C- or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 3840 - Independent Study

Max hours: 6 Credits. **Semester Hours:** 1 to 3

CHEM 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and at least a 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

CHEM 4121 - Instrumental Analysis

Surveys instrumental methods of analysis, emphasizing atomic and molecular spectroscopy, mass spectrometry, surface characterization, and chromatography techniques. Students are introduced to a wide array of powerful and elegant tools for obtaining qualitative and quantitative information about the composition and structure of matter. Prereq: CHEM 3111, CHEM 3421 or CHEM 3491, CHEM 4521 and PHYS 2331 with a C- or higher. Coreq for Chemistry majors: CHEM 4128. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 4128 - Instrumental Analysis Laboratory

CHEM 4128 demonstrates a wide array of powerful and elegant tools for obtaining qualitative and quantitative information about the composition and structure of matter. The post laboratory assignments demonstrate a writing process that follows the guidelines of the American Chemical Society. Note: Required of chemistry majors and open to other students in CHEM 4121. Prereq: CHEM 3118 and 4538 with a C- or higher. Coreq: CHEM 4121. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 4511 - Physical Chemistry: Thermodynamics and Kinetics

Includes study of the laws of thermodynamics, thermochemistry, chemical equilibria, solutions and statistical mechanics. Prereq: PHYS 2331 with a C- or higher. Coreq: MATH 3511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 4518 - Physical Chemistry Laboratory: Reaction Analysis

Instruction in the experimental techniques of physical chemistry with emphasis on the properties of gases, thermodynamics and chemical equilibrium. Prereq: CHEM 3118 with a C- or higher. Coreq: CHEM 4511. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 4521 - Physical Chemistry: Quantum and Spectroscopy

Continuation of CHEM 4511, with emphasis on chemical kinetics, quantum mechanics, molecular structure and

spectroscopy. Prereq: PHYS 2331 with a C- or higher. Coreq: MATH 3511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 4538 - Physical Chemistry Laboratory: Molecular Structure

CHEM 4538 explores the central principles of physical chemistry, with emphasis on quantum chemistry, spectroscopy, and computational methods. The post laboratory assignments demonstrate a writing process that follows the guidelines of the American Chemical Society. Prereq: CHEM 3118 with a C- or higher. Co-Req: CHEM 4521. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 4548 - Physical Biochemistry Laboratory

Experimental techniques of physical chemistry emphasizing thermodynamics, kinetics, and spectroscopy of biological molecules. Fulfills the Physical Chemistry Lab requirement for Biochemistry Emphasis majors. Prereq: CHEM 3118. Prereq/Coreq: CHEM 4511 and CHEM 4521. Recommended Preparation: CHEM 4810. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 4600 - Advanced Topics in Chemistry

Upper-level majors in chemistry or a related discipline explore a special topic in chemistry or biochemistry. A description of topics to be covered in the current semester is maintained on the Chemistry department website. Max hours: 6 Credits. **Semester Hours:** 1 to 3

CHEM 4610 - Understanding & Presenting Chemical Research

This course will improve your ability to systematically search for chemical information, help you interpret the information you find, & improve your ability to summarize and present that information. Prereq: CHEM 2061 or CHEM 2091 with a C- or higher. Cross-listed with CHEM 5610. Max hours: 2 Credits. **Semester Hours:** 1 to 2

CHEM 4700 - Environmental Chemistry

A discussion of the sources, reactions, transport, effects, and fates of chemical species in the water, soil, and air environments. Prereq: CHEM 3111 or 3411 with a C- or higher. Cross-listed with CHEM 5700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 4810 - General Biochemistry I

Topics include structure, conformation, and properties of proteins; enzymes, mechanisms and kinetics; carbohydrates, lipids and membranes, and energetics. Prereq: CHEM 3421 or 3491 or 3810 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 4820 - General Biochemistry II

Topics include biosynthesis and metabolism of carbohydrates, lipids and amino acids, information processing. Note: continuation of CHEM 4810. Prereq: CHEM 3810 or 4810 or 5810 with a C- or higher. Max hours: 3 Credits.

Semester Hours: 3 to 3

CHEM 4828 - Biochemistry Lab

Focuses on modern laboratory techniques for biochemical research, with an emphasis on methods for protein isolation, purification, and identification. Students perform experiments involving (but not limited to) chromatography, electrophoresis, spectrophotometry, and protein activity assays. Prereq: CHEM 3810 or 4810 with a C- or higher. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CHEM 4835 - Biochemistry of Cancer

Explores the biochemical aspects of cancer causation and treatment. Topics include DNA and protein damage, oncogenes and tumor suppressors, the chemistry of chemotherapeutic agents, and the mechanisms of resistance to anticancer drugs. Prereq: CHEM 3810 or 4810 with a C- or higher. Cross-listed with CHEM 5835. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 4840 - Independent Study: Chem

Prereq: Permission of instructor required. Max hours: 12 Credits. **Semester Hours:** 1 to 6

CHEM 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CHEM 5010 - Advanced Inorganic Chemistry

Covers the fundamental principles of inorganic chemistry. Topics include atomic structure and periodicity, molecular symmetry, bonding, structural chemistry, main-group chemistry, coordination chemistry, and organometallic chemistry. Requisite knowledge in Undergraduate Inorganic and Physical Chemistry assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5071 - RM-MSMSP: Atoms and Properties of Matter

Systematic study of the structure of the atom, how atoms interact to form bonds, how matter behaves at the molecular level, the periodic table, and the macroscopic properties of matter. Concepts are linked to other scientific, mathematical, societal, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: Permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5072 - RM-MSMSP: Interactions of Elements and Compounds

Systematic study of solubility (physical and chemical properties of solutions and the chemistry of acids, bases, pH, and buffer solutions), oxidation or reduction reactions, reaction energetics (thermodynamics and kinetics), and applications of chemistry to environmental, biochemical, and nutritional problems. Concepts are linked to other scientific, mathematical, societal, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: CHEM 5071 with a B- or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5073 - RM-MSMSP Research Experience for Teachers - Chemistry Cohort

The Research Experience for Teachers (RET) program will be a five-week research exploration in which twelve RM-MSMSP teachers will raise their level of relevant scientific understanding by engaging in a "hands on" workshop, transforming what they have learned into new curricular materials that will improve the scientific abilities of their students and hopefully stimulate them to consider a STEM career. Note: Credit may not apply toward any CLAS degree. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CHEM 5110 - Advanced Analytical Chemistry

Explores the fundamental principles of analytical chemistry. Topics will focus on meteorology (the science of making measurements), measurements based on energy transfer (e.g. spectroscopic analysis), and measurements based on mass transfer (e.g. chemical separations and electrochemistry). Requisite knowledge in Undergraduate Instrumental Analysis is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5130 - Surface Analytical Techniques

Surveys widely used techniques for surface analysis, including thermal desorption, mass spectrometry, X-ray photoelectron spectroscopy, and surface electrochemistry. Applications to catalyst and organic or biological surfaces are included. Requisite knowledge in Undergraduate Instrumental Analysis is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5250 - Chemometrics: Data Analysis

Provides chemists and environmental scientists with the basic statistical skills for effective data analysis and experimental design. Minimal theoretical detail is provided; practical applications and graphical techniques are emphasized. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5310 - Advanced Organic Chemistry

An exploration of structure, bonding and reactivity in organic modules that includes extensive analysis of the chemical literature, culminating in written and seminar presentations of individual projects. Requisite knowledge in Undergraduate Organic Chemistry and Physical Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5510 - Computational Chemistry

Classical and ab initio molecular dynamics are covered from theory to application. Students have access to high-performance computational resources and cover current topics in the field. Requisite knowledge in Undergraduate Physical Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5520 - Molecular Structure and Spectra

Applies quantum mechanics to the understanding of molecular structure and spectroscopy. Requisite knowledge in Undergraduate Physical Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5530 - Advanced Physical Chemistry

Explores fundamental properties of molecules (bond length and strength, the potential energy surface, reaction rates, etc.) and examines how these properties are measured, using original literature as the primary source, and culminating in written and seminar presentations of individual projects. Requisite knowledge in Undergraduate Physical Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5550 - Applications of Group Theory in Chemistry

Introduces the basic principles of the group theoretical method as well as its applications in organic, inorganic, and physical chemistry. Covers Mo's for main-group and transition metal compounds, ligand field theory, molecular vibrations, and electron absorption spectroscopy. Requisite knowledge in Undergraduate Physical Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5600 - Graduate Topics in Chemistry

Graduate students in chemistry or a related discipline explore a special topic in chemistry or biochemistry. A description of topics to be covered in the current semester is maintained on the Chemistry department website. Restriction: Restricted to degree-granting Graduate programs. Max hours: 6 Credits. **Semester Hours:** 1 to 3

CHEM 5610 - Understanding & Presenting Chemical Research

This course will improve your ability to systematically search for chemical information, help you interpret the information you find, & improve your ability to summarize and present that information. Restriction: Restricted to degree-granting Graduate programs. Cross-listed with CHEM 4610. Max hours: 2 Credits. **Semester Hours:** 1 to 2

CHEM 5700 - Environmental Chemistry

A discussion of the sources, reactions, transport, effects, and fates of chemical species in the water, soil and air environments. Requisite knowledge in Undergraduate Organic and Analytical Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Cross-listed with CHEM 4700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5710 - Air Pollution Chemistry

Chemical processes occurring in the atmosphere are discussed. Includes application to air pollution problems, including urban air pollution, air quality standards, non-urban air pollution, acid deposition, and stratospheric pollution. Requisite knowledge in Undergraduate Physical or Environmental Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5720 - Atmospheric Sampling and Analysis

Fundamentals of environmental sampling specifically applied to the atmosphere are discussed. Includes a variety of techniques for the measurement of monitoring gaseous, semi-volatile and particulate air pollutants, techniques for the measurement of criteria pollutants, chemical and physical measurements of particulate and air toxins. Prereq: CHEM 5710 with a B- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5810 - Graduate Biochemistry I

Topics include proteins, mechanisms and kinetics of enzymes, carbohydrates, lipids and membranes, nucleic acids, genetic engineering, signaling pathways, and energetics, which are integrated with critical analysis of recent journal papers, culminating in written and seminar presentations of individual projects. Requisite knowledge in Undergraduate Organic Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5830 - Graduate Biochemistry II

Topics include biosynthesis & metabolism of carbohydrates, lipids& amino acids, & genetic information flow of DNA replication, transcription, translation& regulation of transcription, which are integrated with critical analysis of recent literature, culminating in written& seminar presentations of individual projects. Continuation of 5810. Prereq: CHEM 5810 with a B- or higher. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CHEM 5835 - Biochemistry of Cancer

Explores the biochemical aspects of cancer causation and treatment. Topics include DNA and protein damage, oncogenes and tumor suppressors, the chemistry of chemotherapeutic agents, and the mechanisms of resistance to anticancer drugs. Prereq: CHEM 5810 with a B- or higher. Cross-listed with CHEM 4835. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHEM 5840 - Independent Study

Max hours: 9 Credits. **Semester Hours:** 1 to 3

CHEM 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty

prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CHEM 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

CHEM 5950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

CHEM 6000 - Chemistry Seminar

Faculty and student presentations of CU-Denver research projects and other current chemistry topics. Note: All chemistry students are encouraged to attend, but credit is given only to those who present seminars. Requisite knowledge in Undergraduate Physical or Environmental Chemistry is assumed. Restriction: Restricted to degree-granting Graduate programs. Max hours: 3 Credits. **Semester Hours:** 1 to 3

CHEM 6001 - Master's Research Seminar

Students present a formal seminar to the department describing their master's research work. Note: Required for all students completing a thesis-based master's degree; optional for those completing master's projects. Prereq: CHEM 6000 with a B- or higher. Max hours: 1 Credit. **Semester Hours:** 1 to 1

CHEM 6002 - Chemistry Seminar I

The art of listening to and giving a chemistry seminar. Introduces the chemical literature, the pedagogical techniques of seminar giving, and the critical thinking skills required to understand a technical presentation. Note: Seminar presentations by faculty, outside speakers, and advanced graduate students are analyzed by the students participating in the course. Restriction: Restricted to degree-granting Graduate programs. Max hours: 1 Credit. **Semester Hours:** 1 to 1

CHEM 6003 - Chemistry Seminar II

Students prepare and give a chemical seminar based on a literature paper. Note: Seminar presentations by students and outside speakers are analyzed by students in the course. Restriction: Restricted to degree-granting Graduate programs. Max hours: 1 Credit. **Semester Hours:** 1 to 1

CHEM 6840 - Independent Study: CHEM

Max hours: 9 Credits. **Semester Hours:** 1 to 6

CHEM 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

CHEM 6960 - Master's Report

Max hours: 6 Credits. **Semester Hours:** 1 to 6

CHIN 1000 - China and the Chinese

A multidisciplinary introduction to Chinese society both past and present. Prehistory, birth of imperial China, literature, philosophy, religion, nationalism, revolution, modernization, contemporary life, social structure, gender, food, family life, population policy, ethnicity, popular culture, economics and politics. Note: This course is taught in English. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1. **Semester Hours:** 3 to 3

CHIN 1010 - Beginning Chinese I

A basic introduction to Chinese language and culture. Students study pronunciation, vocabulary, grammar and simple writing techniques. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. No previous study of Chinese is required. Max hours: 5 Credits. **Semester Hours:** 5 to 5

CHIN 1020 - Beginning Chinese II

(Continuation of CHIN 1010.) Further practice of pronunciation, study of vocabulary, grammar, and simple writing techniques. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed CHIN 1010 or equivalent, or have taken one year of high school Chinese, or possess equivalent proficiency. A grade of C- or higher in CHIN 1010 is recommended for success in this course. This course is not intended for native speakers. Max hours: 5 Credits. **Semester Hours:** 5 to 5

CHIN 1071 - Mandarin Chinese for the Professions

Provides students with language skills and cultural knowledge in the context of conducting business with Chinese. Students develop elementary language skills for communication, cultural awareness and business etiquette via structured thematic units with business scenarios and simulations. Note: Chinese 1071 cannot be taken to fulfill language requirements; nor can it be used to substitute for Chinese 1010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

CHIN 2110 - Second Year Chinese I

Continuing development of listening, speaking, reading, and writing skills in practical Chinese, with grammar review and introduction of the Chinese dictionary. In addition to contemporary Chinese, there is some emphasis on Chinese classical materials, such as proverbs. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed CHIN 1020 or equivalent, or have taken two years of high school Chinese, or possess equivalent proficiency. A grade of C- or higher in CHIN 1020 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits.

Semester Hours: 3 to 3

CHIN 2120 - Second Year Chinese II

(Continuation of CHIN 2110.) Satisfies the fourth semester language requirement at most graduate schools. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed CHIN 2110 or equivalent, or have taken three years of high school Chinese, or possess equivalent proficiency. A grade of C- or higher in CHIN 2110 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 2840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

CHIN 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Sophomore standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

CHIN 2970 - Contemporary Chinese Cinema

Introduces students to Chinese cinema, one of the most powerful and often controversial modes of representing society, culture, history and politics in China. Note: Taught in English. All films have English subtitles. No previous study of Chinese language or culture is required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 3200 - Contemporary Chinese Society and Culture

Provides students with an overview of the systems in modern China (such as educational, political and economical), its family and interpersonal constructs and the elements of modern China found in popular cultures. It also exposes students to rudimentary and practical use of the Chinese language. Note: This course is taught in English. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 3300 - Special Topics on Chinese Film

Studies the cultural, social and historical conditions that have shaped Chinese cinema. May focus on one Chinese speaking country or more than one (including but not limited to China, Taiwan and Hong Kong). May focus on a particular period (pre-Cultural revolution, for example) or a particular theme (urban cinema or martial arts films, for example). Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 3840 - Independent Study: CHIN

Max hours: 6 Credits. **Semester Hours:** 1 to 3

CHIN 3995 - Travel Study

A travel study abroad course to one or more Chinese speaking countries. Topics of the course will vary depending on the instructor, sites visited and focus of the course. Topics may include intensive language training, film studies, contemporary issues, literary and cultural studies, etc. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CHIN 5100 - Methods of Teaching Chinese Immersion

Provides students with an overview of teaching in an immersion environment in Mandarin Chinese. Topics include: immersion models, language/contents and culture, first and second language acquisition, curriculum design, national and state curriculum standards, program management and program assessment. Note: Taught in English. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CHIN 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CLAS 2939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 3

CLAS 3939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

CLAS 4840 - Independent Study: CLAS

Max hours: 12 Credits. **Semester Hours:** 1 to 3

CLDE 5140 - Language, Culture & Educational Equity

Develops an understanding of the pluralistic and intersectional nature of U.S. society (race, class, gender, sexuality, language, migration status), and the role of the school within this social context. Examines the legal and cultural history of language education in Colorado and the U.S. as well as the impact of changing demographics on schools. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CLDE 5160 - History & Law of Bilingual & Immigrant Education

This course includes an overview of U.S. and Colorado history and legislation related to bilingual education and second language education, as well as current and historical immigration issues as they impact students, families, communities, schools, and educators. Cross-listed with CLDE 4160. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CMDT 4582 - Commodity Supply Chain Management

This course introduces the design, analysis, management, and control of supply chains as applied to commodities. The course covers integration of processes and systems, relationship management of upstream and downstream supply chain players, and commodity-specific supply chain strategies. Cross-listed with CMDT 6582. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CMDT 4682 - Trading in Commodity and Financial Markets

This course puts students at the leading edge of designing, testing and applying trading strategies across commodities, equities, fixed income and alternative assets, in the Business School's unique, state-of-the-art J.P. Morgan Commodity and Finance Lab. Cross-listed with CMDT 6682. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CMDT 4802 - Foundations of Commodities

This course introduces students to the physical aspects of commodities and connects them to the financial markets in which commodities are traded. Fundamental concepts and terminology necessary for understanding commodity production, transportation, economics, financial analysis and marketing are described. Supply chains for several specific commodities are reviewed in detail, as examples of the production and market structure knowledge needed to be successful professional participants in commodity trading capacities. The course also serves a foundation for more focused education in the specific commodity sectors, as well as the applied use of marketing and financial trading concepts learned in other courses. Cross-listed with CMDT 6802 and FNCE 4802/6802. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CMDT 6582 - Commodity Supply Chain Management

This course introduces the design, analysis, management, and control of supply chains as applied to commodities. The course covers integration of processes and systems, relationship management of upstream and downstream supply chain players, and commodity-specific supply chain strategies. Cross-listed with CMDT 4582. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits.

Semester Hours: 3 to 3

CMDT 6682 - Trading in Commodity and Financial Markets

This course puts students at the leading edge of designing, testing and applying trading strategies across commodities, equities, fixed income and alternative assets, in the Business School's unique, state-of-the-art J.P. Morgan Commodity and Finance Lab. Note: Students cannot receive credit for both CMDT 6482 or FNCE 6482. Cross-listed with CMDT 4682. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CMDT 6802 - Foundations of Commodities

This course introduces students to the physical aspects of commodities and connects them to the financial markets in which commodities are traded. Fundamental concepts and terminology necessary for understanding commodity production, transportation, economics, financial analysis and marketing are described. Supply chains for several specific commodities are reviewed in detail, as examples of the production and market structure knowledge needed to be successful professional participants in commodity trading capacities. The course also serves a foundation for more focused education in the specific commodity sectors, as well as the applied use of marketing and financial trading concepts learned in other courses. Cross-listed with CMDT 4802 and FNCE 4802/6802. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits.

Semester Hours: 3 to 3

COMM 1001 - Presentational Speaking

Theory and practice of presentational speaking in a variety of contexts to accomplish goals of asserting individuality, building community, securing adherence, discovering knowledge and belief, and offering perspectives. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 1011 - Fundamentals of Communication

Studies communication theory and application. Topics include communication models, interpersonal communication and the concept of self, nonverbal communication, message preparation and analysis, and decision making. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3. **Semester Hours:** 3 to 3

COMM 1021 - Introduction To Media Studies

Explores the role of contemporary media in shaping our sense of ourselves and our world. The class surveys a broad

array of critical approaches to understanding media. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3. **Semester Hours:** 3 to 3

COMM 1041 - Interpersonal Communication

Focuses on the theory and development of interpersonal relationships. Issues covered include the communication process, self versus others, self-esteem, person perception, the attraction process, nonverbal communication, relationship development and family communication. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 1051 - Topics in Communication

Special classes for faculty-directed experiences examining communication issues and problems not generally covered in the curriculum. Max hours: 3 Credits. **Semester Hours:** 1 to 3

COMM 1071 - Introduction to Journalism

Introduction to Journalism provides students a broad overview of the histories of, debates within, and best practices for journalism in print, digital, and other media. This is a writing intensive course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

COMM 2000 - Persuasion

Examines influence and communication at individual, group, organizational and societal levels. A theoretical and applied analysis of persuasion, including examination of public opinion, individual attitudes, beliefs, values, sources, credibility, ethics, and certain message and audience variables. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 2020 - Communication, Citizenship, and Social Justice

Introduction to debates about, and means of practicing citizenship and social justice in America. Issues may include democratic participation, electoral politics, community activism, inequality, and environmental degradation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 2045 - Workplace Communication

Focuses on theories and practices of leadership, teambuilding, relationship development and other workplace communication skills. The goal of the course is to help students develop advanced communication strategies for managing workplace challenges. Max hours: 3 Credits. **Semester Hours:** 2 to 3

COMM 2050 - Business and Professional Speaking

Development of communication skills often used in business and professional settings, with an emphasis on various kinds of presentations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 2051 - Introduction to Strategic Communication

Provides students foundational skills of marketing & public relations, targeted political messaging, and organizational communication, merging theory & practices to study how strategic communication works in different media environments. Students will not receive credit for this class if they have already received credit for COMM 4635. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 2071 - Media Writing Skills

A writing intensive course that covers all aspects of writing for new media environments, including both traditional journalistic practices and digital genres. Students will not receive credit for this class if they have already received credit for COMM 3680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 2082 - Introduction to Environmental Communication

Intro to Environmental Communication provides students with the foundations for analyzing public debates about environmental sustainability, global warming, economic development, corporate responsibility, and activist movements. Emphasis is placed on representations of these issues in TV, films, music, blogs, and public deliberation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 2140 - Argumentation

Examines classical through contemporary theories, with special attention to types of propositions, burden of proof, analysis of issues, evidence, reasoning, fallacies, case construction, refutation and ethics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3071 - Advanced Media Writing Skills

This class builds upon the skills learned in COMM 1051, Introduction to Journalism, and COMM 2071, Media Writing Skills, by focusing on long-form writing that is suitable for magazines and websites. Prereq: Students must have completed COMM 1051 and COMM 2071, or receive permission from the instructor, to enroll in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3230 - Chinese Communication & Culture in Context

This course is designed for CU Denver students studying at the ICB program in Beijing. For such students, the course introduces Chinese communication practices & cultural expectations, easing the student's transition into life in Beijing. Field trips are required & will be announced 1st day of class. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3231 - Famous U.S. Trials

This introduction to the history of the U.S. trial court system will contextualize significant trials in historic and cultural moments. The course will explore the roles of legal communication and mass communication in contemporary and subsequent representations of the trial. Cross-list HIST 3231. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3271 - Communication and Diversity

Explores the complexities of communication across diverse identities such as race, ethnicity, and gender. Course attempts to seek solutions via sharing meaning and discovering common ground. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3275 - Family Communication

Explores family communication processes in traditional and nontraditional families through examination of theories and research on the family. Topics include conflict, family secrets, decision-making, and practical guidelines for improved communication in families. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3650 - Media And Society

Approaches communication from a historical perspective, examining how major revolutions in communication technologies have influenced and impacted society over time. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 3840 - Independent Study

Max hours: 6 Credits. **Semester Hours:** 1 to 3

COMM 3939 - Internship

Applies communication or technical communication concepts and skills in supervised employment situations. Note: This course fulfills the communication department's exit class requirement. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

COMM 4000 - Communication and Sport

Examines the language and imagery used in sporting discourse. Considers how sports reflect and refract culture, both positively and negatively. Cross-list COMM 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4015 - Communication and Civility

Examines the central role of communication in the creation of a civil and humane society. The definition, understanding, and practices of civility in public discourse and in professional, social, and personal relationships are

explored. Film, literature, music, and other texts are utilized to illustrate key concepts and serve as catalysts for discussion. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4020 - Feminist Perspectives on Communication

Introduces the communication theories of major feminist theorists such as Mary Daly, Bell Hooks, and Sonia Johnson, with a focus on how their theories challenge and transform current understandings of communication. Cross-listed with COMM 5020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4021 - Perspectives on Rhetoric

Introduces major theories of rhetoric from classical through contemporary times, including the theories of Aristotle, Cicero, I. A. Richards, Kenneth Burke, Michel Foucault and Jurgen Habermas. Cross-listed with COMM 5021. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4022 - Critical Analysis of Communication

Surveys research methods used to analyze messages from rhetorical and critical perspectives. Cross-listed with COMM 5022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4031 - Perspectives on Communication

Overview of major theories and literature in the communication field that serve as the foundation for the study of communication. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4040 - Communication, Prisons, and Social Justice

Examines the U.S. prison-industrial complex and enables students to envision ways of reducing crime and improving democracy by engaging in community service. Note: This course fulfills the communication department's exit class requirement. Strongly Recommended: COMM 2020. Cross-listed with COMM 5040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4051 - Advanced Strategic Communication

Provides senior-level training in hands-on communication environments where targeted messaging seeks specific outcomes. All students complete projects for community group, media outlet or corporation they choose. Students will not receive credit for this class if they have already received credit for COMM 4640. Note: This course fulfills the communication department's exit class requirement. Prereq: Students must have taken and successfully completed COMM 2051 or COMM 2071/3680 or receive instructor permission to register for this course. Cross-listed with COMM 5051. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4082 - Wilderness Communication

The primary goal of this course is to engage issues of wilderness, communication, and environmental sustainability. Students will read philosophical, theoretical, and academic literature on human symbolic constructions of wilderness and engage course concepts in a 12-day wilderness experience. Cross-listed with COMM 5082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4111 - Theories of Leadership

Examines research and applications related to the major theories of leadership. Emphasizes a critical reading of research confirming or denying various theories, and stresses the historical development of theories of leadership behavior and characteristics. Cross-listed with COMM 5111. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4215 - Ethics in Communication

Designed to help students identify and address the daily ethical challenges that occur in private, social, and professional contexts. Focus is on recognizing, analyzing, and resolving real-world ethical dilemmas using diverse approaches to ethical decision making. Cross-listed with COMM 5215. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4221 - Research Methods: Qualitative

Applies qualitative research methods to human communication practices, including the processes of designing qualitative studies, collecting data, analyzing and interpreting data, and reporting results. Cross-listed with COMM 5221. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4230 - Nonverbal Communication

Studies nonverbal behaviors that accompany or replace verbal communication, including macrospace, proxemics, kinesics, facial expression, eye contact, gestures, vocal characteristics, touch and personal adornment. Cross-listed with COMM 5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4240 - Organizational Communication

Relationships among such communication factors as flow, media, channel, diversity, information delivery and organization functioning, morale, and productivity. Cross-listed with COMM 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4245 - Advanced Organizational Communication

Explores critical theoretical perspectives on communication in complex organizations, including issues and standpoints that have not been included in mainstream theory and research. Analyzes assumptions and pragmatic solutions associated with these theories. Cross-listed with COMM 5245. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4255 - Negotiations and Bargaining

Designed to allow students to study theories and apply concepts that explain the influences of various forms of mediating, reducing, and/or resolving conflict among individuals, groups, organizations, nations and cultures. Cross-listed with COMM 5255. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4260 - Communication and Conflict

Studies the influence of communication on intrapersonal, interpersonal, intragroup and intergroup conflict situations. Cross-listed with COMM 5260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4262 - Mediation

Explores theoretical and practical aspects of mediation in a variety of contexts ranging from divorce mediation to labor-management disputes. Cross-listed with COMM 5262. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4265 - Gender and Communication

Examines gender as it is constructed, performed, evaluated, and negotiated through communication. Topics covered include the nature of gender, the gender binary, scientific research on gender, gender stories in popular culture, the process of crafting and performing gender stories, and responses to gender performances. Cross-listed with COMM 5265. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4268 - Communication and Diversity in U.S. History

Explores issues of diversity and community in the construction of U.S. culture. Emphasis on legal and historical texts that codify or challenge majoritarian notions of difference and systems of social control. Cross-listed with COMM 5268. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4270 - Intercultural Communication

Examines the philosophy, process, problems, and potentials unique to communication across cultural boundaries. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with COMM 5270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4280 - Communication and Change

Examines the role of communication in change processes of various kinds, including social change and diffusion of innovations. Cross-listed with COMM 5280. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4282 - Environmental Communication

Studies the communication processes involved in policies and practices affecting natural and human environments. Cross-listed with COMM 5282. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4290 - Web Design

Covers writing web pages in HTML, beginning Photoshop, style sheets, bitmapped animations, issues of usable layout, navigability, structure, typography, and color on the web. Projects require students to develop static web sites. Cross-listed with COMM 5290. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4300 - Multimedia Authoring

Analysis and evaluation of components of multimedia development and hands-on instruction featuring computer animation for advertising, training, and educational projects. Cross-listed with COMM 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4430 - Communication, China, and the US

This course provides a senior-level opportunity to study how China & the USA have spoken about & to each other, from the Opium War through Cyber Wars, thus situating these nations in a world of globalizing communication. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with COMM 5430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4500 - Health Communication

Examines the role of communication in a wide range of health contexts. Topics include cultural constructions of health and illness, public health communication campaigns, client-provider interactions, telemedicine, community-based health programs and medical journalism. Note: This course fulfills the communication department's exit class requirement. Cross-listed with COMM 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4525 - Health Communication and Community

This course provides a broad knowledge base about health disparities and culturally competent frameworks in healthcare by enabling students to engage in service-learning projects with local health-related community groups. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4550 - Rhetorics of Medicine & Health

This senior seminar/bridge class investigates persuasion in contemporary medicine/health care from clinical settings through mass media. Case studies explore contagion, health policy, the body, death, and biopower. The course requires extensive discussion of readings and an original research project. Note: This course fulfills the communication department's exit class requirement. Cross-listed with COMM 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4558 - Digital Health Narratives

This course blends readings, discussions and activities about health narratives with digital media production skills to

teach students how to create compelling digital stories about health-related topics. Cross-listed with COMM 5558. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4600 - Media Theory

Surveys a broad array of critical and interpretive approaches to the study of media. Approaches include political economic, semiotic, rhetorical, psychoanalytic, feminist, and cultural. Cross-listed with COMM 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4601 - You Are What You Eat: Food as Communication

Because food provides a communication channel for much of who we are as individuals, as a community and as a society this course analyzes food as a form of communication. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with COMM 5601. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4610 - Communication, media, and sexuality

Developing tools to think critically about representations of sexuality and to understand the social construction of sexuality, the role of sexual representations in mass media and society and the complex relationship between sexual acts, identities and desires. Restriction: Restricted to class level Junior, Senior, or permission of instructor. Cross-listed with WGST 4610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4620 - Health Risk Communication

Acquaints students with contemporary theory, research, and practice in health risk communication. Strongly Recommended: COMM 4500. Cross-listed with COMM 5620, HBSC 5620, ENVS 5620, and PBHL 4620. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4621 - Visual Communication

Explores the social, cultural, and behavioral effects of visual images in a variety of contexts, including graffiti, film, advertising, art and architecture. Cross-listed with COMM 5621. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4665 - Principles of Advertising

Provides a fundamental understanding and appreciation of advertising in today's global society, including consumer motivation, buying behavior, research, creative development and media planning. Cross-listed with COMM 5665. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4680 - Mass Media Law And Policy

Covers issues of mass communication and the law and ethics, including issues of the First and Fourth Amendments,

communication regulations, intellectual property, public access and obscenity. Cross-listed with COMM 5680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4681 - Communication Issues in Trial Court Practices and Processes

Introduces students to communication and language research aimed at improving the fairness, reliability, and validity of court and judicial processes, including lawyer-client interviews, interrogatories, jury selection, jury instructions, witness examination, and the use of language evidence in court. Strongly Recommended: ENGL 2030. Cross-listed with COMM 5681. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4682 - Political Communication

Examines the communication processes involved in mediated political events. Topics include the stages of the campaign process, media coverage of the political campaign process, and literacy skills needed to understand political advertising. Cross-listed with COMM 5682. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4683 - Media in the Courtroom

Critically examines the complex issues raised by media involvement in criminal court cases, including effects of pre-trial publicity, cameras in the courtroom, participants who argue their stories to the media, the CSI effect, and other phenomena relevant to media influence. Max hours: 6 Credits. **Semester Hours:** 3 to 3

COMM 4688 - Senior Seminar: Transitioning from College to Career

Synthesis experience for communication majors designed to prepare students to enter the job market and to integrate and reflect on their experience in communication. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4700 - Writing Practicum

Methods course focused on strategies of research design and writing for undergraduate students working on theses for Latin honors and for master's students seeking to complete a major research paper or thesis. Note: This course fulfills the communication department's exit class requirement. Cross-listed with COMM 5700. To be eligible to enroll in this course you must be a senior majoring in communication, have a cumulative GPA of 3.0 and have a GPA in your communication coursework of 3.5. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4710 - Topics in Communication

Special classes for faculty-directed experiences examining communication issues and problems not generally covered in the curriculum. Cross-listed with COMM 5710. Max hours: 15 Credits. **Semester Hours:** 1 to 3

COMM 4720 - Dynamics of Global Communication

Explores the word "global" in a communication context by analyzing the relationships between world media,

international events, economics and the geopolitics of culture. This analysis is supported by the application of mass, human and cultural communication theory. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with COMM 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4750 - Legal Reasoning and Writing

Introduces the fundamentals of legal reasoning and legal argumentation through intensive class discussion, formal debate and writing. Attention is given to the relationship between case and statutory law and their application in trial and appeals courts in the United States. Strongly Recommended: ENGL 1020, ENGL 2030 and any 3000 level English course. Cross-listed with COMM 5750, PSCI 4757, 5747. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4760 - New Media

Analysis and discussion of the nature, use, and effects of computer-mediated communication in interpersonal, work, educational, societal and international contexts. Focus is on the social aspects of computer-mediated communication rather than on specific software or hardware technologies. Cross-listed with COMM 5760. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 4840 - Independent Study

Prereq: Permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

COMM 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

COMM 4995 - Travel Study

Students study various topics in a foreign country led by a CU-Denver instructor; register through the Office of International Education. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course fulfills the communication department's exit class requirement. Cross-listed with COMM 5995. Max hours: 15 Credits. **Semester Hours:** 1 to 15

COMM 5000 - Communication and Sport

Examines the language and imagery used in sporting discourse. Considers how sports reflect and refract culture, both positively and negatively. Cross-list COMM 4000. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5015 - Communication and Civility

Examines the central role of communication in the creation and humane society. The definition, understanding, and practices of civility in public discourse and in professional, social, and personal relationships are explored. Film, literature, music, and other texts are utilized to illustrate key concepts and serve as catalysts for discussion. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5020 - Feminist Perspectives on Communication

Introduces the communication theories of major feminist theorists such as Mary Daly, Bell Hooks, and Sonia Johnson, with a focus on how their theories challenge and transform current understandings of communication. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5021 - Perspectives on Rhetoric

Introduces major theories of rhetoric from classical through contemporary times, including the theories of Aristotle, Cicero, I. A. Richards, Kenneth Burke, Michel Foucault and Jurgen Habermas. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4021. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5022 - Critical Analysis of Communication

Surveys research methods used to analyze messages from rhetorical and critical perspectives. Prereq: Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4022. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5040 - Communication, Prisons, and Social Justice

Examines the U.S. prison-industrial complex and enables students to envision ways of reducing crime and improving democracy by engaging in community service. Note: This course fulfills the communication department's exit class requirement. Prereq: COMM 2020, or permission of instructor. Cross-listed with COMM 4040. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5051 - Advanced Strategic Communication

Provides senior-level training in hands-on communication environments where targeted messaging seeks specific outcomes. All students complete projects for community group, media outlet or corporation they choose. Students will not receive credit for this class if they have already received credit for COMM 5640. Cross-listed with COMM 4051. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5082 - Wilderness Communication

The primary goal of this course is to engage issues of wilderness, communication, and environmental sustainability. Students will read philosophical, theoretical, and academic literature on human symbolic constructions of wilderness

and engage course concepts in a 12-day wilderness experience. Cross-listed with COMM 4082. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5111 - Theories of Leadership

Examines research and applications related to the major theories of leadership. Emphasizes a critical reading of research confirming or denying various theories, and stresses the historical development of theories of leadership behavior and characteristics. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4111. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5140 - Argumentation

Examines classical through contemporary theories, with special attention to types of propositions, burden of proof, analysis of issues, evidence, reasoning, fallacies, case constructions, refutation and ethics. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5205 - Empirical Research Methods for Communication

Provides exposure to empirical research methods involved in communication research: surveys, experimental design, research reviews and meta-analysis, case study, ethnography, textual analysis, process tracing, others. Basic quantitative data analysis methods (correlation, chi-square, t-tests, ANOVA) are introduced. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5215 - Ethics in Communication

Designed to help students identify and address the daily ethical challenges that occur in private, social, and professional contexts. Focus is on recognizing, analyzing, and resolving real-world ethical dilemmas using diverse approaches to ethical decision making. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4215. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5221 - Research Methods: Qualitative

Applies qualitative research methods to human communication practices, including the processes of designing qualitative studies, collecting data, analyzing and interpreting data, and reporting results. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4221. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5230 - Nonverbal Communication

Studies nonverbal behaviors that accompany or replace verbal communication, including macrospace, proxemics, kinesics, facial expression, eye contact, gestures, vocal characteristics, touch and personal adornment. Restriction:

Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5240 - Organizational Communication

Relationships among such communication factors as flow, media, channel, diversity, information delivery and organization functioning, morale, and productivity. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5245 - Advanced Organizational Communication

Explores critical theoretical perspectives on communication in complex organizations, including issues and standpoints that have not been included in mainstream theory and research. Analyzes assumptions and pragmatic solutions associated with these theories. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4245. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5250 - Difference Matters and Organizational Communication

Explores theoretical and practical issues regarding relationships between communication processes in contemporary U.S. organizations and socially constructed aspects of individuals' identity (e.g., race, gender, sexual orientation, class, ability and age). Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5255 - Negotiations and Bargaining

Designed to allow students to study theories and apply concepts that explain the influences of various forms of mediating, reducing, and/or resolving conflict among individuals, groups, organizations, nations and cultures. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4255. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5260 - Communication and Conflict

Studies the influence of communication on intrapersonal, interpersonal, intragroup and intergroup conflict situations. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5262 - Mediation

Explores theoretical and practical aspects of mediation in a variety of contexts ranging from divorce mediation to labor-management disputes. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4262. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5265 - Gender and Communication

Explores the relationship between gender and communication, including how language treats women and men differently and verbal and nonverbal differences in women's and men's communication. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4265. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5268 - Communication and Diversity in U.S. History

Explores issues of diversity and community in the construction of U.S. culture. Emphasis on legal and historical texts that codify or challenge majoritarian notions of difference and systems of social control. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4268. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5270 - Intercultural Communication

Examines the philosophy, process, problems, and potentials unique to communication across cultural boundaries. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5280 - Communication and Change

Examines the role of communication in change processes of various kinds, including social change and diffusion of innovations. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4280. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5282 - Environmental Communication

Studies the communication processes involved in policies and practices affecting natural and human environments. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4282. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5290 - Web Design

Covers writing web pages in HTML, beginning Photoshop, style sheets, bitmapped animations, issues of usable layout, navigability, structure, typography, and color on the web. Projects require students to develop static web sites. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4290. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5300 - Multimedia Authoring

Analysis and evaluation of components of multimedia development and hands-on instruction featuring computer

animation for advertising, training, and educational projects. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5430 - Communication, China, & the US

This course provides a graduate-level opportunity to study how China & the USA have spoken about & to each other, from the Opium War through Cyber Wars, thus situating these nations in a world of globalizing communication. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-listed with COMM 4430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5500 - Health Communication

Examines the role of communication in a wide range of health contexts. Topics include cultural constructions of health and illness, public health communication campaigns, client-provider interactions, telemedicine, community-based health programs and medical journalism. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5550 - Rhetorics of Medicine & Health

This senior seminar/bridge class investigates persuasion in contemporary medicine/health care from clinical settings through mass media. Case studies explore contagion, health policy, the body, death, and biopower. The course requires extensive discussion of readings and an original research project. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-listed with COMM 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5558 - Digital Health Narratives

This course blends readings, discussions and activities about health narratives with digital media production skills to teach students how to create compelling digital stories about health-related topics. Cross-listed with COMM 4558. Restriction: Restricted to degree-granting graduate programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5600 - Media Theory

Surveys a broad array of critical and interpretive approaches to the study of media. Approaches include political economic, semiotic, rhetorical, psychoanalytic, feminist, and cultural. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-listed with COMM 4600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5601 - You Are What You Eat: Food as Communication

Because food provides a communication channel for much of who we are as individuals, as a community and as a society this course analyzes food as a form of communication. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-listed with COMM 4601. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5620 - Health Risk Communication

Acquaints students with contemporary theory, research, and practice in health risk communication. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4620, HBSC 5620, ENVS 5620, and PBHL 4620. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5621 - Visual Communication

Explores the social, cultural, and behavioral effects of visual images in a variety of contexts, including graffiti, film, advertising, art and architecture. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4621. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5665 - Principles of Advertising

Provides a fundamental understanding and appreciation of advertising in today's global society, including consumer motivation, buying behavior, research, creative development and media planning. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll with permission of instructor. Cross-listed with COMM 4665. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5680 - Mass Communication Law and Policy

Covers issues of mass communication and the law and ethics, including issues of the First and Fourth Amendments, communication regulations, intellectual property, public access and obscenity. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5681 - Communication Issues in Trial Court Practices and Processes

Introduces students to communication and language research aimed at improving the fairness, reliability, and validity of court and judicial processes, including lawyer-client interviews, interrogatories, jury selection, jury instructions, witness examination, and the use of language evidence in court. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4681. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5682 - Political Communication

Examines the communication processes involved in mediated political events. Topics include the stages of the campaign process, media coverage of the political campaign process, and literacy skills needed to understand political advertising. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4682. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5700 - Writing Practicum

Methods course focused on strategies of research design and writing for undergraduate students working on theses for Latin honors and for master's students seeking to complete a major research paper or thesis. Cross-listed with COMM 4700. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5710 - Topics in Communication

Special classes for faculty-directed experiences examining communication issues and problems not generally covered in the curriculum. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4710. Max hours: 15 Credits. **Semester Hours:** 1 to 3

COMM 5720 - Dynamics of Global Communication

Explores the word "global" in a communication context by analyzing the relationships between world media, international events, economics and the geopolitics of culture. This analysis is supported by the application of mass, human and cultural communication theory. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-list COMM 4720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5750 - Legal Reasoning and Writing

Introduces the fundamentals of legal reasoning and legal argumentation through intensive class discussion, formal debate and writing. Attention is given to the relationship between case and statutory law and their application in trial and appeals courts in the United States. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4750, PSCI 4757, 5747. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5760 - New Media

Analysis and discussion of the nature, use, and effects of computer-mediated communication in interpersonal, work, educational, societal and international contexts. Focus is on the social aspects of computer-mediated communication rather than on specific software or hardware technologies. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4760. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 5840 - Independent Study

Prereq: Permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

COMM 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

COMM 5939 - Internship

Applies communication or technical communication concepts and skills in supervised employment situations. Max hours: 9 Credits. **Semester Hours:** 1 to 6

COMM 5995 - Travel Study

Students study various topics in a foreign country led by a CU-Denver instructor; register through the Office of International Education. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Undergraduates with senior standing may enroll by permission of instructor. Cross-listed with COMM 4995. Max hours: 15 Credits. **Semester Hours:** 1 to 15

COMM 6013 - Introduction to Graduate Work in Communication

Designed to familiarize students with the philosophical, ideological, and methodological bases of study in communication. Note: Required of all graduate students in M.A. program in communication. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 6200 - Communication and Critical Theory

This course offers students an introduction to the intellectual history and current status of the relationship between communication and critical theory; canonical thinkers (Marx, Freud, Adorno, etc.) are coupled with contemporary communication scholars who work on questions of social justice. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 6400 - Communication, Globalization and Social Justice

This course offers students an introduction to the intersections of communication as a discipline, globalization as a world process, and social justice as a contested, ever-evolving goal of activists. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max Hours: 3 Credits. **Semester Hours:** 3 to 3

COMM 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

COMM 6960 - Master's Project

Max hours: 3 Credits. **Semester Hours:** 1 to 3

COUN 5000 - Human Sexuality

Students will become familiar with human sexuality across the life span. Ecological and family systems theories will provide an understanding of human sexuality from a systemic perspective. Implications for working with individuals, families, and couples will be examined. Prereq: COUN 5010. Cross-listed with HDFR 4000. **Semester Hours:** 3 to 3

COUN 5010 - Counseling Theories

Focuses on counseling theories: Psychodynamic, Adlerian, Person-Centered, Existential, Behavioral, including DBT, Cognitive Behavioral, Gestalt, & Reality Therapy. Also includes an overview of the history of the counseling profession and the role and function of counselors in various settings. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5050 - Foundations of Student Affairs

This course examines theories of college student development including student learning and growth during the postsecondary years. This course will provide an introduction to psychosocial, cognitive, moral, and social identity development theories used to explain college student development. Cross-listed with HDFR 4050. Max hours: 6 Credits. **Semester Hours:** 3 to 3

COUN 5070 - Law and Ethics in Higher Ed and Student Affairs

This course will introduce students to the laws that impact college students and institutions of higher education. Graduate students will obtain knowledge of and the necessary skills to apply a code of ethics to their practice in student affairs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5100 - Techniques of Counseling

Students practice basic counseling skills, develop therapeutic intervention strategies, and improve the effectiveness of their communication by practicing listening and responding. Videotaped role-plays are utilized. Prereq: COUN 5010 and 5810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5110 - Group Counseling

Learn group theory and dynamics. Practice facilitating a group. Learn about screening, group membership and styles, roles and behavior, termination of groups. Extensive practice in laboratory setting. Prereq: COUN 5010, COUN 5100 and 5810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5120 - Counseling Grief and Loss

This elective course is an introduction and study of the field of bereavement in counseling. Studies focus on relating to client's experience with grief, loss and/or trauma through lectures, speakers, videos, readings, experiential in-class simulations, self-discovery and introspection. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5130 - College Student Development

This course examines theories of college student development including student learning and growth during the postsecondary years. This course will provide an introduction to psychosocial, cognitive, moral, and social identity development theories used to explain college student development. Cross-listed with HDFR 4130. Max hours: 6 Credits. **Semester Hours:** 3 to 3

COUN 5150 - Family Counseling/Therapy

Introduces systemic and family theories and intervention strategies. Emphasis on historical development of systems theory. Prereq: COUN 5010 and 5810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5160 - Techniques in Family Counseling/Therapy

This didactic and experiential course presents an overview of techniques and theories in family therapy. It will help students continue to develop a theoretical framework for engaging in theory driven therapeutic interventions via practice family therapy role plays Prereq: COUN 5010, 5100 and 5150. Max hours: 3 Credits **Semester Hours:** 3 to 3

COUN 5170 - Issues In Family Studies

This is a family studies course that is both didactic and experiential. It is designed to assist you to become more informed about contemporary family issues that affect you, your clients, and society. The course major components include: theories of "normal" family processes and life cycle development, family composition, and social issues that impact families and family therapy. Prereq: COUN 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5180 - Counseling Couples

This course is didactic and experiential dealing with therapeutic techniques applied to the improvement of intimate/couple relationships. Emphasis is placed on empirically based assessment, diagnosis, and treatment of couples' problems. Special topics include: co-habiting couples, gay and lesbian couples, remarried couples, cross-cultural couples, ethical and moral dimensions of couple counseling, unique couple issues, and the effectiveness of couple therapy. Prereq: COUN 5010, 5100 and 5150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5280 - Addictions Counseling

Includes treatment strategies for clinicians in addressing varieties of addictive behaviors including substance, abuse, eating disorders, gambling and sexual addiction. Cultural dimensions of addictions are also considered. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5330 - Counseling Issues and Ethics

An in-depth examination of ethical and legal issues in the field. Topics include working with individuals and family systems, licensure, professional associations, record keeping and statutory requirements. Prereq: COUN 5010 and 5810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5400 - Career Development

Development of competencies in career development counseling. Theories of work systems, psychological dynamics, information systems, and decision making models are covered. Interacting with work or family systems and other subsystems is emphasized. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5425 - Developing & Implementing a School Counseling Program: ASCA

The course is specifically designed to provide training for school counselors and related professionals to develop and implement a comprehensive counseling and guidance program, which incorporates the ASCA National Model. Prereq: COUN 5010 and 5815, EPSY 6200, RSEM 5110 and 5120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5500 - Diversity, Inclusion, Social Justice in Higher Education

An examination of society, media, and public and educational policy and their impact on higher education access and persistence for marginalized groups. Students are called to consider how student affairs professionals might promote social justice for marginalized student groups. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5810 - Multicultural Counseling Issues for Individuals and Families

Offers introduction to competent multicultural and social justice counseling. Students develop the awareness, knowledge, skills and action competences necessary for culturally responsive interventions with diverse communities. The course explores issues of ethnicity, culture, age, disability, and sexual orientation and learn about multicultural and social justice interventions for addressing these issues in counseling. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5815 - Introduction to School Counseling

This course emphasizes the unique and varied role of the school counselor and school counseling programs in diverse public schools. The course focus will be on learning the various skills necessary to meet the needs of school age students and others in the school community. In addition, the course will cover The ASCA model of comprehensive developmental school counseling activities, and focus on practical resources for counseling students in diverse school settings. Prereq: COUN 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5820 - Strategies of Agency Counseling

Students learn the role and function of the counselor in community agency settings. Intervention strategies, consultation, administration of community mental health agencies. Prereq: COUN 5010 and 5810. Max hours: 6 Credits. **Semester Hours:** 3 to 6

COUN 5825 - The Business Of Private Practice

This course is designed to teach students how to start and manage a successful private practice in counseling. Emphasis

is placed on understanding and navigating the business side of professional counseling. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5830 - Special Topics

Specific topics vary from semester to semester. Intervention strategies with children, issues in abuse, violence, incest, legal issues, adult counseling, grief, death and dying, private practice. Max hours: 6 Credits. **Semester Hours:** 1 to 6

COUN 5835 - Gender And Sexual Orientation

Investigates constructions of gender and sexuality in the systemic context of individuals, relationships, families, and culture. Emphasis will be placed on developing critical thinking and clinical skills that engage diverse clients in a respectful, ethical, and effective manner in therapy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5840 - Independent Study: COUN

Individually directed research activity on special topics not covered by course offerings. Degree students only, with advance approval by major, professor and department chair. Max hours: 9 Credits. **Semester Hours:** 1 to 4

COUN 5910 - Practicum in COUN

Supervised counseling practice in the counseling lab and appropriate settings (150 clock hours). Emphasis on individual and group counseling techniques and therapeutic intervention strategies. Prereq: all counseling course work must be completed. Max hours: 6 Credits. **Semester Hours:** 6 to 6

COUN 5915 - Practicum in School Counseling

This class will provide school track students with 3 credits of fieldwork at a developmental level of their choice. The course will require students to work with a school counselor activities that the counselor is assigned under supervision. Students will develop skills in needs assessment, developing classroom guidance activities and running the activities; they will sit in on IEP conferences, help conduct college fairs, administer career assessment inventories and standardized assessments, learn to place students in appropriate classes, and provide responsive counseling services on an as needed basis. Prereq: COUN 5010, COUN 5110, COUN 5400, COUN 5420, COUN 5810, COUN 5815, COUN 6220. Restriction: Restricted to CPCE majors with all sub plans within the School of Education and Human Development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 5930 - Internship in Counseling

Psychology and Counselor Education. Supervised internship of 600 clock hours. Intern performs activities of a regularly employed professional in an approved community site. Prereq: COUN 5910. Restriction: Restricted to CPCE-MA majors. Students must register for 3 or 6 credit hours. Max hours: 12 Credits. **Semester Hours:** 3 to 6

COUN 6000 - Introduction to Sex Therapy

Provides an overview of human sexuality over the life cycle, addressing social, psychological, and physiological aspects of human sexuality. Etiology of human sexuality diagnoses and treatment of problems related to human sexuality are addressed. Note: This course is a component in the couple and family program and required for MFT licensure. Prereq: COUN 5010, COUN 5100, COUN 5110, COUN 5150. Prereq or Coreq: COUN 5160. Restriction: Restricted to CPCE majors within the School of Education and Human Development. Max hours: 3 Credits. **Semester Hours: 3 to 3**

COUN 6100 - Spiritual Dimensions of Counseling

A didactic and experiential course involving the following content areas: theories of spiritual development, a survey of religious traditions, assessment, ethical issues, self-of-the-therapist issues, and treatment interventions and strategies in working with clients' values. Max hours: 3 Credits. **Semester Hours: 3 to 3**

COUN 6140 - Counseling Children, Adolescents and Their Parents

A didactic and experiential course addressing child, adolescent, and parental/family issues. Counseling techniques, including play therapy, and parent education are taught and practiced. Assessment tools and specific strategies are used to increase positive family relationships. Prereq: COUN 5010, COUN 5100, COUN 5150 and EPSY 6200. Max hours: 3 Credits. **Semester Hours: 3 to 3**

COUN 6160 - Advanced Assessment: Theory and Treatment in Family Systems

This is a didactic and experiential course focusing on family assessment instruments and their use in family therapy. Emphasis is placed on the role of assessment in family therapy, the relationship of assessment to treatment planning and evaluation, gaining familiarity with a variety of assessment instruments, and learning to apply assessment skills to real-world clients. Prereq: COUN 5010, 5100, 5150, 5160, and RSEM 5110. Max hours: 3 Credits **Semester Hours: 3 to 3**

COUN 6230 - Developmental Counseling in Schools: Prevention & Intervention

This course offers the tools to provide developmental counseling services in the schools, including prevention through classroom counseling activities linked with the curriculum, and responsive services. Prereq: COUN 5100, 5110, 5400, 5810, EPSY 6200, RSEM 5110 and 5120. Max hours: 3 Credits. **Semester Hours: 3 to 3**

COUN 6240 - Consultation Strategies

Focuses on the development of consultation skills and implementation of strategies. Students are exposed to major theories of the consultation process. In addition, this course provides the opportunity to practice consultation and implementation strategies within a system: an agency, business setting, or educational setting. Prereq: COUN 5010 or permission of instructor. Restriction: Restricted to CPCE majors with all sub plans within the School of Education and Human Development. Max hours: 3 Credits. **Semester Hours: 3 to 3**

COUN 6250 - Mental Health Diagnosis

This course addresses individual diagnosis from a variety of perspectives: Biological, developmental, medical, neurological, psychosocial, cultural and interpersonal. It will provide students with a broad theoretical base for understanding psychopathology, from not only an individual, descriptive, symptom-based perspective as presented in the DSM-5, but also from a contextual systemic perspective including developmental hallmarks, familial patterns and socio-cultural contributors. Prereq: COUN 5010 and 5810. Restriction: Restricted to CPCE and EPSY majors and all sub plans within the School of Education and Human Development. Cross-listed with EPSY 6250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 6310 - Facilitating Sociopolitical Development Theory & Actn

Participants will learn to use dialogic instructional strategies to create student-teacher partnerships that respect student voice and affirm the lived experiences of students. Participants will learn strategies to engage students and themselves in critical inquiry about identity, privilege, and social justice. Cross listed with COUN 7310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 6320 - Participatory Research Methods in Context

This course will introduce students to participatory research methods, including Youth Participatory Action Research (YPAR), PAR, youth participatory evaluation, and design based research. Graduate students will study current examples of this work, design, and conduct a study in their professional context. Cross listed with COUN 7320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 6330 - Advanced Seminar in Counseling and Psychotherapy

Professional analysis of major trends in counseling and psychotherapy. Specific emphasis topics identified. Prereq: COUN 5010, 5100 and 5330. Restriction: Restricted to CPCE majors with all sub plans within the School of Education and Human Development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 6350 - Theories of Personality Development and Change

An advanced course in personality theory with a focus on assumptions of each theory and each as a mechanism for change. Implications of each theory for personal growth and therapy's addressed. Cross-listed with EPSY 6350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 6810 - Advanced Multicultural Counseling

Offers essential preparation for competent multicultural and social justice counseling practice with culturally diverse clients, and families. Students learn about effective multicultural counseling and advocacy skills. The course explores the impact of ethnicity, culture, age, disability, sexual orientation, etc., on individual behavior, interpersonal relationships, and learn about multicultural and social justice interventions and techniques for addressing these issues in counseling. Prereq: COUN 5010, 5100 and 5810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 6840 - Independent Study

Max hours: 4 Credits. **Semester Hours:** 1 to 4

COUN 6910 - Advanced Practicum in Counseling

Max hours: 12 Credits. **Semester Hours:** 3 to 6

COUN 6950 - Master's Thesis

Max hours: 4 Credits. **Semester Hours:** 4 to 4

COUN 7100 - Advanced Theories and Techniques in Psychotherapy

Learn and practice advanced techniques for addressing adult and adolescent clinical problems. Examine efficacy research on specific counseling techniques as associated with particular approaches in counseling. Prereq: COUN 5010, 5100 and 5820. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 7310 - Facilitating Sociopolitical Development Theory & Actn

Participants will learn to use dialogic instructional strategies to create student-teacher partnerships that respect student voice and affirm the lived experiences of students. Participants will learn strategies to engage students and themselves in critical inquiry about identity, privilege, and social justice. Cross listed with COUN 6310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 7320 - Participatory Research Methods in Context

This course will introduce students to participatory research methods, including Youth Participatory Action Research (YPAR), PAR, youth participatory evaluation, and design based research. Graduate students will study current examples of this work, design, and conduct a study in their professional context. Cross listed COUN 6320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

COUN 7800 - Supervision in Counseling and Psychotherapy

Examines training principles, processes, and practices in clinical supervision. Emphasis on individual and family therapy supervision. Prereq: COUN 5010, 5100, 5910 and 5930. Restriction: Restricted to CPCE majors with all sub plans within the School of Education and Human Development. Max hours: 12 Credits. **Semester Hours:** 3 to 3

CRJU 1000 - Criminology and Criminal Justice: An Overview

This course is designed to provide an overview of the criminal justice process and the criminal justice system in general. Concepts of crime, deviance and justice are discussed and general theories of crime causality are examined. Special emphasis is placed on the components of the criminal justice system: the police, the prosecutorial and defense functions, the judiciary and the field of corrections. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 1111 - Freshman Seminar

This course explores contemporary issues and cases in the criminal justice system. Topical issues cover various forms of crime; including environmental hazards, mass murder, and sexual assault. The course also focuses on current controversies in policing, courts, corrections, and the juvenile justice system. Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 2041 - Crime Theory and Causes

This course provides a general survey of the nature and causes of crime and efforts of the criminal justice system to predict, prevent, modify and correct this behavior. This course involves a critical appraisal of various theories of crime causation, including an examination of biological, psychological, economic and sociological perspectives that explain crime and deviance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3100 - Criminal Justice Research Methods

This course introduces students to the formulation of research questions covering crime and justice, research designs, data collection and the interpretation and reporting of these data in criminological and justice-system settings. Course content also includes experimental and non-experimental research designs, probability and non-probability sampling techniques and construction of scales and indexes for research purposes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3150 - Statistics for Criminal Justice

This course serves as an introduction to descriptive and inferential statistics and the computer analysis of criminal justice data. Course content includes hypothesis testing and the basic analysis of continuous and discrete dependent variables. Emphasis is placed on the examination of issues in the field of criminal justice. Prereq: CRJU 3100 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3160 - White-Collar Crime

This course introduces students to a variety of topics and issues in white-collar crime including types, causes and the measurement of white-collar crime. The class examines the debate surrounding the definition of white-collar crime, provides an overview of the costs of white-collar crime and corporate crime to society, considers competing theories that explain white-collar criminality and explores the use of criminal sanctions to deter misconduct involving corporations and elite offenders. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3220 - Community-Based Corrections

This course focuses on innovative community-based strategies for dealing with criminal offenders. Correctional alternatives to imprisonment discussed in this course include probation and parole and various community programs such as day reporting centers, electronic monitoring, half-way houses and boot camp programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3250 - Violence in Society

This course examines various aspects of violence including distribution over time and space, situations and circumstances associated with violent victimization and offending and how social institutions, community structure and cultural factors shape violent events. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3251 - Crime and Media

This course surveys the relationships between mass media, crime, offenders, victims and criminal justice. It explores how the criminal justice system is portrayed in the media and the influence of these portrayals on society, public policy, and the criminal justice system. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3252 - Violent Offenders

This course consists of a historical overview of violence in American society. Course content includes an examination of violent crime rates over time, societal explanations for changes in rates and an examination of the theoretical causes and preventative strategies for acts of violence. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3310 - Police in Contemporary Society

This course examines law enforcement's role in contemporary society and the impact of police interaction on other segments of the criminal justice system. Special attention is paid to controversies related to police training and education, career development and community relations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3320 - Police-Community Relations

This course focuses on the police and community response to crime. Course content includes an overview of the major concepts and issues involved in what many consider to be a major fundamental shift in the approach and operations of modern policing. The origins, meaning, development and experiences of community policing and various assessments of the advantages and disadvantages of community policing are emphasized. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3410 - Probation and Parole

This course is appropriate for students who have a specific interest in the role of probation and parole as correctional sanctions in community settings. Particular attention is paid to evaluations research evidence on the success of probation and parole, factors that contribute to the successful completions of probation and parole and the role that the community and citizens play in the community corrections process. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3420 - Pleas, Trials and Sentences

This course focuses on analysis of case materials involving pleas, trials and sentences. Course content includes an examination of the basic dimensions of criminality, the specific elements of major crimes, the use of confessions, fair trial procedures and the nature of criminal sanctions including cruel and unusual punishments. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3510 - Drugs, Alcohol and Crime

This course looks at the socially constructed nature of drugs and drug policy. The course explores the connection between drugs and crime within the socio-historical context of contemporary U.S. drug policy. Special emphasis is placed on the relationships between drugs and alcohol abuse and criminal offending, including the historical and contemporary criminal justice system responses to illegal substances. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3520 - Juvenile Justice Administration

This course examines the development, change and operation of the American juvenile justice system and the social factors that shape the identification and treatment of juvenile offenders. Special emphasis is placed on the nature of juvenile law and methods of dealing with youthful offenders. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 3540 - Crime and Delinquency Prevention

This course provides students with an overview of issues related to crime and delinquency prevention, both from criminological and criminal justice points of view. Crime prevention programs that encompass both the individual and community levels are examined. Responses to juvenile offenders-ranging from prevention and diversion to institutional corrections and after care are explored in context of youth policy generally. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4042 - Corrections

This course consists of an overview of the field of penology and corrections. Attention is paid to conflicting philosophies of punishment, criminological theory as it applies to the field of corrections, the selectivity of the process through which offenders move prior to their involvement in correctional programs, alternative correctional placements and empirical assessments of the short and long-term consequences of one's involvement in correctional programs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4043 - Law Enforcement

This course presents an overview of the role of police in the United States. Attention is placed on the origins of policing, the nature of police organizations and police work, patterns of relations between the police and the public, discretion and police role in a sociolegal context. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4044 - Courts and Judicial Process

This course examines the basic functions, structure and organization of the federal and state court system, with special attention on the criminal court system. This course also focuses on the influence of judicial behavior on the court process by examining judges' policy preferences, legal considerations, group processes within courts and courts' political and social environments. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4120 - Race, Class and Crime

This course examines the relationships between race, social class and crime. Attention is given to theoretical explanations, empirical research and patterns of criminal behavior and focuses on historical frameworks that are relevant to current perspectives on the impact and interactions of race, class and crime in the field. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4121 - Ethics in Criminal Justice

This course is designed to begin preparing students in identifying and critically examining ethical issues in the criminal justice system by applying ethical decision models. This course also provides students with the unique opportunity to analyze how they would resolve these issues according to their own values and beliefs while staying within the boundaries of the law and professional codes ethics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4130 - Poverty and Crime

This course involves an economic analysis of crime and the criminal justice system. Topics include empirical and theoretical analysis of the economic causes of criminal behavior, the social costs of crime and its prevention and the design of crime enforcement policies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4140 - Domestic Violence and Crime

This course examines the criminal justice systems response to intimate partner violence by focusing on the interactions between victims, offenders and the individual components of the criminal justice system. By exploring the dynamics of intimate partner violence this course addresses the theory, history, research, legislation and policy implications related to the criminal justice system's response to violence against women. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4150 - Sex Offenders and Offenses

This course will explore historical and current practices of the criminal justice system to address sex offenders and offenses. Topics include the history of sexual abuse, etiology of offenders, victims issues, juvenile sex offenders, risk assessments, and treatment/supervision approaches. Prereq: CRJU 1001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4170 - Victim Studies

This course involves the scientific study of crime victims and focuses on the physical, emotional and financial harm people suffer at the hands of criminals. Focus is placed on the victim-offender relationships, interactions between victims and the criminal justice system and connections between victims and other social groups and institutions. The theory, history, research, legislation and policy implications related to the social construction of "the victim" are explored. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4171 - Murder 101

Murder. The ultimate crime. In this class, we will examine homicide from all angles: the murderer, the victims, the police, prosecution and defense. Explore sensational cases, dogged detective work and the latest science as we dig deep into the psyche of a killer and how the case unfolds before the jury. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4180 - Comparative Study of Criminal Justice Systems

This course analyzes the dynamics of criminality and the social response to criminality across countries. Special emphasis is placed on the methods of comparative legal analysis utilized to examine international differences in crime and justice, international cooperation in criminal justice and crime and development. Prereq: CRJU 1001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4190 - Women and Crime

This course explores issues surrounding women as offenders and victims, and investigates explanations for the involvement of women in illegal activities. The course also examines the participations of women in criminal justice professions, including law enforcement, corrections, judicial processes, and law. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4230 - Corrections and Treatment

This course examines the origins and historical development of prisons and jails in America. Particular attention is given to the impact of reform movements, the rise of centralized correctional systems and regional variations in the practice of punishment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4252 - Criminal Offenders

This course will introduce the core principles of evidence based programming and tools of motivational interviewing as it is used currently with the offender population. In addition, students will learn how to utilize these skills working with specific offender populations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4310 - Leadership Roles in Criminal Justice

The course is designed to enhance interest, experience and knowledge in leadership that promotes professionalism and ethical behavior. Individual and organizational dynamics are explored through a critical perspective, focusing on criminal justice roles and responsibilities. The class teaches effective leadership skills in areas such as team building, strategic planning, and decision making. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4410 - Criminal Law and Constitutional Procedures

This course focuses on substantive criminal law and constitutional rights of the accused in criminal proceedings. Course content includes legal aspects of the investigation and arrest processes as well as the rules governing the admissibility of evidence in court. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4430 - Law and Society

This course introduces students to the scholarly study of law. Students will become familiar with social science perspectives of the law, legal institutions, the legal process and the impact of law on behavior, with particular emphasis

on the study of criminal behavior and the criminal justice process in American society. Additional topics include theories of law and legality, comparative legal systems, lawyers, judges and juries and the use of social science in the courts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4440 - Courts and Social Policy

This course involves the study of emerging trends and issues in the administration of the courts, the emerging role of the judiciary in the administration of programs in the public and private sectors and the implications of court administration on social policy. Course content includes the history of the judicial approaches to the criminal justice administrative process and substantive social policy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4450 - Homeland Security

This course is an in-depth analysis of homeland security in the U.S. Topics include the initial concepts and strategies of securing land borders, seaports, and airports, the establishment of the Department of Homeland Security, and the functions and operations of the DHS today and in the future. Prereq: CRJU 1001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4520 - Gangs and Criminal Organizations

This course traces the origins and historical development of the activities known as "organized crime." These crimes are some of the most dangerous to American society and range from the commonly known offenses of gambling and narcotics to the more subtle and sophisticated, less understood but equally serious, crimes of extortion, commercial bribery and political corruption. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4530 - Families and Intergenerational Crime

This course focuses on the family as the primary institutional mechanism of social control. The course is structured around social learning theory and explores the relationships between exposure to childhood violence and violence in dating relationships during adolescence and later violent marital relationships. The "cycle of violence" is also discussed in terms of the impact on early childhood violence on juvenile delinquency, adult criminality and violent behavior in general. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4540 - Analysis in Law Enforcement

Serves as an introduction to the uses and applications of analysis within law enforcement including the role of analysis in law enforcement, theories which guide analysis and police practices, commonly used data and technology, and a practical introduction to the techniques for various types of analysis utilized in law enforcement. Prereq: "C-" or better in CRJU 1000, 2041, 3100, 3150, 4042, 4043, and 4044. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 4600 - Special Topics in Criminal Justice

This highly specialized seminar addresses cutting-edge and emerging developments in the field of criminal justice and provides students and faculty with the opportunity to explore significant themes, issues and problems from a broad

interdisciplinary perspective. Topics vary from semester to semester. Prereq: CRJU 1001 and CRJU 2041 or permission of instructor. Max hours: 18 Credits. **Semester Hours:** 3 to 3

CRJU 4840 - Independent Study: CRJU

This course consists of faculty-guided research in an area of mutual interest to the student and instructor. Students are responsible for selecting their area of inquiry prior to contacting the instructor. Permission of instructor is required. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CRJU 4939 - Internship

Internships involve a career-related supervised experiential course in a criminal justice agency. Permission to enroll must be preceded by an application for an internship. Permission of instructor and advisor is required for undergraduate students. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CRJU 5001 - CJ Systems, Policies/Practice

This course examines the salient, current critical issues in the justice system affecting law enforcement, courts, corrections, and recent social developments related to personnel. The class includes in-depth explorations of the development, implementation, and analysis of public policy in the field of criminology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5002 - Criminological Theory

Explores the origins of criminal behavior and the impact of crime on society. The course examines theories of deviant, delinquent, and criminal behavior. Additionally, practical implications and application of theoretical constructs are analyzed through current research paradigms and empirical research. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5003 - Research Methods

Provides an assessment of research through an examination of applied designs and analytical models. The logic and rationale of these strategies are contrasted and their relative merits are critiqued. Research problems in the system are utilized to illustrate the applications and interpretation of alternative strategies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5004 - Statistics

This course covers principles of descriptive and inferential statistics and provides tools for understanding research findings. Topics include: hypothesis testing and point estimation; bivariate and multivariate measures of association; inferential statistics; ordinary least square regressions, logistic regression analyses. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5005 - Law & Society

Introduces a variety of topics related to law's varying functions and societal implications. The course focuses on social/legal theory and analyzes law and legal institutions from a critical perspective. Materials provide content on how to evaluate law and legal institutions, especially in relation to equality, justice, and fairness. Max hours: 3 Credits.

Semester Hours: 3 to 3

CRJU 5200 - Wrongful Convictions

This seminar examines the dark figure of the criminal justice system; wrongful convictions of innocent people. This course explores the continuum of justice-system errors ranging from persons who are falsely accused (arrested, prosecuted, and tried) to those who are wrongly convicted and imprisoned, to death row inmates who are erroneously executed. Cross-listed with CRJU 7200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5210 - Prisoner Reentry

This seminar examines the harsh realities of prisoner reentry and offers solutions to prepare inmates for release, reduce recidivism, and restore them to adjustment once back in the community, while simultaneously meeting the demands of public safety. Cross-listed with CRJU 7210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5220 - The American Jury System

This seminar examines historical and current issues in jury decision making and dynamics. The course explores issues such as jury size, eyewitness testimony, and jury reform. Court decisions are examined as a comprehensive understanding of jurors and their role. Cross-listed with CRJU 7220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5250 - Criminal Offenders

Crime can have a devastating effect on the lives of victims, families and communities with extraordinary costs to society as a whole. Documented evidence suggests that community safety is best achieved through promoting rehabilitation of offenders rather than relying solely on prisons and containment. This course introduces the core principles and tools of motivational interviewing as it is used currently with the offender population. Students learn how to utilize these skills working with specific offender populations and how to motivate these often resistive clients to change their thinking patterns and behaviors. Cross-listed with CRJU 7250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5260 - Crime and Literature

This seminar focuses on non-fiction literature as it relates to criminality and the Criminal Justice System. A substantial number of people in the United States form impressions and evaluate the effectiveness of the Criminal Justice System based on accounts presented within various types of nonfiction literature, either as social commentary or in biographical/autobiographical form. This course explores samples of these types of commentary, in order to more fully understand and appreciate their impact on shaping public opinion of the Criminal Justice System. Cross-listed with CRJU 7260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5270 - Case Studies in Crim Justice

This seminar attempts to examine the lives of people who live on the margins of a society that perceives them as outsiders. Ethnographic studies which utilized observation, participant observations and interviews as their primary research methodology are assigned in order to develop a critical understanding of the social marginalization and cultural aspects of the lives of real human beings living on the constant edge of the law. Cross-listed with CRJU 7270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5280 - Computer Crime

The course is designed to enhance interest, experience and knowledge in leadership that promotes professionalism and ethical behavior. Individual and organizational dynamics are explored through a critical perspective, focusing on criminal justice roles and responsibilities. The class teaches effective leadership skills in areas such as team building, strategic planning, and decision making. Cross-listed with CRJU 7280. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5301 - Crime and Media

This course surveys the relationship between mass media and the U.S. criminal justice system. Special attention is given to the role of media in the social construction of reality. Emphasis is placed on the application of social constructionism to criminal justice related social problems. Cross-listed with CRJU 7301. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5320 - Police Administration

Considers the major issues confronting police executives, such as professionalism, recruitment, selection, training, deployment, innovation, evaluation, and charges of brutality, inefficiency, and corruption. Cross-listed with CRJU 7320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5325 - Qualitative Methods for Criminal Justice

Focuses on qualitative methods applicable to research in the field of criminal justice. The primary focus is on ethnographic approaches employing such fieldwork techniques as observation, participant observation, interviews, content analysis, life histories and case studies. Cross-listed with CRJU 7325. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5330 - Gangs and Criminal Organizations

This course examines extent, nature and trends of gangs and criminal organizations. We focus on contemporary studies and theories of gang behavior and organized crime. The course examines types of crime, gender and race issues, transnational violence, and public policies regarding criminal organizations. Cross-listed with CRJU 7330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5331 - Analysis in Law Enforcement

Serves as an introduction to the uses and applications of analysis within law enforcement including the role of analysis in law enforcement, theories which guide analysis and police practices, commonly used data and technology, and a

practical introduction to the techniques for various types of analysis utilized in law enforcement. Prereq: "B" or better in CRJU 5003 and 5004 OR permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5361 - Capstone Seminar

Synthesizes competencies gained throughout the course of study into a client-based research project. Students conduct independent research, complete a final written project demonstrating their qualifications and expertise, and orally present findings to a committee of faculty and criminal justice professionals. Prereq: CRJU 5000, CRJU 5100, CRJU 5120, CRJU 5321. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5391 - Sex Offenders and Offenses

This course will focus on challenges practitioners face in the management of sex offenders. It covers development of programs and partnerships that can effectively assess, inform, manage and treat sex offenders through all phases of the system and reduce recidivism. Cross-listed with CRJU 7391. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5410 - Victimology

This course examines victim-offender relationships, the interactions between victims and the criminal justice system and the connections between victims and other social groups and institutions among various populations. This course addresses the theory, history, research, legislation and policy implications related to the social construction of "the victim." Cross-listed with CRJU 7410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5420 - Violence in Society

This course examines various aspects of violence including distribution over time and space, situations and circumstances associated with violent victimization and offending, and how social institutions, community structure and cultural factors shape violent events. Cross-listed with CRJU 7420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5430 - Drugs, Alcohol and Crime

This course provides an interdisciplinary overview of theory, research and policy issues surrounding the relationship between drugs, alcohol and crime; and the criminal justice system response. The course explores the socially constructed nature of illegal substances and connections to U.S. drug policy. Cross-listed with CRJU 7430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5450 - Law of All Hazards Management

This course conveys knowledge of the statutes, regulations and court decisions governing the management of hazards by governmental agencies. It covers local, state and federal agencies as they mitigate, prepare for, respond to and recover from naturally, accidentally and intentionally caused disasters. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5510 - Contemporary Issues in Law Enforcement

Examines current thinking and experience with respect to changing and reforming police programs and practices. The course focuses primarily on the American police experience, reviewing major innovations, exploring their rationale, and examining organizational impediments to their implementation. Cross-listed with CRJU 7510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5520 - Corrections

Provides a critical examination of the development and implementation of correctional systems in America. The course presents the origins of correctional efforts and the evolution of the prison; reviews punishment and rehabilitation rationales in the context of sentencing models; examines the social organization of the prison, including inmate subcultures and staff work strategies; and assesses the inmates' rights movement and the impact of judicial intervention in correctional settings. Cross-listed with CRJU 7520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5530 - Community Corrections

Analyzes the theories and practices of probation and parole, responses of paroling authorities to public pressures and court controls, and their implications for rehabilitation. Efforts to bridge institutional settings and community life, as well as the feasibility and effectiveness of treating individuals under sentence in the community, are reviewed. Cross-listed with CRJU 7530. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5540 - Juvenile Justice Administration

Examines the policies and practices of agencies in processing youthful offenders through the juvenile court system, reviews trends in juvenile justice policymaking, and assesses changes in response to juvenile crime by both the juvenile justice and criminal justice systems. Cross-listed with CRJU 7540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5550 - Criminal Justice Policy and Planning

Provides a survey of conceptual and design strategies in criminal justice policy analysis. The logic and rationale of these various strategies are contrasted, and their relative merits are critiqued. Selected policy issues in the criminal justice system are utilized to illustrate the application and interpretation of alternative strategies. Cross-listed with CRJU 7550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5551 - Courts, Law & Justice

Analyzes judicial organization, court administration, and criminal court judicial decision making practices within the context of the broader operation of the criminal justice system. Special attention is paid to the social organization of the courtroom, examining the special roles of judges, prosecutors, and defense attorneys. Cross-listed with CRJU 7551. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5552 - Criminal Justice Ethics

Offers a normative framework within which to explore ways to increase sensitivity to the demands of ethical behavior among criminal justice personnel. The application of a normative perspective enhances the possibility that moral

problems are better understood, more carefully analyzed, and rendered more tractable applied ethics forces a reflection not just on ethics, but also on the nature and operation of the criminal justice system itself. Cross-listed with CRJU 7552. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5553 - Women and Crime

Explores issues surrounding women as offenders, victims, and criminal justice professionals. Investigates explanations for the involvement of women in illegal activities. Analyzes the plight of battered women, rape victims, and other female victims. Examines the participation of women in law enforcement judicial processes, corrections and lawmaking. Cross-listed with CRJU 7553. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5555 - Profiling Criminal Behavior

This seminar examines the dynamics of individual criminal acts utilizing inductive and deductive methodology to profile criminal behavior, offender characteristics, crime scene investigation, evidence collection, and case linkage of specific categories of crimes. Topical areas in this seminar will include homicide, serial crime, stalking. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5571 - The Social Organization of Crime

Explores the relationship of neighborhood social disorganization to the dynamics of crime from a social ecology perspective. The course examines the underlying social causes of phenomena such as criminal victimization, violent and property crime, neighborhood fear, neighborhood deterioration, and recidivism. The course examines social, structural, and ecological characteristics of neighborhoods and communities in affecting crime. Cross-listed with CRJU 7571. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5572 - Race, Crime and Justice

Examines the role of race in criminal justice processing. This course examines the research findings, interpretations, issues, and implications in assessing the impact of race in the administration of criminal justice. Explores the policy implications concerning the nature and extent of racial disparities in the criminal justice system and lays out a research agenda to more strategically address these issues within criminal justice policy making. Cross-listed with CRJU 7572. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5574 - White Collar Crime

Employs both the social science and legal approaches to examine crime committed by corporations as well as by individuals in white collar occupations. The course covers how such crimes are socially defined, who commits them, who is victimized by them, which social contexts promote them, and how society and the criminal justice system respond to them. Cross-listed with CRJU 7574. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5575 - The Mentally Disordered Offender

Examines the offender who may be mentally disordered. A survey is made of the various phases of the criminal justice system where psychiatrists are involved, e.g., diversion, fitness, insanity and sentencing. Dangerous sex offender

legislation, "not guilty by reason of insanity" and "guilty but mentally ill" statutes, and issues concerning confidentiality, informed consent, and treatment are addressed. Cross-listed with CRJU 7575. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5576 - Social Science in the Criminal Justice System

Examines the use of social science as a tool for legal analysis within the criminal justice system. The course examines how social science research is used to resolve relatively simple factual disputes, then moves on to more complex issues that arise when social science is invoked to make or to change law, both constitutional law (particularly the First, Sixth, Eighth, and Fourteenth amendments) and common law, particularly the construction of procedural rules that govern the operations of the criminal justice system. Cross-listed with CRJU 7576. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5650 - Public Policies for Homeland Security and Disasters

Examines public policymaking and administration related to homeland security and disasters in the United States, including the interplay between security and traditional hazards management concerns. Assesses the role of institutional processes, governmental and nongovernmental organizations in policy development and implementation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5655 - Principles of Emergency Management

This course is an introduction to the practice of emergency management. It provides instruction on the discipline of emergency management and covers not only administrative practice, but how public policy shapes how governments at all levels address hazards, emergencies and disasters. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5910 - Nature and Scope of Interpersonal Violence

This course will analyze the social, historical, political, legal, and psychological aspects of gender based violence. Topics addressed include: definitions of the problem, demographics, children and youth exposed, national and global perspectives. Strategies for prevention, intervention, treatment, and social change are explored. Cross-listed with CRJU 7910 and PUAD 5910. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5920 - The Psychology of Interpersonal Violence

This class addresses the contributions and limitations of current empirical and clinical psychological literatures about interpersonal violence (IPV). The primary focus of the course is on the effects of IPV on adult and child survivors, on their psychological needs, and on the contribution of psychological knowledge to practice in IPV. Cross-listed with CRJU 7920 and PUAD 5920. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5930 - Interpersonal Violence Law and Public Policy

This course provides insight into public policy and law affected by or affecting interpersonal violence, (welfare reform, child maltreatment, criminal and civil court responses). Students will understand the role of law enforcement agents and the practice of victim advocacy, and describe and engage in methods to change law and policy. Cross-listed with CRJU 7930 and PUAD 5930. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 5940 - Interpersonal Violence, Advocacy, and Social Change

Students will gain an understanding of different models of social change and the various approaches to public address, including social movements and campaigns, that accomplish change. Strategies for engaging diverse individuals, systems and communities to address interpersonal violence will be examined at individual to societal levels. Cross-listed with CRJU 7940 and PUAD 5940. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 6171 - Murder 101

Murder. The ultimate crime. In this class, we will examine homicide from all angles: the murderer, the victims, the police, prosecution and defense. Explore sensational cases, dogged detective work and the latest science as we dig deep into the psyche of a killer and how the case unfolds before the jury. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 6600 - Special Topics in Criminal Justice

This highly specialized seminar addresses cutting-edge and emerging developments in the field of criminal justice and provides students and faculty with the opportunity to explore significant themes, issues, and problems from a broad interdisciplinary perspective. Topics vary from semester to semester. Course may be taken for credit more than once, provided subject matter is not repeated. Cross-listed with CRJU 7600. Max hours: 7 Credits. **Semester Hours:** 3 to 3

CRJU 6840 - Independent Study: CRJU

Affords the student the opportunity to pursue creative research activities under the individual supervision of a full-time faculty member. No more than six semester hours of credit for independent study may be applied toward the MCJ degree. MCJ Prereq: 12 semester hours of criminal justice course work and permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

CRJU 6910 - Internship in Criminal Justice

For students who have not had practitioner experience, a full- or part-time internship is required. Note: Masters students must have completed a minimum of 18 credit hours at the graduate level to take this course. Dual Degree students must have completed a minimum of 6 credit hours at the graduate level. Minimum cumulative GPA of 3.0 required to take this course. Restrictions: Restricted to Graduate and Graduate Non-Degree majors within CU Denver. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 6950 - Master's Thesis

Independent original research project supervised and evaluated by a thesis committee. Prereq: 33 semester hours of course work and permission of MCJ director, program advisor and thesis chair. Max hours: 6 Credits. **Semester Hours:** 3 to 6

CRJU 7200 - Wrongful Convictions

This seminar examines the dark figure of the criminal justice system; wrongful convictions of innocent people. This course explores the continuum of justice-system errors ranging from persons who are falsely accused (arrested, prosecuted, and tried) to those who are wrongly convicted and imprisoned, to death row inmates who are erroneously executed. Cross-listed with CRJU 5200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7210 - Prisoner Reentry

This seminar examines the harsh realities of prisoner reentry and offers solutions to prepare inmates for release, reduce recidivism, and restore them to adjustment once back in the community, while simultaneously meeting the demands of public safety. Cross-listed with CRJU 5210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7220 - The American Jury System

The aim of this seminar is to raise most of the issues that have to be considered by anyone who wants to understand the American jury. This course attempts to determine what kind of complex matrix of legal functions, social symbols, practical reforms, political philosophy and human psychology the jury can be located. Cross-listed with CRJU 5220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7250 - Criminal Offenders

Crime can have a devastating effect on the lives of victims, families and communities with extraordinary costs to society as a whole. Documented evidence suggests that community safety is best achieved through promoting rehabilitation of offenders rather than relying solely on prisons and containment. This course introduces the core principles and tools of motivational interviewing as it is used currently with the offender population. Students learn how to utilize these skills working with specific offender populations and how to motivate these often resistive clients to change their thinking patterns and behaviors. Cross-listed with CRJU 5250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7260 - Crime and Literature

This seminar focuses on non-fiction literature as it relates to criminality and the Criminal Justice System. A substantial number of people in the United States form impressions and evaluate the effectiveness of the Criminal Justice System based on accounts presented within various types of nonfiction literature, either as social commentary or in biographical/autobiographical form. This course explores samples of these types of commentary, in order to more fully understand and appreciate their impact on shaping public opinion of the Criminal Justice System. Cross-listed with CRJU 5260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7270 - Case Studies in Criminal Justice

This seminar attempts to examine the lives of people who live on the margins of a society that perceives them as outsiders. Ethnographic studies which utilized observation, participant observations and interviews as their primary research methodology are assigned in order to develop a critical understanding of the social marginalization and cultural aspects of the lives of real human beings living on the constant edge of the law. Cross-listed with CRJU 5270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7280 - Leadership in the Modern Criminal Justice System

The course is designed to enhance interest, experience and knowledge in leadership that promotes professionalism and ethical behavior. Individual and organizational dynamics are explored through a critical perspective, focusing on criminal justice roles and responsibilities. The class teaches effective leadership skills in areas such as team building, strategic planning, and decision making. Cross-listed with CRJU 5280. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7301 - Crime and Media

This course surveys the relationship between mass media and the U.S. criminal justice system. Special attention is given to the role of media in the social construction of reality. Emphasis is placed on the application of social constructionism to criminal justice related social problems. Cross-listed with CRJU 5301. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7320 - Seminar: Police Administration

Considers the major issues confronting police executives, such as professionalism, recruitment, selection, training, deployment, innovation, evaluation, and charges of brutality, in efficiency and corruption. Cross-listed with CRJU 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7325 - Qualitative Methods for Criminal Justice

Focuses on qualitative methods applicable to research in the field of criminal justice. The primary focus is on ethnographic approaches employing such fieldwork techniques as observation, participant observation, interviews, content analysis, life histories and case studies. Cross-listed with CRJU 5325. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7330 - Gangs and Criminal Organizations

This course examines extent, nature and trends of gangs and criminal organizations. We focus on contemporary studies and theories of gang behavior and organized crime. The course examines types of crime, gender and race issues, transnational violence, and public policies regarding criminal organizations. Cross-listed with CRJU 5330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7391 - Sex Offenders and Offenses

This course will focus on challenges practitioners face in the management of sex offenders. It covers development of programs and partnerships that can effectively assess, inform, manage and treat sex offenders through all phases of the system and reduce recidivism. Cross-listed with CRJU 5391. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7410 - Victimology

This course examines victim-offender relationships, the interactions between victims and the criminal justice system

and the connections between victims and other social groups and institutions among various populations. This course addresses the theory, history, research, legislation and policy implications related to the social construction of "the victim." Cross-listed with CRJU 5410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7420 - Violence in Society

This course examines various aspects of violence including distribution over time and space, situations and circumstances associated with violent victimization and offending, and how social institutions, community structure and cultural factors shape violent events. Cross-listed with CRJU 5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7430 - Drugs, Alcohol and Crime

This course provides an interdisciplinary overview of theory, research and policy issues surrounding the relationship between drugs, alcohol and crime; and the criminal justice system response. The course explores the socially constructed nature of illegal substances and connections to U.S. drug policy. Cross-listed with CRJU 5430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7510 - Seminar: Contemporary Issues in Law Enforcement

Examines current thinking and experience with respect to changing and reforming police programs and practices. The course focuses primarily on the American police experience, reviewing major innovations, exploring their rationale, and examining organizational impediments to their implementation. Cross-listed with CRJU 5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7520 - Seminar: Corrections

Provides a critical examination of the development and implementation of correctional systems in America. The course presents the origins of correctional efforts and the evolution of the prison; reviews punishment and rehabilitation rationales in the context of sentencing models; examines the social organization of the prison, including inmate subcultures and staff work strategies; and assesses the inmates' rights movement and the impact of judicial intervention in correctional settings. Cross-listed with CRJU 5520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7530 - Seminar: Community Corrections

Analyzes the theories and practices of probation and parole, responses of paroling authorities to public pressures and court controls, and their implications for rehabilitation. Efforts to bridge institutional settings and community life, as well as the feasibility and effectiveness of treating individuals under sentence in the community, are reviewed. Cross-listed with CRJU 5530. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7540 - Seminar: Juvenile Justice Administration

Examines the policies and practices of agencies in processing youthful offenders through the juvenile court system, reviews trends in juvenile justice policy making, and assesses changes in response to juvenile crime by both the juvenile justice and criminal justice systems. Cross-listed with CRJU 5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7550 - Seminar: Criminal Justice Policy Analysis

Provides a survey of conceptual and design strategies in criminal justice policy analysis. The logic and rationale of these various strategies are contrasted, and their relative merits are critiqued. Selected policy issues in the criminal justice system are utilized to illustrate the application and interpretation of alternative strategies. Cross-listed with CRJU 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7551 - Courts, Law & Justice

Analyzes judicial organization, court administration, and criminal court judicial decision making practices within the context of the broader operation of the criminal justice system. Special attention is paid to the social organization of the courtroom, examining the special roles of judges, prosecutors and defense attorneys. Cross-listed with CRJU 5551. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7552 - Seminar: Criminal Justice Ethics

Offers a normative framework within which to explore ways to increase sensitivity to the demands of ethical behavior among criminal justice personnel. The application of a normative perspective enhances the possibility that moral problems are better understood, more carefully analyzed, and rendered more tractable. Applied ethics forces a reflection not just on ethics, but also on the nature and operation of the criminal justice system itself. Cross-listed with CRJU 5552. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7553 - Seminar: Women and Criminal Justice

Explores issues surrounding women as offenders, victims, and criminal justice professionals. Investigates explanations for the involvement of women in illegal activities. Analyzes the plight of battered women, rape victims, and other female victims. Examines the participation of women in law enforcement, judicial processes, corrections and lawmaking. Cross-listed with CRJU 5553. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7571 - Advanced Seminar: The Social Organization of Crime

Explores the relationship of neighborhood social disorganization to the dynamics of crime from a social ecology perspective. The course examines the underlying social causes of phenomena such as criminal victimization, violent and property crime, neighborhood fear, neighborhood deterioration and recidivism. The course examines social, structural, and ecological characteristics of neighborhoods and communities in affecting crime. Cross-listed with CRJU 5571. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7572 - Advanced Seminar: Race, Crime and Justice

Examines the role of race in criminal justice processing. This course examines the research findings, interpretations, issues, and implications in assessing the impact of race in the administration of criminal justice. Explores the policy implications concerning the nature and extent of racial disparities in the criminal justice system and lays out a research agenda to more strategically address these issues within criminal justice policy making. Cross-listed with CRJU 5572. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7574 - Advanced Seminar: White Collar Crime

Employs both the social science and legal approaches to examine crime committed by corporations as well as by individuals in white collar occupations. The course covers how such crimes are socially defined, who commits them, who is victimized by them, which social contexts promote them, and how society and the criminal justice system respond to them. Cross-listed with CRJU 5574. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7575 - Advanced Seminar: The Mentally Disordered Offender

Examines the offender who may be mentally disordered. A survey is made of the various phases of the criminal justice system where psychiatrists are involved, e.g., diversion, fitness, insanity and sentencing. Dangerous sex offender legislation, "not guilty by reason of insanity" and "guilty but mentally ill" statutes, and issues concerning confidentiality, informed consent, and treatment are addressed. Cross-listed with CRJU 5575. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7576 - Advanced Seminar: Social Science in the Criminal Justice System

Examines the use of social science as a tool for legal analysis within the criminal justice system. The course examines how social science research is used to resolve relatively simple factual disputes, then moves on to more complex issues that arise when social science is invoked to make or to change law, both constitutional law (particularly the First, Sixth, Eighth and Fourteenth Amendments) and common law, particularly the construction of procedural rules that govern the operations of the criminal justice system. Cross-listed with CRJU 5576. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7600 - Special Topics in Criminal Justice

This highly specialized seminar addresses cutting-edge and emerging developments in the field of criminal justice and provides students and faculty with the opportunity to explore significant themes, issues, and problems from a broad interdisciplinary perspective. Topics vary from semester to semester. Course may be taken for credit more than once, provided subject matter is not repeated. Cross-listed with CRJU 6600. Max hours: 7 Credits. **Semester Hours:** 3 to 3

CRJU 7910 - Women and Violence: a Sociological Perspective

This course is a sociological, feminist analysis of violence against women and girls that addresses the intersection of sexism and other forms of oppression such as racism, classism and heterosexism within historical, cultural, social and institutional contexts. Topics covered focus on overt and covert forms of sexual coercion, harassment and assault, battering and stalking. Cross-listed with CRJU 5910 and PUAD 5910 . Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7920 - Psychology of Violence Against Women

This class addresses the contributions and the limitations of current empirical and clinical psychological literatures about domestic violence. Topics covered include: distinguishing among mental health professionals regarding work with DV clients; the psychological impacts of domestic violence; services useful for responding to the needs of women and children; and an introduction to the psychology and treatment of batterers. Cross-listed with CRJU 5920 and PUAD 5920. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7930 - Battered Women and the Legal System

This course provides a practical understanding of how the following relate to battered women and their children; a) major developments in federal, state, tribal, administrative, statutory and case law; b) the role and responses of the law enforcement, judges, attorneys, victim assistance providers and other legal system agents; and c) the role and process of victim advocacy. Cross-listed with CRJU 5930 and PUAD 5930. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 7940 - Interpersonal Violence, Advocacy, and Social Change

Students will gain an understanding of different models of social change and the various approaches to public address, including social movements and campaigns, that accomplish change. Strategies for engaging diverse individuals, systems and communities to address interpersonal violence will be examined at individual to societal levels. Cross-listed with CRJU 5940 and PUAD 5940. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CRJU 8840 - Independent Study

Affords the student the opportunity to pursue creative research activities under the individual supervision of a full-time faculty member. No more than six semester hours of credit for independent study may be applied toward the PhD degree. Prereq: 12 semester hours of criminal justice course work and permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 3

CRJU 8990 - Doctoral Dissertation

Upon admittance to candidacy, students must be continuously registered for dissertation credit each fall and spring semester or be automatically dropped from the program. Students must register for 7.0 credit hours per semester. In cases where students will not be using any university resources during a particular semester, they may petition the PhD director to register for only 3.0 credit hours to maintain continuous enrollment. Students must be registered for dissertation credit during the semester they have a colloquium or defense. Max hours: 10 Credits. **Semester Hours:** 1 to 10

CSCI 1001 - Computer Forensics I

Topics covered: how to conduct a computer forensic exam; how an individual can hide data on a computer; how the investigator can find that hidden data. This course will also incorporate hands-on learning through the use of a forensic software package. (Non-CS majors) Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 1350 - Introduction to Computing in Society

This is an introductory course for individuals who would like to learn about the field of computer science, how modern computing is affecting society, and the basics of computer programming. We will explore how computing has changed society, how intertwined in our daily lives computer programs have become, and how these programs are created. We will explore these topics while learning the basics of computer programming with the Java programming language. Prereq: High School Algebra. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 1410 - Fundamentals of Computing

First course in computing for those who will take additional computer science courses. Covers the capabilities of a computer, the elements of the computer language C++, and basic techniques for solving problems using a computer. Coreq: CSCI 1411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 1411 - Fundamentals of Computing Laboratory

This laboratory is taken with CSCI 1410 and will provide students with additional help with problem solving and computer exercises to compliment the course material covered in CSCI 1410. Coreq: CSCI 1410. Max hours: 1 Credit. **Semester Hours:** 1 to 1

CSCI 1510 - Logic Design

The design and analysis of combinational and sequential logic circuits. Topics include binary and hexadecimal number systems, Boolean algebra and Boolean function minimization, and algorithmic state machines. Lecture/lab includes experiments with computer-aided design tools. This course requires the level of mathematical maturity of students ready for Calculus I. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 1800 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

CSCI 2002 - Computer Forensics II

This is a continuation of CSCI 1001 This course will cover: computer forensics for advanced operating systems (Mac, Linux, and Unix) and mobile device forensics. This course will incorporate hands-on-learning by utilizing a computer forensics software package. (Non CS majors) Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2132 - Circuits and Electronics

This course is designed to serve as the basic course in CSE curriculum for second year bachelor students. It introduces the fundamentals of the analog and digit circuit abstraction and applications. Topics include: resistive elements, networks, sources, switches, MOS transistors, digital abstraction, amplifiers, energy storage elements. A web-based laboratory will allow students to have hands-on experiments. Prereq: MATH 2411, PHYS 2331, and CSCI 1510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2312 - Intermediate Programming

Programming topics in the C++ language. The emphasis is on problem solving using object oriented and Generic Programming. Topics include advanced I/O, classes, inheritance, polymorphism and virtual functions, abstract base classes, exception handling, templates, and the Standard Template Library. Prereq: ENGL 1020, CSCI 1410 and CSCI 1411 with a grade of C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2421 - Data Structures and Program Design

Topics include a first look at an algorithm, data structures, abstract data types, and basic techniques such as sorting, searching, and recursion. Programming exercises are assigned through the semester. Prereq: CSCI 1410 and 1411. Coreq: CSCI 2312. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2511 - Discrete Structures

Covers the fundamentals of discrete mathematics, including: logic, sets, functions, asymptotics, mathematical reasoning, induction, combinatorics, discrete probability, relations and graphs. Emphasis on how discrete mathematics applies to computer science in general and algorithm analysis in particular. Prereq: MATH 1401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2525 - Assembly Language and Computer Organization

Topics include computer architecture, program execution at the hardware level, programming in assembly language, the assembly process, hardware support of some high-level language features, and a program's interface to the operating system. Programming exercises are assigned in this course. These exercises involve the use of specific hardware in designated laboratories. Prereq: CSCI 1410 and 1510 and 1411 with a C- or better. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2571 - Fundamentals of UNIX

Introduces the UNIX operating system and its family of related utility programs. History and overview, versions, and common features. File operations, utilities, shells, editors, filters and data manipulation. Shell programming communications and networking, windowing environments, mail and Internet. Programming tools. Simple system administration. Credit will not count toward BSCSE degree. Prereq: Familiarity with operating systems and/or a programming course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2800 - Special Topics

Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 2930 - Practical System Administration

Introduces students to essential system administration topics including, but not limited to, IT design and configuration methodologies, desktop support, building and configuring production level servers, network technologies and troubleshooting, security, virtualization, storage, and server operating systems. Prereq: CSCI 1410 or an equivalent introductory computer programming course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3287 - Database System Concepts

Introduces database design, database management systems, and the SQL standard database language. Includes data

modeling techniques, conceptual database design, theory of object-relational and relational databases, relational algebra, relational calculus, normalization and database integrity. Prereq: CSCI 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3320 - Advanced Programming

The course will cover a wide range of advanced programming topics via focusing on development of cross-platform applications. The focus will be on problem solving and developing applications with modern languages (such as C++, Java, Objective-C) & frameworks, including Xcode, Angularjs (with Javascript, HTML5, CSS), Phonegap, & Webstorm. Prereq: CSCI 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3412 - Algorithms

Design and analysis of algorithms. Asymptotic analysis as a means of evaluating algorithm efficiency. The application of induction and other mathematical techniques for proving the correctness of an algorithm. Data structures for simplifying algorithm design, such as hash tables, heaps and search trees. Elementary graph algorithms. Assignments include written work and programming projects. Prereq: CSCI 2421 and CSCI 2511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3415 - Principles of Programming Languages

Introduces programming language design concepts and implementation issues. Includes language concepts such as control structures and data types, formal language specification techniques, and syntactic and semantic implementation issues. Prereq: CSCI 2421 and 2525. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3453 - Operating System Concepts

Covers the principles of computer operating systems and the essential components of an operating system. Topics include: I/O devices, file systems, CPU scheduling and memory management. Prereq: CSCI 3412 (Algorithm). Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3508 - Introduction to Software Engineering

Introduces principles and practices of software engineering: software life-cycle models, requirements engineering, analysis and design tools, human factors risk management, program certification, project management and intellectual property rights. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3511 - Hardware-Software Interface

Hardware and software techniques needed to control and program device interfaces. Input and output devices, computer peripherals, device drivers and interfaces are introduced. Specific programmable devices are used in class projects. Prereq: CSCI 2525. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3560 - Probability and Computing

Events and probability. Discrete random variables and expectation. Moments and deviations. Chernoff bounds. The probabilistic method. Markov chains and random walks. Continuous distributions and the Poisson process. Entropy, randomness and information. Randomized algorithms. Statistical inference. Prereq: MATH 2411 and CSCI 2511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3800 - Special Topics

Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3840 - Independent Study: CSCI

Max hours: 9 Credits. **Semester Hours:** 1 to 3

CSCI 3920 - Java Applications

This course introduces students to core Java, with a focus on design and implementation of GUI's using JFrames and event driven programming. Topics include Java Collections Framework, java.io package, and topdown design of solutions to engineering applications. Prereq: CSCI 3320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 3963 - Network Structures

This interdisciplinary course examines how the technological, social and economic worlds are connected and how the study of networks sheds light on these connections. Topics include: how opinions spread through society; the robustness and fragility of financial networks; the technology and economics of Web information and on-line communities. Prereq: MATH 2411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4034 - Theoretical Foundations of Computer Science

Introduces abstract models for computation, formal languages and machines. Topics include: automata theory, formal languages, grammars and Turing machines. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4110 - Applied Number Theory

Every year, Topics include divisibility, prime numbers, congruences, number theoretic functions, quadratic reciprocity, special diophantine equations, cryptography, computer security, and engineering applications. Prereq: Grade of C- or better in MATH 3000 or CSCI 2511. Cross-listed with CSCI 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4172 - Complexity and Problem Solving

Theoretical and practical aspects of solving complex problems, in particular, but not limited to, NP-complete and PSPACE-complete problems. Various heuristic and approximation algorithms, including greedy, ant, and Genetic

Algorithms will be studied. This course is by instructor's permission only. Prereq: CSCI 4034 or 5446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4173 - Computational Complexity and Problem Solving

Solid, in-depth theoretical foundation in computing, computational complexity, and algorithmics. Additional topics include various algorithms for both discrete and non-discrete problem domains. Models of Computation, Computational Complexity, Time Complexity Classes, Space Complexity Classes, The Theory of NP-completeness. Prereq: CSCI 4034. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4202 - Introduction to Artificial Intelligence

Topics include heuristic search, games playing algorithms, application of predicate calculus to AI, introduction to planning, application of formal grammars to AI. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4211 - Mobile Computing and Programming

This course contains two main simultaneous tracks, namely mobile computing and mobile programming. A series of lectures on various aspects of mobile computing provides an understanding of challenges and solutions in design and implementing mobile systems. The main topics include mobile sensing, human mobility and its technical implication. Prereq: CSCI 3453. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4287 - Embedded Systems Programming

Embedded Systems Programming happens across a spectrum of Domains. Embedded Systems Programming in the Small is characterized by the creation of small applications in high volumes. Embedded Systems Programming in the Large is characterized by the creation of medium to large applications in one-off or low volumes using specialized Operating Systems such as Real-time Operating Systems. Students will current languages, and are expected to have basic Operating Systems understanding. Prereq: CSCI 3453 Operating Systems Concepts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4408 - Applied Graph Theory

Introduces discrete structures applications of graph theory to computer science, engineering and operations research. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits. Matching and covering problems, shortest route and network flows. Prereq: MATH 3000 or CSCI 2511. Cross-listed with MATH 4408. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4411 - Computational Geometry

Many practical and aesthetic algorithmic problems have their roots in geometry. Applications abound in the areas of computer graphics, robotics, computer-aided design, and geographic information systems, for example. A selection of topics from convex hull, art gallery problems, ray tracing, point location, motion planning, segment intersection, Voronoi diagrams, visibility and algorithmic folding will be covered. Prereq: CSCI 3412. Cross-listed with CSCI 5411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4501 - Java

Comprehensive course on Java programming. Coverage of programming language constructs of Java and the core libraries that come with Java: coverage of advanced topics, including technologies for building distributed applications, and interacting with a database. Prereq: CSCI 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4555 - Compiler Design

Introduces the basic techniques used in translating programming languages: scanning, parsing, symbol table management, code generation, code optimization and error recovery. Prereq: CSCI 3412 and 3415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4565 - Introduction to Computer Graphics

Introduces two and three dimensional computer graphics. Topics include scan conversion, geometric primitives, transformation, viewing, basic rendering, and illumination. Emphasis is on programming using "C" and "C++" Open GL. Prereq: CSCI 3412 and MATH 3191 or 3195. Cross-listed with CSCI 5565. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4591 - Computer Architecture

Deals with how assembly language maps to hardware, and basic hardware techniques implemented in computers. Topics include logic design of arithmetic units, data control path processor logic, pipelining, memory systems, and input-output units. The emphasis is on logic structure rather than electronic circuitry. Students must know basic control logic design and be familiar with an assembly language before taking this course. Prereq: CSCI 2525. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4630 - Linguistic Geometry

Linguistic Geometry (LG) is a type of Game Theory in Artificial Intelligence, which permits to overcome combinatorial explosion and generate optimal strategies in real time. LG is currently changing the paradigm of military command and control in the USA and abroad. Prereq: CSCI 3412 or permission of instructor. Cross-listed with CSCI 5619. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4640 - Universal Compiler: Theory and Construction

Theoretical foundations and step-by-step hands-on experience in the development of a compiler, which can tune itself to a new programming language. This is a must-take course for future software developers as well as those interested in applications of the theory of Computer Science. Cross-listed with CSCI 5640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4650 - Numerical Analysis I

Methods and analysis of techniques used to resolve continuous mathematical problems on the computer. Solution of linear and nonlinear equations, interpolation and integration. Prereq: MATH 2411, MATH 3191 or MATH 3195, and programming experience. Cross-listed with CSCI 5660, MATH 4650, and MATH 5660. Max hours: 3 Credits.
Semester Hours: 3 to 3

CSCI 4660 - Numerical Analysis II

Numerical differentiation and integration, numerical solution of ordinary differential equations, and numerical solutions of partial differential equations as time allows. Prereq: MATH 3195 or both 3191 and 3200; MATH or CSCI 4650 or 5660; or programming experience. Cross-listed with CSCI 5661, MATH 4660 and 5661. Max hours: 3 Credits.
Semester Hours: 3 to 3

CSCI 4738 - Senior Design I

This is an advanced practical course in which students design, implement, and document and test software systems for use in industry, non-profits, government and research institutions. The course offers practical experience by working closely with project sponsors. It also offers extensive experience in oral and written communication throughout the software life cycle. Prereq: C- or better in CSCI 3287, CSCI 3415, CSCI 3453, and CSCI 3508. Max hours: 3 Credits.
Semester Hours: 3 to 3

CSCI 4739 - Senior Design II

This course is a continuation of Senior Design I. Students must have taken Senior Design I in order to enroll for Senior Design II. In this course, the projects begun in Senior Design I are completed and presented. Prereq: CSCI 4738. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4740 - Computer Security

Introduces basic knowledge from the computer security area. Concepts and techniques of cryptography, including history of codes and ciphers, basic cryptography techniques like data encryption standards, public key systems and digital signatures. Prereq: MATH 1120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4761 - Introduction to Computer Networks

Introduction and overview of computer networks. Topics include protocols, quality of services and performance issues. Prereq: CSCI 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4771 - Introduction to Mobile Computing

Provides an in-depth understanding of the fundamentals in mobile computing and studies the existing and proposed solutions for ubiquitous computing. This course focuses on systems and networking issues involved with supporting mobility. Prereq: CSCI 3453 and 4761. Cross-listed with CSCI 5771. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4788 - Bioinformatics

Provides a broad exposure to the basic concepts and methodologies of bioinformatics and their application to analyzing genomic and proteomic data. Topics may include dynamic programming algorithms, graph theoretic techniques, hidden Markov models, phylogenetic trees, RNA/protein structure prediction and microarray analysis. Prereq: CSCI 1410 and MATH 3195 or 3191. Cross-listed with MATH 4788, PHYS 4788. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4800 - Special Topics

Credit and subject matter to be arranged. Prereq: As determined by instructor. Max hours: 9 Credits. **Semester Hours:** 3 to 3

CSCI 4840 - Independent Study

For seniors majoring in computer science. Max hours: 9 Credits. **Semester Hours:** 3 to 3

CSCI 4910 - User Experience Design

A how-to course for any technologist who has endured difficult interfaces and wants to design effective user interfaces that respect and advance the user experience. Course includes: Psychology, HCI personas, scenarios, prototyping, and evaluation for desktop and mobile applications. Prereq: CSCI 2312 - Intermediate Programming. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4920 - Computer Game Design and Programming

Computer Game Design and Programming introduces practical and example driven approaches to modern 3D game development. Topics include 3D modeling, character animation, UI design, scripting, texture mapping, and sound effect. Prereq: CSCI 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 4939 - Internship

Faculty or employer-supervised employment in industry. Enrollment is limited to students who fully completed a contract for cooperative education credit by the last day of the drop or add period. Prereq: CSCI 3415. Max hours: 9 Credits. **Semester Hours:** 1 to 3

CSCI 5010 - Software Architecture

Software Engineers begin with System Descriptions, Requirements, and Constraints and must transform these into Software Architectures, Constraints, and Requirements. This course looks at Chronic Software Production Problems and how they might be addressed using Architectural Techniques to create Software Architectures from System Descriptions. Prereq: BS in Computer Science or equivalent experience or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5011 - Software Project Management Support

Large Software Systems must be Planned, Scheduled, and Staffed. To accomplish these tasks Software Engineers must understand the Software Architecture, the Software System Dependencies, Effort Estimation and the various Project Development Models that might be used. This course will look at different Project Models, Project Management Needs, and various Effort Estimation tools and techniques. Prereq: CSCI 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5012 - Data Systems

Persistent Data exists in almost every Software System. Data Systems can be categorized as Enterprise Data Systems or Application Data Systems. Software System Architectures and desired Software System Quality Attributes can be greatly impacted by poor choices in the integration and use of Persistent Data. This course will look at Software System Architectures for incorporating Persistent Data and will examine Program Construction Techniques and Coding Techniques for access to that Data. Prereq: CSCI 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5098 - Computer Science for Bioscientists

Provides a broad but detailed overview of the computer science field to graduate students in the biosciences, with emphasis on web technologies, programming languages, algorithms and database systems. No credit for CS graduate students. Prereq: Working knowledge of programming language (e.g., Java). Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5110 - Applied Number Theory

Every year, Topics include divisibility, prime numbers, congruences, number theoretic functions, quadratic reciprocity, special diophantine equations, cryptography, computer security, and engineering applications. Cross-listed with CSCI 4110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5172 - Complexity and Problem Solving

Theoretical and practical aspects of solving complex problems, in particular, but not limited to, NP-complete and PSPACE-complete problems. Various heuristic and approximation algorithms, including greedy, ant, and Genetic Algorithms will be studied. This course is by instructor's permission only. Prereq: CSCI 4034 or 5446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5211 - Mobile Computing and Programming

This course contains two main simultaneous tracks, namely mobile computing and mobile programming. A series of lectures on various aspects of mobile computing provides an understanding of challenges and solutions in design and implementing mobile systems. The main topics include mobile sensing, human mobility and its technical implication. Prereq: CSCI 3453 and CSCI 4761. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5217 - Information Theory

Introduces information theory and its application in computer science, communication theory, coding and applied mathematics. Entropy, mutual information, data compression and storage, channel capacity, rate distortion, hypothesis testing. Error detecting and correcting codes, block codes and sequential codes. Prereq: CSCI 4535. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5255 - Object Oriented Design

Software system design using object-oriented techniques, responsibility driven design and agile development practices. Topics include objects, classes, interfaces, inheritance, polymorphism, exception handling and testing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5408 - Applied Graph Theory

Introduces discrete structures applications of graph theory to computer science, engineering and operations research. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits. Matching and covering problems, shortest route and network flows. Prereq: MATH 3000 or CSCI 2511. Cross-listed with MATH 4408. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5409 - Graph Theory and Graph Algorithms

Studies geometric graphs and other geometric objects, both analysis and algorithmic construction, leads to interesting connections among VLSI design, graph theory and graph algorithms. Studies a subset of the recent literature, with special emphasis on visibility graphs, thickness of graphs, graph coloring and the surprising and elegant connections among them all. Other topics are introduced as time permits. Prereq: CSCI 3412, CSCI 4408, CSCI 5451 or MATH 4408 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5411 - Computational Geometry

Many practical and aesthetic algorithmic problems have their roots in geometry. Applications abound in the areas of computer graphics, robotics, computer-aided design, and geographic information systems, for example. A selection of topics from convex hull, art gallery problems, ray tracing, point location, motion planning, segment intersection, Voronoi diagrams, visibility and algorithmic folding will be covered. Prereq: CSCI 3412. Cross-listed with CSCI 4411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5446 - Theory of Automata

Studies the relationships between classes of formal languages (regular, context-free, context-sensitive, phrase-structure) and classes of automata (finite-state, pushdown, Turing machines). Additional topics include decidability and computability issues. Prereq: CSCI 3412. Cross-listed with MATH 5446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5451 - Algorithms

Advanced design and analysis techniques: dynamic programming, greedy algorithms, amortized analysis. Advanced

data structures: Fibonacci heaps, union-find data structures. Study of variety of special topics, which may include: graph algorithms, optimization problems, Fast Fourier Transform, string matching, geometric algorithms, NP-completeness and approximation algorithms. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5542 - Neural Networks

Parallel distributed representations, dynamics of Hopfield-style networks, content addressable memories, and Hebbian learning are the major topics of the first half. The last half consists of simulated annealing back propagation, competitive learning, and self-organizing networks. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5551 - Parallel and Distributed Systems

Examines a range of topics involving parallel and distributed systems to improve computational performance. Topics include parallel and distributed programming languages, architectures, networks, algorithms and applications. Prereq: Graduate standing. Cross-listed with CSCI 7551. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5552 - Advanced Topics in Parallel Processing

Examines the advances of sequential computers for gaining speed and application of these techniques to high-speed supercomputers of today. Programming methodologies of distributed and shared memory multiprocessors, vector processors and systolic arrays are compared. Performance analysis methods for architectures and programs are described. Prereq: CSCI 5551. Cross-listed with CSCI 7552. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5559 - Database Systems

Introduces database system concepts, with examination of relational database systems from conceptual design through relational schema design and physical implementation. Topics include database design and implementation for large database systems, transaction management, concurrency control, object-oriented and distributed database management systems. Prereq: CSCI 3287. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5565 - Introduction to Computer Graphics

Introduces two and three dimensional computer graphics. Topics include scan conversion, geometric primitives, transformation, viewing, basic rendering, and illumination. Emphasis is on the programming using C and C++ Open GL. Prereq: CSCI 3412 and MATH 3191/3195. Cross-listed with CSCI 4565. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5573 - Operating Systems

Students study the principles of computer operating systems and their essential components. Team projects expose students to a variety of system design issues as they relate to the functionality and performance of the system. Topics include I/O devices, Disk Scheduling, File System Organizations, Directory Systems, Sequential and Concurrent process, CPU Scheduling, Memory Management, Deadlock, Process and Threading, and review of some related articles in the literature. Prereq: Graduate Standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5574 - Advanced Topics in Operating Systems

Covers the advanced topics in operating systems by examining functionality and performance issues in CPU Scheduling, communications, distributed file systems, distributed operating systems, shared-memory multiprocessors and real-time operating systems. In addition to studying papers, reviews and presentations, students carry out a semester long team project within the scope of one of the above topics. Prereq: CSCI 3453 or CSCI 5573. Cross-listed with CSCI 7574. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5582 - Artificial Intelligence

Approaches to design of systems for solving problems usually solved by humans, especially those related to intelligent decision making. Emphasis on various types of knowledge representation. Cross-listed with CSCI 7582. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5585 - Advanced Computer Graphics

An in-depth study of active research topics in computer graphics. Topics include advanced rendering, global illumination, scientific visualization, geometric modeling, simulation and animation. Emphasis is on readings from literature and on a term project. Prereq: CSCI 5565 or 4565. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5593 - Advanced Computer Architecture

Important concepts in the structural design of computer systems are covered. Topics include memory hierarchy, super pipelining and super scalar techniques, dynamic execution, vector computers and multiprocessors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5595 - Computer Animation

This course introduces the state of the art techniques for modern computer animation focused on a practical, example driven approach to learning the unique art of 3D animation. Topics include modeling, kinematics, rigging, textures, physically based dynamics, and rendering. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5610 - Computational Biology

Designed to introduce a broad range of computational problems in molecular biology. Solution techniques draw from several branches of mathematics: combinatorics, probability, optimization, and dynamical systems. No prior knowledge of biology is critical, but it would be at least helpful to have the equivalent of BIOL 5099. Prereq: CSCI 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5619 - Complex Intelligent Systems

Presents the cutting-edge results of research in AI: advanced topics in linguistic geometry. LG is an approach to construction of mathematical models for reasoning about large-scale multi-agent concurrent games. The purpose of LG

is to provide strategies to guide the participants of a game to reach their goals. Prereq: CSCI 4630. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5630 - Linguistic Geometry

Linguistic Geometry (LG) is a type of Game Theory in Artificial Intelligence, which permits to overcome combinatorial explosion and generate optimal strategies in real time. LG is currently changing the paradigm of military command and control in the USA and abroad. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5640 - Universal Compiler: Theory and Construction

Theoretical foundations and step-by-step hands-on experience in the development of a compiler, which can tune itself to a new programming language. This is a must-take course for future software developers as well as those interested in applications of the theory of Computer Science. Cross-listed with CSCI 4640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5654 - Algorithms for Communication Networks

Algorithmic and mathematical underpinnings of communication networks. A taxonomy of data-packet networks depending on modes of communication: fixed-interconnection networks, radio networks and multiple-access channel. Algorithms to implement packet routing and broadcasting. Prereq: CSCI 3412. Cross-listed with CSCI 7654. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5660 - Numerical Analysis I

Methods and analysis of techniques used to resolve continuous mathematical problems on the computer. Solution of linear and nonlinear equations, interpolation and integration. Prereq: MATH 2411, MATH 3191 or MATH 3195, and programming experience. Cross-listed with CSCI 4650, MATH 4650, and MATH 5660. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5661 - Numerical Analysis II

Numerical differentiation and integration, numerical solution of ordinary differential equations, and numerical solutions of partial differential equations as time allows. Prereq: MATH 3195 or both 3191 and 3200; MATH or CSCI 4650 or 5660; or programming experience. Cross-listed with CSCI 4660, MATH 4660 and 5661. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5667 - Introduction to Approximation Theory

Normed linear spaces, convexity, existence and uniqueness of best approximations. Tchebychev approximation by polynomials and other related families. Least squares approximation and splines. Prereq: MATH 4320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5682 - Expert Systems

Reviews and analyzes many expert systems documented in the literature, such as Mycin, Macsyma, and Xcon. Emphasis is given to the design of rule-based systems, the use of uncertain and incomplete information and system shells. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5690 - Knowledge Representation for Intelligent Systems

An in-depth study of different types of knowledge representation in artificial intelligence for the efficient control of complex real-world systems like autonomous robots, space vehicles, and military units. Major emphasis is on search algorithms and heuristics, logical representation with applications to planning, formal linguistic representation. At the conclusion, all the theories studied are combined in the form of introduction to the state-of-the-art linguistic geometrical representation of complex control systems. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5701 - High-Performance Communication Systems and Network Analysis

Protocols and architectures related to high performance communication systems as well as network performance analysis techniques are covered. Topics include Integrated Services Digital Networks (ISDN), Broadband ISDN, protocols such as ATM and SONET, and high performance network architectures such as optical networks. Analytical analysis of network performance includes queuing theory and stochastic processes. Prereq: CSCI 4761 or 5761. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5702 - Data Mining Concepts and Techniques

Introduces data mining concepts and techniques, including but not limited to data preprocessing, data warehousing, pattern mining, classification, prediction, cluster analysis, outlier detection, and online data analytics. Prereq: CSCI 3412 and MATH 3191/3195. Cross-listed with CSCI 7702. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5704 - Introduction to Distributed Systems

Studies design, implementation and management of distributed systems, including communication issues, security reliability, resource sharing, and remote execution. Prereq: CSCI 3453 and 4591. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5728 - Software Engineering

Groups of students plan, analyze and design large software projects. Prereq: CSCI 3412 and 3415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5765 - Computer Networks

An in-depth study of active research topics in computer networks. Topics include: Internet protocols, TCP/UDP, congestion and flow control, IP routings, mobile IP, P2P overlay networks, network security, performance, and other current research topics. Prereq: Graduate standing. Cross-listed with CSCI 7765. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5771 - Introduction to Mobile Computing

Provides the fundamentals of mobile computing. Studies existing and proposed solutions for ubiquitous computing. This course focuses on systems and networking issues involved with supporting mobility. Prereq: CSCI 3453 and 4761. Cross-listed with CSCI 4771. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5780 - Theory of Distributed Computing

Elements of the theory of distributed computing through fundamental algorithmic ideas, lower bound techniques, and impossibility results. Timing assumptions (asynchrony and synchrony), simulations between models (message passing and shared memory), failure types (crash and Byzantine). Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5799 - Cloud Computing

This course studies fundamental designs and key technologies in Cloud Computing by reading technical articles, and conducting a semester group project. Topics include cloud computing design and architectures, service models, virtualization, advanced computer networks, programming, often software, and security. Note: Operating System, Computer Networks, and programming experience are recommended for success in this course. Prereq: Graduate standing. Cross-listed with CSCI 7799. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5800 - Special Topics

These special topics courses cover recent developments in an aspect of computer science. Prereq: As determined by instructor. Max hours: 9 Credits. **Semester Hours:** 3 to 3

CSCI 5840 - Independent Study

For graduate computer science students. Max hours: 8 Credits. **Semester Hours:** 1 to 3

CSCI 5866 - Advanced Mobile and Ubiquitous Systems

This course covers various aspects of mobile and ubiquitous systems to provide an in-depth understanding of principles, state-of-the-art solutions and challenges in design and implementation of such systems. Prereq: CSCI 3453 and CSCI 4761. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5920 - Computer Game Design and Programming

Computer Game Design and Programming introduces practical and example driven approaches to modern 3D game development. Topics include 3D modeling, character animation, UI design, level design, scripting, texture mapping, and sound effect. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 5941 - Directed Study: Programming Project

Software development project supervised by a faculty member approved by the Center for Computational Biology. Used towards a certificate in Computational Biology. Counts as an independent study. Prereq: CSCI 5451 and CSCI 5610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6010 - Principles of Programming

This course introduces students to fundamental principles and techniques in the design and implementation of modern programming such as C++, Java. Students learn how to write programs in an object oriented high level programming language. Weekly laboratory assignments will provide hands-on experience in this course. (non-CS majors) Prereq: meet MAPS requirements and familiarity with computer use. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6020 - Data Structures and Algorithms

This course introduces students to fundamental skills in computer science such as data structures and computer algorithms. Students will learn how to design efficient algorithms and analyze them. (non-CS majors) Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6030 - Computer Systems & Application

This course surveys essential technologies such operating systems, database systems, and the Internet. Students study the basic of operating systems, database systems, and the Internet. Weekly laboratory experiments will provide hands-on experience. (non-CS majors) Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6040 - Teaching Practice of Computer Science

This course provides students the opportunity for practicing and developing courses for adolescents using previously acquired knowledge. Students will design and develop a computer science class of their interest and appropriate to their area of expertise which they will offer at their school. (non-CS majors) Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6595 - Computational Methods in Nonlinear Programming

Introduces fundamental algorithms and theory for nonlinear optimization problems. Topics include Newton, quasi-Newton and conjugate directional methods; line search and trust-region methods; active set, penalty and barrier methods for constrained optimization; convergence analysis and duality theory. Prereq: MATH 4320, MATH 5718. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6664 - Numerical Linear Algebra

Offered every other year. Solution of linear equations, eigenvector and eigenvalue calculation, matrix error analysis, orthogonal transformation, iterative methods. Prereq: MATH 5660 and 5718. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6950 - Master's Thesis

Max hours: 12 Credits. **Semester Hours:** 1 to 9

CSCI 6960 - Master's Report

Students seeking a Master of Science in computer science, who do not choose to do a thesis, must complete an individual project of an investigative and creative nature under supervision of a full-time CS graduate faculty. Student must present their results to a faculty committee. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 6970 - MS Research Report

This course is for students who select the Plan III (Course Only) option to complete their MS degree requirements. Graduating students must register for this course their final semester and submit a final written research paper on a subject specified by a CSE faculty committee. **Semester Hours:** 0 to 0

CSCI 7002 - Computer Security

A broad overview of computer security, roughly divided into three unequal components: a) the history of codes and ciphers; b) basic cryptographic techniques, for example, symmetric cryptography, authentication techniques, and asymmetric crypto systems, and; c) applications to current and future computer-related technologies, for example, network security, wireless communication, quantum cryptography, and more. Prereq: CSCI 5451. Cross-listed with ISMG 7002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7173 - Computational Complexity and Algorithms

A solid, in-depth theoretical foundations in computing, computational complexity, and algorithmics. Various algorithms, including both discrete and non-discrete problem domains. NP-complete and other complete classes of problems/languages. Prereq: CSCI 5446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7200 - Advances in Management Information Systems

Provides a broad coverage of research on the management of information technology. The course covers the systems-oriented research, organizational-oriented research, and information systems economics research. Prereq: PhD standing. Cross-listed with ISMG 7200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7210 - Topics in Analytical Research in Management Information Systems

Covers a variety of analytical research topics of interest to the IS research community including the evaluation of data mining algorithm performance, cost sensitive learning and outlier detection. Prereq: Admission to the CSIS PhD program. Cross-listed with ISMG 7210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7211 - Topics in Behavioral-Organizational Research in Management Information Systems

Provides in-depth exposure to some key behavioral, management and organizational theories and models used in Information Systems research. Covers topics in socio-technical, trust, computer self-efficacy, organizational transformation, organizational learning, resource-based and coordination theories. Prereq: Admission to the CSIS PhD program. Cross-listed with ISMG 7211. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7502 - Research Methods

Promotes research skills. Involves presenting a research topic and discussions of its merits, reviewing journal articles, writing a paper and/or a proposal in the NIH/NSF format in the student's area of research. Prereq: PhD student standing or permission of instructor for MS students who are writing a thesis. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7551 - Parallel and Distributed Systems

Examines a range of topics involving parallel and distributed systems to improve computational performance. Topics include parallel and distributed programming languages, architectures, networks, algorithms and applications. Prereq: Graduate standing. Cross-listed with CSCI 5551. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7552 - Advanced Topics in Parallel Processing

Examines the advances of sequential computers for gaining speed and application of these techniques to high-speed supercomputers of today. Programming methodologies of distributed and shared memory multiprocessors, vector processors and systolic arrays are compared. Performance analysis methods for architectures and programs are described. Cross-listed with CSCI 5552. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7574 - Advanced Topics in Operating Systems

Covers the advanced topics in operating systems by examining functionality and performance issues in CPU Scheduling, communications, distributed file systems, distributed operating systems, shared-memory multiprocessors and real-time operating systems. In addition to studying papers, reviews and presentations, students carry out a semester long team project within the scope of one of the above topics. Prereq: CSCI 3453 or CSCI 5573. Cross-listed with CSCI 5574. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7582 - Artificial Intelligence

Approaches to design of systems for solving problems usually solved by humans, especially those related to intelligent decision making. Emphasis on various types of knowledge representation. Cross-listed with CSCI 5582. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7595 - Computer Animation

This course introduces the state of the art techniques for modern computer animation focused on a practical, example driven approach to learning the unique art of 3D animation. Topics include modeling, kinematics, rigging, textures, physically based dynamics, and rendering. Prereq: CSCI 3412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7654 - Algorithms for Communication Networks

Algorithmic and mathematical underpinnings of communication networks. A taxonomy of data-packet networks depending on modes of communication: fixed-interconnection networks, radio networks and multiple-access channel. Algorithms to implement packet routing and broadcasting. Prereq: Permission of instructor. Cross-listed with CSCI 5654. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7702 - Data Mining Concepts and Techniques

Introduces data mining concepts and techniques, including but not limited to data preprocessing, data warehousing, pattern mining, classification, prediction, cluster analysis, outlier detection, and online data analytics. Cross-listed with CSCI 5702. **Semester Hours:** 3 to 3

CSCI 7711 - Bioinformatics I

(BIOL 7711-Offered on a semester basis from H.S.C.) What is Bioinformatics and why study it? How is large-scale molecular biology data generated, where and how can researchers gain access to it, what computational analyses are possible and computational techniques for solving inference problems in molecular biology? Prereq: Permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CSCI 7712 - Bioinformatics II

(BIOL 7712-offered on a semester basis from H.S.C.) Inference problems and computational techniques for molecular biology, with emphasis on machine learning approaches. Use of computational induction techniques focused on information extraction from biomedical literature, inference of biochemical networks from high-throughput data and prediction of protein function. Estimation, clustering, discrimination and regression. Prereq: CSCI 7711. Max hours: 4 Credits. **Semester Hours:** 4 to 4

CSCI 7765 - Computer Networks

An in-depth study of active research topics in computer networks. Topics include: Internet protocols, TCP/UDP, congestion and flow control, IP routings, mobile IP, P2P overlay networks, network security, performance, and other current research topics. Prereq: Graduate standing. Cross-listed with CSCI 5765. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7799 - Cloud Computing

This course studies fundamental designs and key technologies in Cloud Computing by reading technical articles, and conducting a semester group project. Topics include cloud computing design and architectures, service models, virtualization, advanced computer networks, programming, often software, and security. Note: Operating System, Computer Networks, and programming experience are recommended for success in this course. Prereq: Graduate standing. Cross-listed with CSCI 5799. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7800 - Special Topics

These special topics courses cover recent developments in an aspect of computer science. Prereq: As determined by instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 7840 - Independent Study

Offers doctoral students opportunity for independent, creative work under supervision of a CSE full-time graduate faculty. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CSCI 7866 - Advanced Mobile and Ubiquitous Systems

This course covers various aspects of mobile and ubiquitous systems to provide an in-depth understanding of principles, state-of-the-art solutions and challenges in design and implementation of such systems. Prereq: CSCI 3453 and CSCI 4761. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CSCI 8990 - Doctoral Dissertation

Max hours: 9 Credits. **Semester Hours:** 1 to 9

CVEN 1025 - Civil Engineering Graphics and Computer Aided Design

Introduces microcomputer-based, menu-driven, 2-D and 3-D computer-aided design systems; standard Civil Engineering industry details and some three-dimensional modeling of solid objects; principles on engineering drawing and descriptive geometry with applications specifically geared for civil engineers. Prereq: High School Geometry and Algebra. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 1800 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 6

CVEN 1840 - Independent Study

This category is intended for topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Departmental approval is required. Max hours: 9 Credits. **Semester Hours:** 1 to 6

CVEN 2121 - Analytical Mechanics I

A vector treatment of force systems and their resultants; equilibrium of trusses, beams, frames, and machines, including internal forces and three-dimensional configurations, static friction, properties of areas, distributed loads and hydrostatics. Prereq: PHYS 2311 and MATH 2411. Cross-listed with MECH 2023. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 2200 - Computing Methods in Civil Engineering

Introduces MATLAB computer programming for engineering applications. Students will learn programming concepts such as relational and logical operations, branching statements and loops. They will apply these concepts in the MATLAB platform to write programs to solve several engineering problems. Prereq: CVEN 1025 and MATH 2411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 2212 - Plane Surveying

Observation, analysis and presentations of basic linear, angular, area and volume field measurements common to civil engineering endeavors. Coreq: MATH 1401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 2800 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 6

CVEN 2840 - Independent Study

This category is intended for topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Departmental approval is required. Max hours: 9 Credits. **Semester Hours:** 1 to 6

CVEN 3111 - Analytical Mechanics II

A vector treatment of dynamics of particles and rigid bodies, including rectilinear translation, central-force, general motion of particles, kinematics of rigid bodies, the inertia tensor, plane motion of rigid bodies; energy and momentum methods for particles, systems of particles and rigid bodies. Prereq: CVEN 2121. Cross-listed with MECH 2033. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3121 - Mechanics of Materials

Mechanical properties of materials, stresses and strains in members subjected to tension, compression and shear, combined stresses, flexural and shearing stresses in beams, deflections of beams, column analysis, principal stresses. Prereq: CVEN 2121. Cross-listed with MECH 3043. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3141 - Introduction to Structural Materials

Introduces the production, properties, and behavior of common engineering materials. Emphasis is placed on concrete, steel, and wood. Includes the techniques used to determine material properties. Coreq: CVEN 3121. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CVEN 3212 - Plane Surveying For GIS Majors

This course will present the concepts and practical materials for surveying instruments, survey data collection methods and data processing with applications in GIS. It will cover the shape of the Earth theory, Map projections, Datum, 2D and 3D coordinate transformation methods and coordinate geometry problems. Prereq: MATH 1401 and 2411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3313 - Fluid Mechanics

Fundamentals of fluid mechanics. Topics include fluid properties, hydrostatics, the continuity principle, the energy principle, the momentum principle, similitude and dimensional analysis, drag, and friction for laminar and turbulent flow in closed conduits. Prereq: CVEN 2121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3323 - Hydrosystems Engineering

This course covers hydrologic cycle, rain gage and stream gage, basics of rainfall and runoff data analysis, Rational method for peak flow predictions, culvert hydraulics with consideration of inlet and outlet control, sanitary sewer sizing, basics of open channel hydraulics. This course also includes a session of hydraulic experiment to measure the turbulent flow distribution in a steel pipe. Prereq: CVEN 3313. Coreq: CVEN 2200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3401 - Introduction to Environmental Engineering

An introductory course that provides a unique systems approach to environmental engineering, examining the source-to-receptor feedback loop for pollution control. Physical, chemical and biological processes are integrated across atmospheric, wastewater and subsurface systems. Laboratory exercises provide direct experiential learning of key concepts. Prereq: CHEM 1130 or equivalent. Cross-listed with CVEN 5401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3414 - Water Supply and Distribution Systems

Planning and design for potable water supply and distribution. Topics include the civil engineering design process, pressurized pipe networks, pump selection, water demand estimation, surface- and groundwater resources, and reservoir operation. Design project and field trip required. Prereq: CVEN 3313. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3505 - Structural Analysis

Principles of structural analysis applied to statically determinate and indeterminate structures. Prereq: CVEN 3121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3602 - Transportation Engineering

This course will introduce you to the concepts and methods of transportation engineering, planning and management. This course will emphasize traffic engineering. Topics will include vehicle dynamics, traffic flow fundamentals, accident analysis, signal timing, highway capacity analysis, level of service analysis, freeway operations, and

evaluation procedures for alternative transportation projects. Prereq: Junior standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3718 - Geotechnical Engineering I

Soil formation, phase diagram, soil constituents and behavior, description of soils, classification, clay minerals, compaction, soil improvement, capillarity, shrinkage, swell, collapsible soil, frost action, flow through porous media, and consolidation. Lab experiments, including specific gravity, grain size analysis, liquid and plastic limits, and consolidation, are to be conducted in concert with the lectures. Prereq: CVEN 3121. Coreq: CVEN 3313. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 3800 - Special Topics: 3800

Max hours: 6 Credits. **Semester Hours:** 1 to 6

CVEN 3840 - Independent Study

This category is intended for topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Departmental approval is required. Max hours: 9 Credits. **Semester Hours:** 1 to 8

CVEN 4000 - Senior Seminar

Required for all Civil Engineering majors. Each student shall take the state-administered Fundamentals of Engineering (F.E.) examination. This course is taken the semester of or prior to graduation. This course will meet one time after the FE exam and prior to the graduation ceremony to review curriculum and examination results. This course is a pass/fail course and failure to attend the meeting of this course will cause a fail, and may delay graduation. Prereq: approved 30 credit hour check. Max hours: 0 Credits. **Semester Hours:** 0 to 0

CVEN 4025 - Advanced Civil Engineering Graphics

Course builds on CVEN 1025. Lectures target industry specific building information modeling software and elevating students knowledge of software to an in-depth understanding. Focusing on the areas of drafting designed systems, producing documentation, and project workflows. Requisite is CVEN 1025, students may skip requisite if they have previously taken a CAD course, at the college level. Approval is subject to Department Advisor approval. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4067 - Senior Design Projects

Senior civil engineering students, working in teams, are assigned significant open-ended design problems requiring the synthesis of material learned in previous engineering courses for solution. Design teams work independently under the supervision of a civil engineering faculty member. Prereq: Graduation Agreement and one design course. Co-req: A second design course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4077 - Engineering Economy

Applies economic and financial principles to evaluation of engineering alternatives. Calculation of annual costs, present worth and prospective rates of return on investment. Review of systems analysis techniques, including simulation, linear programming, and project scheduling. Prereq: Junior standing. Cross-listed with MECH 4147. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4087 - Engineering Contracts

Laws met by the practicing engineer, types of contracts, specification writing, laws on contracts, agency, partnership, sales and property, with primary emphasis on rights and duties of the engineer. Prereq: Senior standing. Cross-listed with CVEN 5087. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4230 - Construction Engineering Systems

Course provides an introduction to construction engineering management including building mechanical and electrical systems. Prereq: CVEN 2121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4232 - Construction Planning and Control

This course presents knowledge on planning and controlling of construction projects. Students will learn the basics of construction planning to develop work breakdown structure and activity list, estimate activity cost and duration, and identify job logic and precedence relationships. Several scheduling techniques will be presented in this class, including bar chart, network scheduling, uncertainty in scheduling (PERT), limited resources scheduling, resource leveling, line of balance, and time-cost tradeoff analysis. Furthermore, this class will provide knowledge on construction control techniques, including cash flow analysis, integrated time-cost control, and value engineering. Students will acquire skills on the use of currently available computer scheduling and planning software such as Primavera 6 and Navisworks Manage to create 4D models and visualize the sequence of the construction activities. In addition, students will form teams and work on a project throughout the semester to apply the skills that they learn in class. Prereq: jr. standing or higher. Cross-listed with CVEN 5232. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4235 - Construction Engineering

This course starts with a quick overview of Construction Engineering Management including organizations involved, current approaches and challenges and approaches. The course then covers contracts, quality management, risk management and decision analysis, financial management, safety, and temporary construction facilities. Prereq: jr. standing or higher. Cross-listed with CVEN 5235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4388 - Site Engineering

Course introduces the fundamentals of site engineering which require understanding and interpreting landforms, slopes, contour lines, grading, drainage, and earthwork to storm water management, hydrology reports, designing roadways, and street networks. Other topics include designing for ADA and concepts of sustainability in site design. Note: CAD experience is recommended. Cross-listed with CVEN 5388. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4427 - Storm Water System Design

This course covers urban watershed analysis, design rainfall and hydrologic losses, flood frequency and design event, rational method for peak runoff prediction, street hydraulic capacity and safety, culvert hydraulics, street inlet collection system, and storm sewer system design and flow analysis. Prereq: CVEN 3323 and senior standing. Cross-listed with CVEN 5427. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4537 - Numerical Methods for Engineers

Introduces numerical analysis. Solution of linear and non-linear equation systems. Numerical methods for ordinary and partial differential equations. Engineering applications. Prereq: CSCI 1410, MATH 3191 and 3200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4565 - Timber Structure Design

Design of wood roof, wall, and floor systems including beams, columns, trusses, diaphragms and shear walls for vertical and lateral loads. Connection design, glued-laminated members, plywood, and engineered lumber are incorporated. Prereq: CVEN 3505 and CVEN 3141. Cross-listed with CVEN 5565. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4575 - Structural Steel Design

Design of structural steel members and their connections. Prereq: CVEN 3505 and CVEN 3141. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4585 - Reinforced Concrete Design

Ultimate strength methods for design of reinforced concrete structures. Prereq: CVEN 3505 and CVEN 3141. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4602 - Highway Engineering

Evaluates alternate highway routes. Discusses highway drainage, finance, maintenance, pavement design, traffic operations and principles of economic analysis. Analyses of the impact of the highway on the environment. Prereq: CVEN 3602 and CVEN 3708/3718. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4719 - Design & Construction of Geosynthetic Soil Structures

Theory of reinforced soil; Mechanical and hydraulic properties of geosynthetics; Soil-geosynthetic interaction behavior; Design concepts of GRS structures; Design and construction of GRS retaining walls; Design and construction of GRS embankments and slopes; Design and Construction of GRS foundations. Prereq: CVEN 3718 and 4728. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4728 - Geotechnical Engineering II

Shear behavior and strength, and basic applications of shear strength (such as earth pressure and retaining structures, bearing capacity of footings, and slope stability). Lab experiments, including permeability, direct shear, unconfined compression, and triaxial tests, are to be conducted in concert with the lectures. Prereq: CVEN 3708/3718. Max hours: 2 Credits. **Semester Hours:** 2 to 2

CVEN 4738 - Intermediate Foundation Engineering

Applies principles of soil mechanics to the analysis and design of foundations and earth structure. Theories of consolidation, earth pressure, slope stability, and bearing capacity. Studies settlement of structures, shallow and deep foundations, retaining walls and excavations. Prereq: CVEN 3708/3718 and CVEN 3141. Coreq: CVEN 4718/4728. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4780 - Engineering Geology

Studies geology as utilized in engineering and environmental practice. Emphasizes a conceptual integration of geologic materials, processes, and rates of change as a basis for successful application of geologic knowledge to environmental planning and engineering design projects. Prereq: MATH 2411 and CVEN 2121. Cross-listed with CVEN 5780 and GEOL 4780, 5780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 4800 - Special Topics

Supervised study of special topics of interest to students under guidance of instructor. Prereq: Permission of instructor. Max hours: 9 Credits. **Semester Hours:** 3 to 3

CVEN 4840 - Independent Study

This category is intended for topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Departmental approval is required. Max hours: 9 Credits. **Semester Hours:** 1 to 6

CVEN 5087 - Engineering Contracts

Laws met by the practicing engineer, types of contracts, specification writing, laws on contracts, agency, partnership, sales and property, with primary emphasis on rights and duties of the engineer. Cross-listed with CVEN 4087. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5111 - Structural Dynamics

Vibration and dynamic response of simple linear and nonlinear structures to periodic and general disturbing forces. Frequency domain analysis, response analysis of multi-degree-of-freedom systems. Wind and earthquake effects. Prereq: CVEN 3505. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5112 - Structural Design Loads

The course will review the probabilistic approach for load determination used in modern building codes from theoretical and applied perspectives. The course is intended to study dead loads, live loads, snow loads, earthquake loads, wind loads, and load combinations for buildings; and selected topics on bridge loads. Other topics may be treated as time permits. Prereq: CVEN 3505 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5121 - Intermediate Mechanics of Materials

Intermediate-level course in the mechanics of deformable bodies. Plane stress and strain; stress-strain relation with emphasis on elastic and inelastic behavior of members, and theories of failure. Discussion of basic methods of structural mechanics, with applications to asymmetric and curved beams, thick walled pressure vessels, torsion of members of noncircular section, and other selected problems in stress analysis. Prereq: CVEN 3121, MATH 3191 and 3200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5201 - Construction Dewatering

Introduction to construction dewatering including removal of ground water and surface water in construction sites, characteristics of groundwater aquifers, groundwater flow, geotechnical investigation of dewatering problems and application of modern dewatering technology. Basic methods for controlling water on a construction project are presented incorporating open flow and pumping of excavations, soil pre-draining, water cutoff and exclusion. Prereq: Theoretical/applied fluid mechanics, Soil mechanics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5231 - Construction Materials and Methods

This course presents information regarding the primary materials and methods used to design and construct the majority of buildings in the United States including concrete, wood and steel. Students explore processes related to the specification, ordering and installation of various construction materials, as well as analyze various materials' performance characteristics. Two important themes are incorporated throughout discussions: sustainability and ethics. In addition to lectures and class activities, students will be asked to research, define, and present information regarding a wide range of material properties and construction processes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

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CVEN 5232 - Construction Planning and Control

This course presents knowledge on planning and controlling of construction projects. Students will learn the basics of construction planning to develop work breakdown structure and activity list, estimate activity cost and duration, and

identify job logic and precedence relationships. Several scheduling techniques will be presented in this class, including bar chart, network scheduling, uncertainty in scheduling (PERT), limited resources scheduling, resource leveling, line of balance, and time-cost tradeoff analysis. Furthermore, this class will provide knowledge on construction control techniques, including cash flow analysis, integrated time-cost control, and value engineering. Students will acquire skills on the use of currently available computer scheduling and planning software such as Primavera 6 and Navisworks Manage to create 4D models and visualize the sequence of the construction activities. In addition, students will form teams and work on a project throughout the semester to apply the skills that they learn in class. Cross-listed with CVEN 4232. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5233 - Construction Cost Estimating

This course presents the application of scientific principles to rough and detailed cost estimating; cost indexing; bidding document, process and contract documents; quantity take off; concepts and statistical measurements of the factors involved in direct costs; overhead costs, cost markups and profits; project financing and cashflow analysis; cost control; computerized estimating and building information modeling; life cycle cost; and value engineering. Students are expected to use RSMeans building construction cost data to develop a detailed cost estimate of a project during the semester. Max hours: 3 Credits. **Semester Hours:** 3 to 3

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CVEN 5234 - Sustainable Construction

This course will serve as an introduction to major components and technologies used in sustainable design and construction to create healthy, environmentally-sensitive built environments. Content focuses on construction processes, renewable energy systems, healthy buildings, natural and cultural resources, and traditional as well as cutting-edge building techniques. Course participants will gain knowledge about effective sustainable practices through active learning by engaging in case studies, class presentations, and group activities. Numerous guest speakers will share first-hand experience regarding implementation and professional practice of sustainable principles in the real-world. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5234 - Sustainable Construction

This course will serve as an introduction to major components and technologies used in sustainable design and construction to create healthy, environmentally-sensitive built environments. Content focuses on construction processes, renewable energy systems, healthy buildings, natural and cultural resources, and traditional as well as cutting-edge building techniques. Course participants will gain knowledge about effective sustainable practices through active learning by engaging in case studies, class presentations, and group activities. Numerous guest speakers will share first-hand experience regarding implementation and professional practice of sustainable principles in the real-world. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5235 - Advanced Construction Engineering

This course starts with a quick overview of Construction Engineering Management including organizations involved, current approaches and challenges and approaches. The course then covers contracts, quality management, risk management and decision analysis, financial management, safety, and temporary construction facilities. Cross-listed with CVEN 4235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5236 - Project Management Systems

Address the basic nature of managing projects and the advantages and disadvantages to this approach. Introduce the characteristics, techniques, and problems associated with initiating, planning, executing, controlling, and closeout of projects. Learn about the International Standards of PM and how to use them. Develop a management perspective about projects to help develop future project managers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5236 - Project Management Systems

Address the basic nature of managing projects and the advantages and disadvantages to this approach. Introduce the characteristics, techniques, and problems associated with initiating, planning, executing, controlling, and closeout of projects. Learn about the International Standards of PM and how to use them. Develop a management perspective about projects to help develop future project managers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5237 - Advanced Project Management

A survey of advanced topics in project management building on the Project Management Systems course and utilizing the Project Management of Knowledge. Case studies, complex problems, and a class project will be utilized in the course to bring a practical perspective to the conceptual lessons. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5237 - Advanced Project Management

A survey of advanced topics in project management building on the Project Management Systems course and utilizing the Project Management of Knowledge. Case studies, complex problems, and a class project will be utilized in the course to bring a practical perspective to the conceptual lessons. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5238 - Integrated Construction Leadership

The course is an integrated architecture, engineering, and construction (AEC) business course bringing together executives, principals, and managers to current industry topics to provide students an opportunity to apply management and leadership principles from the various fields to case study projects. Coreq: CVEN 5235, BANA 6650 and ARCH 6490. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5333 - Surface Water Hydrology

Fundamentals of hydrology emphasizing surface water processes. Topics include the hydrologic cycle, frequency

analysis, drought management, flood routing, rainfall-runoff relationships (rational method, unit hydrograph, and hydrologic software) and hydrologic design. Prereq: graduate standing in Engineering or instructor consent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5334 - Groundwater Hydrology

Topics include groundwater occurrence, hydrologic cycle and budget, interactions with surface waters, principles of groundwater flow, well hydraulics, well field design, regional flow systems, water and pollutant chemistry, computer modeling and groundwater management. Emphasis is on quantitative analysis methods for groundwater resource inventory, design and management. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5335 - Vadose Zone Hydrology

Engineering analysis of the vadose zone, the unsaturated porous media linking the earth surface to groundwater. Darcy's law for flow. Richards equation for moisture content. The advection-dispersion equation for solutes. Analytical solutions and numerical modeling applied to infiltration, evaporation, drainage, and subsurface remediation. Prereq: graduate standing in civil engineering or consent of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5336 - Urban Runoff Quality and Quantity Modeling

This course covers rainfall/runoff data base, rain gage under-catch, statistical models for frequency analysis, Unit Graph and Kinematic Wave method for runoff prediction, urban watershed modeling, event-based flood prediction, continuous flow predictions, modeling consistency and sensitivity, impact assessments, master drainage planning, and storm centering technique. Prereq: CVEN 3323 with a C- or higher and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5343 - Open Channel Hydraulics

Engineering analysis and design of natural and artificial open channels. Application of uniform flow concept to design of erodible and non-erodible channels. Application of energy and momentum principles to conditions of gradually varied flow, spatially varied flow and rapidly varied flow. Prereq: CVEN 3323 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5344 - Unsteady Open Channel Hydraulics

Derivation of basic principles of unsteady open channel flow. Application of kinematic wave, diffusive wave and dynamic wave approaches to open channel, including overland flow and flow in a drainage or river network. Introduction of numerical finite difference methods, characteristic method and simplified analytical method for the solution of unsteady open channel flow problems. Evaluation of computer simulation models such as DWOPER and SWMM. Prereq: CVEN 5343 and CVEN 5333 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5345 - Computational Methods for Water Resources

This course covers two major areas: hydrologic and hydraulic numerical routing schemes. The hydrologic routing includes linear and nonlinear reservoir operations using the characteristic curves derived from the reservoir geometry. The hydrologic routing numerical scheme will be applied to optimize the reservoir operations for power generation, irrigation, and flood control. The hydraulic routing covers Dynamic Flood Wave, Diffusive Wave, and Kinematic Wave. The finite difference method is used to develop numerical models to predict flood flows through channels. This course also covers probable maximum precipitation and dam break flow analysis. Prereq: CVEN 3323. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5381 - Introduction to Geographic Information Systems

Provides an overview exposure and experience with various aspects of GIS technology and its uses for natural resource and infrastructure, planning, design and management. This course involves a survey of GIS software and hardware, review of cartographic mapping principles, hands-on applications to environmental impact assessment, municipal facilities management, transportation, water resources and demographics. GIS project management factors are addressed. Prereq: Graduate and/or upper division standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5382 - GIS Spatial Database Development

This second GIS course builds on the introductory course and addresses principles and technologies for development and conversion of spatial databases, including photogrammetry, surveying and geodesy, coordinate systems and transformations, and remote sensing. Prereq: Graduate and/or upper division standing; completion of CVEN 5381 (or equivalent) and MEng-GIS program prerequisites (especially surveying, mapping and computing); background in algebra, calculus fundamentals and facility to compute DOS/UNIX, spreadsheet, and FORTRAN; familiarity with various CAD (e.g. AutoCAD) and GIS (e.g. ArcInfo, GRASS) software is also required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5383 - GIS Analysis -- Theory and Practice

This third course reviews GIS software functions and terminology, including data entry (input, editing), manipulation (projection, merge, window, aggregate), analysis (map algebra, overlay, Boolean, interpolation network, measurements, distance, terrain modeling, statistical analysis), query (spatial, attribute), and display/reporting. Integration of various domain-specific systems analysis models with GIS databases is also addressed. Laboratory activities involve programming applications using available GIS. Prereq: Graduate and/or upper division standing; completion of CVEN 5381 (or equivalent) and completion of MEng-GIS prerequisites (especially applied Statistics); background in algebra, calculus fundamentals, facility to compute DOS/UNIX, OS/UNIX, spreadsheet, and FORTRAN; familiarity with various CAD (e.g., AutoCAD) and GIS (e.g., ArcInfo, GRASS), software is also required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5384 - GIS Management and Policies

This fourth course addresses aspects of GIS planning and development. These include topics of benefit-cost and financial analysis, scheduling, project management, internal and external marketing. Also, addressed are issues of GIS institutional acceptance, the role of computerized spatial data systems in decision making, application of planning techniques for accomplishing resource goals, administrative structure which enhances efficiency of use, and legal considerations involved with development and use of such databases. Prereq: Graduate and/or upper division standing; completion of CVEN 5381 (or equivalent); familiarity with various CAD (e.g. AutoCAD) and GIS (e.g. ArcInfo, GRASS) software is also required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5385 - GIS Relational Database Systems

Introduces relational database management system concepts with emphasis on GIS. Includes examination of relational database systems from conceptual design through relational schema design and physical implementation. Topics include SQL, database design and implementation for large database systems, transaction management, concurrency control, distributed database management systems and the interaction and progressive integration of GIS technologies and RDBMS technologies. Prereq: Graduate and/or upper division standing; completion of CVEN 5381 or equivalent and completion of MEng-GIS program prerequisites. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5386 - GIS Laboratory

Provides in-depth experience with use and programming of a particular GIS software, including ArcGIS and related object-oriented programming languages. Advanced functionality for user authoring of software interface, data management and analysis functions and output generation. Exact content will vary by semester. Prereq: Computing and Introduction to GIS or their equivalent. Max hours: 18 Credits. **Semester Hours:** 3 to 3

CVEN 5387 - Advanced Remote Sensing

Addresses remote sensing concepts including 1) imaging sensors and geo-referencing; 2) image processing for radiometric, multi-spectral image enhancement, and multi-sensor image fusion; and 3) multi-spectral image classification, including feature extraction, supervised and unsupervised classification, and extensions to hyper-spectral data. Prereq: CVEN 5381 and graduate standing or permission from instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5388 - Site Engineering

Course introduces the fundamentals of site engineering which require understanding and interpreting landforms, slopes, contour lines, grading, drainage, and earthwork to storm water management, hydrology reports, designing roadways, and street networks. Other topics include designing for ADA and concepts of sustainability in site design. Note: CAD experience is recommended. Cross-listed with CVEN 4388. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5389 - Open Source Desktop Mapping, Modeling & Data Processing

This graduate-level course covers the open source tools and procedures that students can use for desktop GIS mapping, modelling, and data analysis and preparation that are unique in comparison to other GIS software used in the industry. Prereq: CVEN 5381 Intro to GIS or equivalent permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5390 - Interactive Web Mapping GIS

This course introduces students to designing, creating, delivering, and using interactive web maps. Many people rely daily on web maps to direct us from point A to point B and more. After starting with a broad introductory background, this is a technical hands-on course in which students use several open source (FOSS) technologies. Prereq: CVEN 5381 Introduction to GIS or equivalent or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5391 - Introduction to Geomatics

This course presents the concepts of Geomatics along with spatial data, tools, and their connection. This course covers spatial data collection methods, data assessment, and processing. The course also covers projections, methods of coordinate conversion and transformation, and data transfer across different spatial analysis platforms. Prereq: graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5392 - Unmanned Aerial Systems

This course presents concepts and practical methods of using Unmanned Aerial Vehicles for engineering projects. The course covers mission planning, operations, field data collection and processing, and data analysis. Legal and ethical considerations are also covered, as well as the relative costs and benefits of using UAV. Prereq: graduate standing or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5393 - Water Resources Development and Management

A multidisciplinary exploration of the principles governing water resources planning and development. Emphasis is on the sciences of water (physical, engineering, chemical, biological and social) and their interrelationships. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5394 - Water Resources Systems

Addresses the concepts, general processes, and quantification methods used in planning and analysis of water resource system planning and operations problems and goals, analysis methods, computer simulation and optimization. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5395 - GPS/GNSS

This course presents the practical concepts and implications of using GPS/GNSS for engineering projects. The course covers a variety of techniques for field data collection, processing, and data analysis. The course emphasis is on changes that are occurring because of using GPS/GNSS in the field. Prereq: graduate standing or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5401 - Introduction to Environmental Engineering

Provides a broad overview of the environmental engineering and pollution control system. Offers a unique systems approach to environmental engineering, examining the source-to-receptor feedback loop system of pollution control. Process principles underlying pollutant, transport, abatement, and control are presented in a unified manner, cross-cutting atmospheric, wastewater and subsurface systems. Prereq: CHEM 1130 and Graduate standing in MSCE or MSES programs or permission of instructor. Cross-listed with CVEN 3401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5402 - Integrated Environmental Modeling

Provides unified understanding of fundamental physical, chemical and biological processes that govern the transport and fate of pollutants in environmental systems - water, air and subsurface. The course focuses on multimedia modeling and model solution methods. The course also introduces exposure and risk assessment techniques. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5403 - Environmental Regulations and Management Systems

Students will receive an overview and understanding of major environmental laws and will be introduced to legal concepts used to develop environmental laws. In addition, students will learn about environmental management systems and their applications to environmental problems. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5404 - Sustainable Water Systems: Physical & Chemical Processes

A comprehensive course that covers the theory and application of chemical (acid base equilibria, redox reactions, chemical equilibrium and kinetics etc.) and physical processes (sedimentation, filtration, adsorption, membrane separation, reactor design) used in water quality engineering, with an emphasis on sustainable treatment options, looking at social, economic and environmental aspects of these technologies. Since numbers of these technologies are energy intensive, emphasis will be placed on life cycle impacts and energy efficiency of these processes. The lectures will integrate source water quality, local, geographical conditions and regulatory requirements into design of the treatment options. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5405 - Systems Analysis for Environment and Sustainability

Focuses on quantitative techniques for environment systems modeling, analysis and assessment. The course primarily covers life cycle assessment (LCA) techniques. The students will learn the various steps for conduction an LCA including goal and scope definition, life cycle inventory (LCI), life cycle impact assessment (LCIA) and interpretation. Mathematical techniques for uncertainty & sensitivity analysis, such as Monte Carlo simulations will be covered. Students will be exposed to several LCA case studies. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5406 - Engineering and Science Informatics

Students will learn applied, basic statistics & probability concepts and provide experience in the correct use and interpretation of those techniques. The course is designed in such a way that any graduate or undergraduate level student wanting to learn data analysis will benefit. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5406 - Engineering and Science Informatics

Students will learn applied, basic statistics & probability concepts and provide experience in the correct use and interpretation of those techniques. The course is designed in such a way that any graduate or undergraduate level student wanting to learn data analysis will benefit. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5427 - Storm Water System Design

This course covers urban watershed analysis, design rainfall and hydrologic losses, flood frequency and design event, rational method for peak runoff prediction, street hydraulic capacity and safety, culvert hydraulics, street inlet collection system, and storm sewer system design and flow analysis. Prereq: CVEN 3323. Cross-listed with CVEN 4427. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5434 - Sustainable Water Systems: Biological Processes

A comprehensive course that covers the theory and application of biological processes used in water quality engineering, with an emphasis on state-of-the-art water pollution control and waste-to-energy technologies. The initial lectures will introduce material on microbial energetics, diversity, and kinetics. The remainder of the course will involve the application of fundamental principles to treatment and energy recovery processes, including bioreactor configurations and design considerations. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5444 - Design of Solid Residuals and Natural Treatment Systems

Solid residuals treatment topics include thickening, dewatering, digestion, land application and composting. Natural treatment systems topics include slow rate, rapid, and overland flow land treatment systems; and constructed wetlands. Field trip required. Prereq: Graduate standing, MATH 2411, PHYS 2311 and ability to use spreadsheets. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5456 - Engineering Practice

Consulting engineering practice and management. Professional practice and organization. Marketing, ethics, personnel selection, and training. Planning, budgeting, work scheduling, resource allocation, and balancing. Oral and written communication, quality standards, and engineering management. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5457 - Administration of Public Works

A descriptive course concerned with the administration of engineering and planning aspects of urban public works. Prereq: Graduate standing in civil engineering or public administration, or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5460 - Introduction to Sustainable Urban Infrastructure

Focuses on developing uniform vocabulary on sustainable infrastructure across science & technology, architecture & planning, public policy, and health & behavioral sciences. Students learn concepts, principles/pathways and evaluation techniques for promoting the diffusion of sustainable urban infrastructures. Cross-listed with URPL 6399. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5461 - Defining and Measuring Sustainability

Unique cross-disciplinary course that teaches students community engagement strategies to define sustainability goals.

Life cycle assessment and material flow analysis tools used to measure environmental sustainability benchmarks. Field work applies both tools to cities in Colorado. Cross-listed with URPL 6548. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5462 - Theories of Sustainable Infrastructure Management

This seminar introduces theories of sustainable infrastructure management from a variety of disciplinary perspectives. Students then apply them to resolution of a variety of actual infrastructure management problems. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5464 - Fundamentals of Sustainability and Climate Change

This course explores environmental sustainability including a number of key themes: Climate-Water-Energy-Food-Ecosystem. A range of exercises and assignments are designed to encourage students to test their own assumptions and abilities to develop competencies in these areas. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5464 - Fundamentals of Sustainability and Climate Change

This course explores environmental sustainability including a number of key themes: Climate-Water-Energy-Food-Ecosystem. A range of exercises and assignments are designed to encourage students to test their own assumptions and abilities to develop competencies in these areas. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5480 - Hazardous Wastes and Site Remediation

Students learn to: (1) define and classify hazardous wastes encountered at hazardous waste-contaminated sites, (2) learn basic principles underlying currently available technologies for site remediation, (3) use EPA's technology screening matrix for technology selection, and (4) provide engineering design for selected remediation systems, e.g. ground-waterpump-and-treat, soil vapor extraction, soil washing, and bioremediation. Prereq: CVEN 5402. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5481 - Sustainable Water Systems Policy and Planning

To provide students with a working knowledge of sustainable urban water systems which are resilient, resource efficient and environment friendly. Students will learn about the various components of urban water and wastewater systems, including water resource management, treatment, transport and reuse, and how to evaluate, develop and design the various components in a sustainable manner. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5494 - Risk Assessment in Environmental Engineering

The process of determining the likelihood and extent of harm that may result from an activity or event. Topics covered are: hazard identification, dose-response evaluation, exposure assessment, and risk characterization. The subjects of risk management, risk perception, and risk communication are also discussed. Prereq: Graduate standing or permission of instructor. Cross-listed with ENVS 6200, HBSC 7340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5514 - Matrix Analysis of Structures

Matrix analysis of skeletal structures. Systematic formulation of stiffness and flexibility methods of analysis of skeletal structures. Application of modern computational tools to structural analysis, including introduction to the finite element method. Prereq: CVEN 3505. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5515 - Introduction to Finite Element Analysis

Systematic formulation and application of the finite element approximation to the solution of engineering problems. Topics include one- and two-dimensional elasticity problems, two-dimensional heat flow and irrotational fluid flow. Elements considered include triangular and quadrilateral elements formulated by elementary and isoparametric techniques. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5565 - Advanced Timber Structure Design

Design of wood framing systems including beams, columns, trusses, and diaphragms. Wood as a material, framing terminology, connection design, structural composite lumber, glued-laminated members, and plywood are covered. The course will emphasize on preparing students for a career in structural engineering. Prereq: CVEN 3505, Structural Analysis. Cross-listed with CVEN 4565. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5575 - Advanced Topics in Structural Steel Design

Plate buckling, plate girder design and other topics determined by class interest. Prereq: CVEN 4575. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5585 - Advanced Topics in Reinforced Concrete

Advanced topics relating to design and analysis of reinforced concrete structures. Prereq: CVEN 4585. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5602 - Advanced Street & Highway Design

This course delves into the art and science of designing sustainable and context sensitive street and highway facilities. Topics include road classification, transportation planning, road alignments, cross-section design, bicycle and pedestrian facilities, intersections, and street network design. Prereq: Permission of Instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5611 - Traffic and Safety Data Analysis

Covers statistical analysis methods for engineering studies in general, and for highway accident and traffic flow data in particular. Topics include data needs, sampling designs, survey methods, hypothesis testing, tests of proportions, non-parametric tests, analysis of variance, multivariate regression, and other tests of fit. Introductory overview of state and federal accident databases. Comparisons of accident rates by highway type, vehicle speeds, vehicle types, weather

conditions and other factors also presented. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5612 - Traffic Impact Assessment

Covers (1) procedures to satisfy state and local requirements for transportation impact studies, (2) methods to perform trip generation, distribution, and traffic assignment for impact analyses, and (3) analysis of transportation impacts on residential communities, mode choice, regional business (downtown or suburban), peak and off-peak travel times, noise, safety, parking and pedestrians. A course project requires students to develop an application of analysis software to a case study area. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5613 - Traffic Simulation Modeling

This graduate-level course introduces students to the principles, methods, and software needed to perform traffic simulations of alternative transportation modes in urban areas. Students will develop a case study simulation of their choosing. Pre-req: CVEN 5621 Highway Capacity Analysis or equivalent permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5621 - Highway Capacity Analysis

Covers the principles and applications of highway capacity analysis for freeways and arterials, ramps and interchanges, weave and merge sections, signalized and unsignalized intersections, roundabouts, pedestrian areas and transit. Emphasis is on level-of-service analysis procedures in the Highway Capacity Manual, although other approaches are also discussed. Additional topics include roadway characteristics, vehicle dynamics, human factors, speed and volume studies, travel time surveys and traffic flow characteristics. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5622 - Traffic Operations and Control

Covers principles of traffic flow and analysis methods for surface street traffic systems. Emphasis is on network modeling and simulation of coordinated signal systems, together with unsignalized intersections and freeway junctions using modern software tools. Additional topics include alternative signal timing plans, signal controllers, vehicle detection systems for volume, speed, occupancy and ramp metering. A course project requires students to develop and apply modeling software to a case study area. Prereq: CVEN 5621 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5631 - Travel Demand Forecasting

Introduces the urban transportation planning process as conducted by metropolitan planning organizations throughout the U.S. Course covers the four-step modeling process (trip generation, trip distribution, mode split and assignment). Topics also include data needs, survey methods, and statistical models for origin-destination estimation and travel demand forecasting. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5632 - Urban Transportation Modeling

An advanced coverage of urban and regional transportation planning models, procedures and software. Mathematical formulations, properties, and solution algorithms are presented. Additional topics include methods of data acquisition from public domain databases for use in modeling software. A course project requires students to develop an application of modeling software to a case study area. Prereq: CVEN 5631 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5633 - Case Studies in Sustainable Transportation

This course examines notable topics in sustainable transportation: demystifies conventional transportation engineering methods; and explores empirical examples of why such methods are often misguided. The intent is to enlighten engineering students and help support planning/policy students interested in transportation sustainability. Prereq: graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5641 - Transit System Design

This course introduces students to the components of transit system planning and design including station design and accessibility. The course focuses primarily on light rail design, but provides an overview of different transit modes. The instructors of this course have hands-on experience in transit planning, design, and construction. Prereq: graduate standing or permission of instructor. **Semester Hours:** 3 to 3

CVEN 5642 - Transit Construction

This course introduces students to the fundamentals of transit construction necessary for successful project completion. It also covers how many different types of transit projects are managed and sustained. The instructors of this course have hands-on experience in transit construction, scheduling, and project control. Prereq: graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5652 - Airport Planning and Design

National airport system plan, air travel demand, geometric design of airport facilities, design of airport pavement and drainage structures, and airport environmental impact. Prereq: CVEN 3602 and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5662 - Transportation System Safety

This is a graduate-level course on road safety that will: investigate contemporary safety analysis techniques; highlight the disconnect between the current safety paradigm and actual safety outcomes; cover driver, bicyclist and pedestrian safety concerns; and discuss notable efforts such as Vision Zero. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5682 - Pavement Design

Design of flexible and rigid pavements for highways and airports; stress analysis in flexible and rigid pavements; design of joints and reinforcing steel for rigid pavements; principles of subgrade stabilization. Prereq: CVEN 3141, 3505, and 3708. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5692 - Urban Traffic Workshop

Selected laboratory problems related to urban traffic. Prereq: CVEN 5642 or equivalent. Max hours: 3 Credits.

Semester Hours: 3 to 3

CVEN 5708 - Advanced Soils Engineering

A unified treatment of the foundation of soil engineering analysis. Topics include stress-strain-strength of soils; generalized limiting equilibrium analysis; stability analyses of earth-retaining structures, slopes, and shallow foundations; probabilistic approach of stability assessment; computation of settlement of foundations in sand and clay and time-rate of consolidation and critical state concept. Special attention is directed toward the illustration of theory through practical examples. Prereq: CVEN 3708, CVEN 4718, and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5709 - Settlement Analysis

A unified treatment of settlement analysis on sand and clay. Topics include settlement of shallow foundation, settlement of deep foundation, and settlement of embankments, walls and excavations. Conventional methods of analysis and the finite element method of analysis are covered. Critical design implications are emphasized. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5718 - Engineering Properties of Soils

Engineering properties of soils, including index properties, permeability, stress-strain behaviors, shear strength, compressibility, critical state soil models and their application in interpreting soil behaviors. Attention also is directed to laboratory and in situ tests to examine the validity of shear strength and compressibility theories and their application to stability and settlement analysis. Prereq: CVEN 3708, CVEN 4718, and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5719 - Design and Construction of Geosynthetic-Reinforced Soil Structures

Theory of reinforced soil; mechanical and hydraulic properties of geosynthetics; soil-geosynthetic interaction behavior; design concepts of GRS structures; design and construction of GRS retaining walls; design and construction of GRS embankments and slopes; design and construction of GRS foundations. Prereq: CVEN 5708. Max hours: 3 Credits.

Semester Hours: 3 to 3

CVEN 5728 - Groundwater and Seepage

Principles governing flow of water through soils. Approximate methods for confined and unconfined seepage problems, including flow nets, analog models, numerical methods, and method of finite elements. Analytical solutions for unconfined flow problems. Drainage filter design. Seepage toward wells. Stability of earth structures due to seepage. Prereq: CVEN 3708, CVEN 4718, and graduate standing or permission of instructor. Max hours: 3 Credits.

Semester Hours: 3 to 3

CVEN 5738 - Foundation Engineering

Methods of subsurface exploration and sampling of soils, lateral support in open cuts, control of groundwater, analysis and design of shallow foundations, analysis and design of deep foundations, bridge abutments and cofferdams, underpinning, and application of modern computational techniques to analysis and design of foundations. Prereq: CVEN 5708, CVEN 5718, and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5748 - Design of Earth Embankment Dams

Theory, design, and construction of earth embankments. Use of published data, field exploration, laboratory tests on soils and rock in investigating foundations, and construction materials. Principles of compaction and settlement. Slope stability analysis, landslide, recognition and control, use of benches and beams. Prereq: CVEN 3708, CVEN 4718, and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5758 - Foundations on Expansive Soils

Expansive soils swell upon wetting because of the swelling nature of constituent clay minerals, particularly montmorillonite. This course studies swelling nature of different clay minerals, effects of wetting, swelling potential, swelling pressures, and design of different foundation systems. Prereq: CVEN 4738, B.S.C.E. or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5768 - Introduction to Rock Engineering

Nature of rock masses, geological exploration, deformability and strength, in situ stresses and deformation, rock hydraulics. Prereq: CVEN 3708, CVEN 4718 and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5778 - Applied and Experimental Rock Mechanics

Surface exploration and characterization of rock masses, slope stability, analysis of rock masses; rock mass reinforcement; tunnel and shaft designs, design of underground rock chambers; foundations on rocks; and dam design. Prereq: CVEN 5768 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5780 - Engineering Geology

Studies geology as utilized in engineering and environmental practice. Emphasizes a conceptual integration of geologic materials, processes, and rates of change as a basis for successful application of geologic knowledge to environmental planning and engineering design projects. Prereq: MATH 2411 and CVEN 2121. Cross-listed with CVEN 4780 and GEOL 4780/5780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5788 - Design and Construction of Municipal Solid Waste Disposal Facilities

NIMBY (Not In My Back Yard) and environmental regulations demand that all landfills receive proper engineering design. This course covers regulations, management (reduction, collection, transportation, transformation, recycling, incineration, disposal), and disposal facility design. Prereq: Senior in CVEN, B.S.C.E. or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5792 - Energy Resources and Systems for Sustainability

Introduction to energy resources including coal, oil, natural gas, nuclear, hydro, wind, solar, biomass and geothermal. Resource utilization in power systems incorporating issues of sustainability, demand trends, pollution and future use. Interdisciplinary presentation of engineering, physical science, and economic principles. Prereq: Physics, Engineering Mechanics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5798 - Dynamics of Soils and Foundations

Principles of vibrations of, and wave propagation in, elastic, homogeneous, isotropic media; laboratory and in situ measurements of soil properties; applications of these principles and properties to the design of foundations subject to dynamic loading generated by machinery, earthquakes, or blasts. Prereq: CVEN 5708, 5718, and graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5800 - Special Topics

Topical courses offered once or on irregular intervals. Typical topics include: computer-aided structural engineering, pre-stressed concrete, non-matrix structural analysis, geotechnical aspects of hazardous waste management, geographic information systems and facility management, groundwater hydrology, engineering project management, structural planning, engineering practice, spreadsheet application, field instrumentation, hazardous wastes engineering, bridge super and substructure design, advanced steel design, hydraulic transients, foundations -- expansive soils, sludge process design. Prereq: Variable. Max hours: 9 Credits. **Semester Hours:** 3 to 3

CVEN 5835 - Advanced Timber Structure Design

Design of wood framing systems including beams, columns, trusses, and diaphragms. Wood as a material, framing terminology, connection design, structural composite lumber, glued-laminated members, and plywood are covered. The course will emphasize on preparing students for a career in structural engineering. Prereq: CVEN 3505, Structural Analysis. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5840 - Independent Study

Available only through approval of the graduate advisor. Subjects arranged to fit needs of particular student. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CVEN 5939 - Internship

Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 5950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

CVEN 5960 - Master's Report

Max hours: 8 Credits. **Semester Hours:** 1 to 8

CVEN 6111 - Dynamics of Structures

Linear and nonlinear dynamic matrix analysis of multi-degree-of-freedom structural systems. Analysis and design for wind and earthquake loads including modal analysis and sub structuring techniques. Computer programming. Prereq: CVEN 5111. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6131 - Theory of Elasticity

Mathematical theory of elasticity and its applications to engineering problems. Discussion of the basic analytical and numerical methods of solutions. Prereq: CVEN 5121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6165 - Buckling in Structures

Buckling of columns, beams, frames, plates, and shells in the elastic and plastic range. Post-buckling strength of plates. Beam-columns. Analysis by exact and approximate methods with special emphasis on practical implications and application of solutions. Prereq: CVEN 3121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6336 - Urban Flood Control System Design

This course covers urbanization impact on watershed regime, flood control measures, detention and retention system, infiltration basin, sand filter, water quality control basin, wetland preservation, storm water Best Management Practices, low impact development, outlet structure design, pond safety, stream restoration, overflow risk analysis and optimal operation. Prereq: CVEN 5333, 5343 and graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6353 - Hydraulic Design

Design of small dams, including reservoir sizing, spillways, and energy dissipaters. Design of urban drainage and flood control facilities such as culvert transitions, roadside ditches, street inlets, detention/retention ponds, storm sewer systems, drainage channels, and channel erosion controls including vegetation, concrete, riprap protection. Design of flood plain encroachment, natural channel improvement, and bridge hydraulics. Prereq: CVEN 5333 and 5343. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6515 - Advanced Theory of Structures

Generalized approaches to the analysis of civil engineering and continuous elastic structures (such as plates and plane stress bodies) by force and displacement methods. Emphasis is on formulation by finite elements and solution by matrix methods. Prereq: CVEN 5515 and basic knowledge of computer programming. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6738 - Finite Element Method in Geotechnical Engineering

Topics covered include: review of finite element methods, advantages and limitation of FEM for analysis of geotechnical engineering problems, one- and two-dimensional seepage analysis, consolidation analysis, incremental and iterative procedures in nonlinear analysis, no-tension analysis, simulation of construction sequence, simulation of soil behavior, simulation of interface behavior, and load-displacement analysis of earth structures. Prereq: CVEN 5708 and 5515 or consent of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

CVEN 6840 - Independent Study

Max hours: 6 Credits. **Semester Hours:** 1 to 6

CVEN 7800 - Special Topics

Credit and subject matter to be arranged. Prereq: Variable. Max hours: 6 Credits. **Semester Hours:** 1 to 6

CVEN 7840 - Independent Study

Available only through approval of the graduate advisor. Subjects arranged to fit needs of particular student. Max hours: 6 Credits. **Semester Hours:** 1 to 3

CVEN 7990 - Doctoral Dissertation

Max hours: 10 Credits. **Semester Hours:** 1 to 10

CVEN 8990 - Doctoral Dissertation

Max hours: 15 Credits. **Semester Hours:** 1 to 15

DSCI 3780 - Supply Chain Management

Over the last decade businesses have started to understand how the design and operation of their supplier network can be a source of competitive advantage. Supply chain management is concerned with the activities around communication, managing inventory, warehousing, transportation and facility location. The course objectives are to understand a supply chain/network from the strategic, planning and operations perspectives and to develop skills that allow you to analyze the responsiveness and effectiveness of the network. Prereq: DSCI 2010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSCI 6440 - Quality and Process Improvement

Studies the identification, measurement and improvement of quality and the practical management issues related to implementing quality systems within organizations. Topics include historic and contemporary views of quality, statistical quality control tools including Six SigmaSM, work design and measurement and process flow and design. Prereq: BUSN 6530 with a grade of "C" or better . Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSCI 6822 - Services Operations

Examines the unique issues involved in the management of service operations. Operations management principles specific to service industries are given in-depth. In addition, simulation is introduced as a technique for studying service industries. Prereq: BUSN 6530 or permission of instructor. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSEP 6000 - Academic Writing for Doctoral Students

Tailored for graduate students in education. Focuses on techniques for improving academic writing, particularly planning, organizing, drafting, revising, and editing papers, i.e. course assignments, portfolio products, doctoral proposals or dissertation chapters. Prereq: Admission to doctoral program. Max hours: 3 Credits. **Semester Hours:** 1 to 1

DSEP 6010 - APA Conventions in Academic Writing

This workshop, specifically directed to doctoral students, concentrates on practical issues involved in documenting sources and following conventions for other text features using the current Publication Manual of the American Psychological Association and updates posted on the APA Web site. Prereq: Admission to the doctoral program. Max hours: 1 Credit. **Semester Hours:** 1 to 1

DSEP 6020 - Advanced Academic Writing for Doctoral Students

This workshop is designed for doctoral students in education. Focuses on practical strategies for managing, organizing, revising and editing academic papers, especially complex writing projects such as dissertation proposals and dissertation chapters. Prereq: DSEP 6000 or permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 1

DSEP 7830 - Special Topics

Special topics that reflect current research and scholarly exploration of leadership and innovation. Max hours: 9 Credits. **Semester Hours:** 1 to 6

DSEP 7840 - Independent Study: DSEP

Max hours: 9 Credits. **Semester Hours:** 1 to 4

DSEP 8994 - Doctoral Dissertation

Doctoral dissertation coursework toward the completion of a EdD or PhD degree in Education. Max hours: 30 Credits. **Semester Hours:** 1 to 10

DSPL 7011 - Research Design

Students are provided with a 'hands on' understanding of methodological issues to become both intelligent consumers of social science research and competent producers of empirically based knowledge. The course moves through the research process covering hypothesis formulation, research design, data collection, measurement, and some fundamentals of statistical inference. Prereq: Admission to the PhD program in Design and Planning or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSPL 7012 - Theories of Planning

Examines theories of planning and problems of plan implementation. Review and assesses a range of theories of intervention - market imperfections, political economy, regulations, community, rationality, and communication - relying on examples from students research as well as case studies developed by students. Prereq: Admission to the PhD program in Design and Planning or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSPL 7013 - Environment and Behavior

Explores contributions of social research to understanding what facilitates and motivates people's adoption of sustainable environmental behaviors. It examines personal and collective behaviors, at scales that range from buildings to global environmental change, in the developed and developing world. Prereq: Admission to the PhD program in Design and Planning or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSPL 7014 - Colloquium

Presentations of research projects by students, college faculty members and visitors. Max hours: 9 Credits. **Semester Hours:** 1 to 3

DSPL 7015 - Historiography and Architecture

Advanced seminar concerning the study of the written record of the past and how it is established. Readings focus on canonic texts formative to the discipline and the strategies they offer for historical research. Prereq: "Course is offered to doctoral students but masters students may enroll with instructor approval." Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSPL 7016 - Architecture, in Theory

Explores theories and texts that have influenced the analysis and the production of architectural form. The focus is on the expressive potential of architectural forms and the modalities of the realization of this potential. Prereq: "Course is

offered to doctoral students but masters students may enroll with instructor approval." Cross-listed with ARCH 6254. Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSPL 7017 - Pro-Seminar

Advanced, graduate-level course (seminar, independent-study, or other) addressing the history of architecture, landscape, or urbanism. Prereq: "Course is offered to doctoral students but masters students may enroll with instructor approval." Max hours: 3 Credits. **Semester Hours:** 3 to 3

DSPL 7686 - Special Topics in Design and Planning

Various topical areas in design and planning are studied, including those in history, theory, methods, and practice. Max hours: 18 Credits. **Semester Hours:** 1 to 3

DSPL 7840 - Independent Study: DSPL

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to design and planning. Prereq: Permission of instructor. Max hours: 18 Credits. **Semester Hours:** 1 to 3

DSPL 7950 - Doctoral Thesis Research

Conducting research for doctoral dissertation, including data collection, analysis and presentation of findings. Prereq: Completion of core of PhD program. Max hours: 30 Credits. **Semester Hours:** 1 to 10

ECED 2930 - Infant & Toddler Field Experience & Seminar

ECED 2930 is designed to support teacher candidates in making theory-to-practice connections, focused on understanding infant and toddler development. Students will spend one day per week in an infant-toddler classroom and engage in a weekly seminar to mediate learning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 2931 - ECE Field Experience I

Includes a classroom seminar (5 sessions--15 clock hours) and placement in a child care/educational setting (90 clock hours—14 weeks at 6-7 hours per week). Supervised placement provides the student with the opportunity to observe children, to practice appropriate interactions, and to observe effective guidance and management techniques. Coreq: ECED 4000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 2932 - ECE Field Experience II

Opportunity to supplement course work with practical hands-on experience (45 clock hours) in early childhood classroom—apply knowledge and practice skills learned in educational program. Students work under the immediate supervision of experienced personnel in an early childhood education setting. Prereqs: PSYC 3205, ECED 4000 (or

ECE 101), ECED 2931 (or ECE 102), ECED 4102. Coreq: ECED 2932 may be completed concurrently with ECED 4102. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ECED 4000 - ECE as a Profession

Overview of the early childhood profession and the philosophical and historical foundations of services to young children and their families. Standards for early childhood care and education, professionalism, code of ethical conduct, and key areas of ECE professional knowledge are examined. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4010 - Social Studies & Creative Arts

Value of play and creative arts in early childhood; integration of visual arts, music, dance/movement, drama and social studies into the K-3 classroom curriculum; instructional design; authentic assessment, and evidence-based practice for adapting the curriculum for diverse learners. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4020 - Science for P-2 Classrooms

Focuses on teaching science in preschool, kindergarten and primary grades, including knowledge of state and district science content standards, process standards, assessment, effective instructional strategies, evidence-based practice for adapting the curriculum for diverse learners, and appropriate use of materials. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4030 - Nutrition, Health, and Safety

This course focuses on nutrition, health, and safety as a key factor for optimal growth and development of young children. Content includes nutrient knowledge, menu planning, food program participation, health practices, management and safety, appropriate classroom activities and communication with families. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4040 - Administration of Early Childhood Care and Education Programs

Knowledge and skills required of administrators to effectively lead and manage early childhood programs: Colorado's licensing requirements, quality standards, program philosophy, organization infrastructure, policies, budget, staffing, and marketing. Director's administrative skills and role in community collaboration and advocacy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4060 - Working with Families, Professionals, and Communities

Focuses on the human relations component of an early childhood professional's responsibilities including director-staff relationships, staff development, leadership strategies, family-centered practice, culturally-responsive practices, family involvement, parent-professional partnerships, and community interaction. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4070 - Development and Education of Infant and Toddlers

Focuses on the growth and development of infants and toddlers; responsive caregiving practices; observing development; relationship-based approach to curriculum and guidance; health, safety, and nutrition issues. Investigates state requirements for licensed infant/toddler homes and centers and accreditation and quality standards. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4102 - Developmentally Appropriate Curriculum Methods and Techniques

Overview of early childhood curriculum development including processes for planning and implementing developmentally appropriate environments, materials, and experiences. Examines curriculum models and approaches for promoting development and learning in all developmental domains. Evidence-based practices for assessing young children. Prereq: PSYC 3205, ECED 4000 (or ECE 101), ECED 2931 (or ECE 102). Coreq: ECED 4102 may be completed concurrently with ECED 2932. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4200 - Assessment for Early Childhood Classrooms

This course reviews observation/assessment of young children—purpose, tools, and methods for children birth-age 8. Defines measurable outcomes, progress monitoring and use of assessment data to improve early intervention, curriculum planning, intentional teaching, instructional design, and monitor child outcomes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4202 - Classroom Management

This course presents evidence-based classroom strategies to promote social competence, build classroom community and reduce or prevent behavior problems. Emphasis is placed on understanding child development and observing behavior to make decisions for children ages birth through age 8. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4300 - Exceptional Learners in the Early Childhood Classroom

Educating young children with disabilities in the early childhood setting: typical and atypical development, theoretical models, policy and legal requirements, evidence based research related to instructional design, intervention/curriculum planning and implementation. Introduction to embedded instruction and inclusive environments. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4410 - Using Coaching Skills in Early Childhood Settings

This course focuses on the fundamentals and recommended practices of relationship-based coaching using a systematic, individualized, reflective approach. Throughout the course students will apply these strategies to fieldwork experiences in early childhood settings, applicable to any ECE curriculum or model. Cross-listed with ECED 5410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4420 - Connecting Awareness With Application & Deepening Of Practice

This course will identify effective ongoing support strategies for individuals providing coaching. Participants will

integrate skills from ECED 5410 with effective application in real life coaching experiences. Prereq: ECED 4410 or instructor permission. Cross-listed with ECED 5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4430 - Attuning For Personal And Organizational Change

This course is designed to support the coach in creating a social learning climate where a synergy of shared learning and reflective dialogue about practice are examined, analyzed and refined. Prereq: ECED 4410 & 4420 or instructor permission. Cross-listed with ECED 5430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4910 - Student Teaching: Infant Toddler

Teacher candidates apply learning from coursework to practice in the care and education of infants and toddlers, working in their infant toddler placement setting two days per week for eight weeks or one day per week for 16 weeks. Max hours: 2 Credits. **Semester Hours:** 2 to 2

ECED 4912 - Student Teaching: Preschool

Culminating student teaching project to provide evidence of proficiency on Performance-Based Standards for Colorado Teachers and Early Childhood Education competencies. Teacher candidates work in preschool setting two days per week for eight weeks or one day per week for 16 weeks. Successful completion of all ECED courses prior to semester of student teaching and passing score on ECE PLACE exam. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 4914 - Student Teaching: Primary K-3

Culminating student teaching project to provide evidence of proficiency on Performance-Based Standards for Colorado Teachers and Early Childhood Education competencies. Teacher candidates work in primary setting 4-5 days per week for 16 weeks. Successful completion of all ECED courses prior to semester of student teaching and passing score on ECE PLACE exam. Max hours: 6 Credits. **Semester Hours:** 6 to 6

ECED 4931 - Internship I & Collaborative Learning Community

ECED 4931 is the first of 3 internships in the professional year of the ECE program plan that provides the necessary learning opportunities for candidates to gradually develop their practice in order to be licensed as an early childhood educator. Note: Professional Year Admission required. Max hours: 2 Credits. **Semester Hours:** 2 to 2

ECED 4932 - Internship II & Collaborative Learning Community

ECED 4932 is the second of 3 internships in the professional year of the ECE program plan that provides the necessary learning opportunities for candidates to gradually develop their practice in order to be licensed as an early childhood educator. Prereq: ECED 4931. Note: restricted to Professional Year Admission. Max hours: 2 Credits. **Semester Hours:** 2 to 2

ECED 5010 - Curriculum in Early Childhood Education

Review of principles of early childhood curriculum and program development. Linkages are made between theoretical bases of development and curriculum planning. Curriculum areas considered include language and literacy, mathematics, motor, social-emotional, science, social studies and aesthetic development. Max hours: 6 Credits.

Semester Hours: 3 to 3

ECED 5040 - Administrative Seminar

Emphasizes topics required of administrators to effectively lead and manage early childhood inclusive classrooms or other related programs including leadership capacity, professionalism, administration, teaming/collaboration, communities of practice, staff management, safety, and professional development. Max hours: 6 Credits.

Semester Hours: 3 to 3

ECED 5060 - Working with Families and Communities

Theories, practices and research related to working with families and communities. Topics include: social systems perspective, family structures and forms; family support systems; family-centered practice; family/professional partnerships; effective communication; and working with parents of children with special needs. Max hours: 6 Credits.

Semester Hours: 3 to 3

ECED 5070 - Social Competence and Classroom Supports

Emphasizes prevention, positive behavioral interventions and support, and social/emotional development for children birth to eight. Focus on the practical application of intervention strategies based on current research and evidence-based practices. Cross-listed with ECED 7070. Max hours: 3 Credits.

Semester Hours: 3 to 3

ECED 5080 - Language and Literacy in Young Children

Overview of theories and research in early language and literacy development. Emphasis on sociocultural beliefs and practices associated with the use of language and literacy in the different contexts. Information about language disorders found in early childhood settings is discussed. Max hours: 6 Credits.

Semester Hours: 3 to 3

ECED 5091 - Educators as Social Change Agents

Focus on developing knowledge, skills and dispositions to advance equity and social justice in classrooms, programs, and communities to activate educators as social change agents and implement quality inclusive practices for young children from diverse backgrounds. Max hours: 3 Credits.

Semester Hours: 3 to 3

ECED 5102 - Introduction to Developmentally Appropriate Curriculum

Introduces developmentally appropriate curriculum and instructional practices in early education and the elementary grades. Subject areas considered include literacy, language arts; mathematics, computers, blocks; science, outdoor education; social studies, thematic units; and art, drama, music, physical activity. Max hours: 6 Credits.

Semester Hours: 1 to 3

ECED 5104 - Advanced Developmentally Appropriate Curriculum

Extends earlier learning about developmentally appropriate curriculum and instructional practices in early education and the elementary grades. Students elaborate their knowledge of subject area materials and activities. A curriculum unit that is developmentally appropriate is planned, implemented and evaluated. Prereq: ECED 5102. Max hours: 4 Credits. **Semester Hours:** 1 to 3

ECED 5110 - Advanced Infant and Toddler Development:

Focuses on development of infants/toddlers to inform responsive caregiving practices. Develop observation skills to understand infant/toddler behavior. A relationship-based approach to curriculum is emphasized. State requirements for licensed infant/toddler programs, accreditation and quality standards are discussed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5200 - Screening and Assessment of Young Children

Provides knowledge and field-based experience in the administration and scoring of screening and assessment for infants, toddlers, and preschool children. Understand and administer a variety of formal and informal measures including screening, evaluation, play-based and curriculum-based assessments. Cross-listed with ECED 7500. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ECED 5202 - Classroom Management to Promote Positive Behavior

Evidence-based classroom management strategies to promote social competence and reduce behavior problems. Includes strategies for responding to challenging behavior and developing individualized behavior support plans. Explores factors that influence the lives of young children including family disruption, stress, violence and trauma. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ECED 5210 - Overview of Infant Toddler Autism Services

This course will provide students with a general introduction to the legal and procedural elements that characterize state-of-the-art services to infants and toddlers with ASD. The course will review the Federal mandate for services, principles of practice, and evidence-based teaching strategies for children with autism. Must be accepted into the Infant Toddler Autism Certificate Program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5211 - Applied Treatment Delivery for Infants and Toddlers with ASD

The course explores current treatment methods and philosophies for young children with Autism Spectrum Disorder (ASD). Common intervention approaches are reviewed, with discussion of the evidence base of each. Intervention goals covered address language, play/socialization, early adaptive skills, and positive behavior. Must be accepted into the Infant Toddler Autism Certificate Program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5212 - Coaching for Families Infants/Toddlers w/ Autism

This course provides the knowledge and skills necessary to implement recommended, evidence-based practices with families of infants and toddlers with or at risk for ASD. The course will review current evidence based strategies for supporting families, collaborating with families, and using evidence-based family coaching strategies. Must be accepted into the Infant Toddler Autism Certificate Program Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5300 - Pedagogical Leadership

This course covers early childhood curriculum models and evidence-based interventions applicable within community, preschool, and home environments. This includes perspectives and views related to the inclusion and support for young children with special needs and their families. Prereq: Must be admitted to the Buell Early Childhood Leadership Program (BECLP). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5310 - Professional Development

This course focuses on the competencies required to develop and implement effective professional development for all adults participating in the ECE system. It also explores the importance of family centered practice in early childhood and implications for programs and policies. Prereq: Must be admitted to the Buell Early Childhood Leadership Program (BECLP) Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5320 - Reflective Leadership and Capstone

The course focuses on the leader's role in promoting inquiry as a means to improve the ECE field. Students will gain experience with community-based action research as a methodology for addressing critical systems and program issues affecting their work. Prereq: Must be admitted to the Buell Early Childhood Leadership Program (BECLP). Max hours: 4 Credits. **Semester Hours:** 4 to 4

ECED 5330 - Leadership and Ethics

Leadership and Ethics in early childhood is the exercise of significant and responsible influence. This course covers current theories and models of leadership. Students will articulate a vision, clarify, and affirm values, and create a culture built on norms of continuous improvement and ethical conduct. Prereq: Must be admitted to the Buell Early Childhood Leadership Program (BECLP). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5350 - Policy and Advocacy in Early Childhood

This course provides the historical and political context of early care and education in the United States. Local, state and federal mandates, public laws, and legislative procedures and initiatives will be investigated. Prereq: Must be admitted to the Buell Early Childhood Leadership Program (BECLP). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5410 - Using Coaching Skills in Early Childhood Settings

This course focuses on the fundamentals and recommended practices of relationship-based coaching using a systematic, individualized, reflective approach. Throughout the course students will apply these strategies to fieldwork

experiences in early childhood settings, applicable to any ECE curriculum or model. Cross-listed with ECED 4410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5420 - Connecting Awareness With Application & Deepening Of Practice

This course will identify effective ongoing support strategies for individuals providing coaching. Participants will integrate skills from ECED 5410 with effective application in real life coaching experiences. Prereq: ECED 5410 or instructor permission. Cross-listed with ECED 4420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5430 - Attuning For Personal And Organizational Change

This course is designed to support the coach in creating a social learning climate where a synergy of shared learning and reflective dialogue about practice are examined, analyzed and refined. Prereq: ECED 5410 & 5420 or instructor permission. Cross-listed with ECED 4430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 5800 - Workshop: Topics in Early Childhood Education

Topics and credit hours vary from semester to semester. Max hours: 12 Credits. **Semester Hours:** 1 to 4

ECED 5840 - Independent Study

Max hours: 9 Credits. **Semester Hours:** 1 to 4

ECED 6010 - Literacy and Mathematics K-2

Principles of early reading and mathematical development for grades K-2 including diverse instructional strategies and differentiation for children with disabilities. Linkages are made between child development and learning expectations for mathematics, reading and writing and curriculum planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 6100 - Medical and Physiological Aspects of Development

Presents medical and physiological aspects of development including an understanding of chronic illness/medical fragility in young children and the effects on families, school, and community. Examination and professional responses to cultural interpretation of medical issues are discussed. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ECED 6200 - Early Intervention Strategies

Explores current research, knowledge, and skills related to evidence-based intervention strategies and service delivery in high quality inclusive settings for young children with special needs from infancy through age eight. Cross-listed with ECED 7200. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ECED 6690 - Seminar: Research and Current Issues in Early Childhood Education

Research methods are reviewed and then selected topics are considered. Emphasis is on research findings and current issues of importance to teachers, administrators, specialists, collaborator/consultants, and researchers in early childhood and early childhood special education. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ECED 6910 - Early Childhood Special Education Infancy Practicum

Supervised field-based experiences in settings for children with disabilities and at-risk infants, toddlers, and their families. Prereq: ECED 5010, 5070, 5080, 5200, 6100, and 6200. Max hours: 12 Credits. **Semester Hours:** 1 to 4

ECED 6911 - Practicum in Early Childhood Education

Field-based experiences in settings for young children (preschool administration, day-care center management, community college teaching, parent program directorship, etc.) that are closely linked to the students' professional goals. Requires a minimum of 75, 150, 225, or 300 clock hours under supervision (for 1, 2, 3, or 4 credit hours, respectively). Prereq: Considerable course work in early childhood education. Max hours: 8 Credits. **Semester Hours:** 1 to 4

ECED 6912 - Early Childhood Special Education Preschool Practicum

Supervised field-based experiences in settings for young children with disabilities and their families, including school districts and community agencies. Prereq: ECED 5010, 5070, 5080, 5200, 6100, and 6200. Max hours: 8 Credits. **Semester Hours:** 1 to 4

ECED 6914 - Early Childhood Special Education Primary Practicum

Supervised field-based experiences in kindergarten through second grade settings with typically developing children, children with special needs and special education teams. Prereq: ECED 5010, 5070, 5080, 5200, 6100, and 6200. Max hours: 8 Credits. **Semester Hours:** 1 to 4

ECED 6950 - Master's Thesis

Prereq: RSEM 5100, RSEM 5200 and credits in the Early Childhood Education program. Max hours: 4 Credits. **Semester Hours:** 4 to 4

ECED 7000 - Early Childhood Leadership Seminar I

The course is designed to provide an overview of policies, laws, and leadership skills in early childhood. Students will study specific policies and laws influencing (1) services for children with severe challenging behavior and autism, (2) children from culturally and linguistically diverse families, and (3) professional development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 7002 - Early Childhood Leadership Seminar II

The purpose of the course is to provide scholars with leadership knowledge and skills to implement policies, laws, programs, and systems that support the use of evidence-based practices with young children with disabilities. Prereq: ECED 7000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 7004 - Early Childhood Leadership Seminar III

The purpose of this seminar is to provide the knowledge and skills to implement evidence-based practices in early childhood settings. This seminar will focus on policies and practices that support implementation, scale-up, and sustainability of evidence based practices in early childhood systems. Prereq: ECED 7002. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ECED 7070 - Social Competence and Classroom Supports

Emphasizes prevention, positive behavioral interventions and support, and social/emotional development for children birth to eight. Focus on the practical application of intervention strategies based on current research and evidence-based practices. Cross-listed with ECED 5070. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ECED 7200 - Early Intervention Strategies

Explores current research, knowledge, and skills related to evidence-based intervention strategies and service delivery in high quality inclusive settings for young children with special needs from infancy through age eight. Cross-listed with ECED 6200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECED 7500 - Screening and Assessment of Young Children

Provides knowledge and field-based experience in the administration and scoring of screening and assessment for infants, toddlers, and preschool children. Understand and administer a variety of formal and informal measures including screening, evaluation, play-based and curriculum-based assessments. Cross-listed with ECED 5200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 1010 - Economics of Social Issues

This course is designed for non-majors. Majors in economics will not receive credit toward departmental degree requirements. The focus of the course is on current issues in the economy, including poverty, social security, airline deregulation, government control of prices, economics of higher education, free trade, race and gender discrimination, unemployment, the role of government, and the national debt. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ECON 2012 - Principles of Economics: Macroeconomics

Covers topics of inflation, unemployment, national income, growth and problems of the national economy, stabilization policy, plus others at the discretion of the instructor. Purpose is to teach fundamental principles, to open the field of economics in the way most helpful to further a more detailed study of special problems, and to give those not intending to specialize in the subject an outline of the general principles of economics. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS1. **Semester Hours:** 3 to 3

ECON 2022 - Principles of Economics: Microeconomics

Topics include price determination in a market system composed of households and firms; resource allocation and efficiency of various market structures, plus others at the discretion of the instructor. Note: Complementary to and normally taken following ECON 2012. ECON 2012 is not a prerequisite for ECON 2022. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS1. **Semester Hours:** 3 to 3

ECON 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ECON 3050 - Decision Making

This course discusses current research on decision making/behavioral economics, as well as its application to individual well-being and public policy. You will gain insights on how and why people can be irrational in their daily decisions. Cross-listed with PBHL 3050 and PSYC 3050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 3100 - Economics of Race and Gender

Overview of the determinants of wages, employment and education in the labor market. Emphasizes the investigation of the evidence and theories of differentials that appear to be associated solely with race and sex, and public policies associated with discrimination and poverty. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 3300 - Economics of Crime and Punishment

Presents the economic approach to crime. Teaches economic reasoning in the analysis of the determinants of criminal activity, provides an in-depth analysis of the importance of socioeconomic factors in determining crime. Investigates the relative importance of labor market conditions, deterrence, and other factors in the level of criminal activity. Also covers topics to reduce crime such as, the death penalty, issues around victimless crime and public choices. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 3366 - Managerial Economics

Presents the basic core of economic theory and its use for sound managerial decision making. Emphasis on the practical

applications of the concepts learned in economics to the resolution of everyday problems. Prereq: ECON 2012 and 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 3400 - Economics of Sex and Drugs

Examines the political and policy issues surrounding controversial topics in human behavior. Economic models and reasoning are applied to examine issues such as juvenile substance use and abuse, and teen pregnancy. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 3801 - Introduction to Mathematical Economics

Introduces the use of mathematics in micro- and macro-economic analysis. Emphasis on model-building techniques, solution methods, and economic interpretations. Prereq: ECON 2012(can be taken concurrently), ECON 2022, and College Algebra or MATH 1130 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 3811 - Statistics with Computer Applications

Introduces statistical methods and their application to quantitative problems in economics and social sciences. Note: Recitation is required. Prereq:ECON 2022 (can be taken concurrently), and College Algebra. Max hours: 4 Credits. **Semester Hours:** 4 to 4

ECON 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ECON 4001 - Topics in Economics

Studies special topics in economics to be selected by the instructor. Note: May be repeated for credit when topics vary. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ECON 4030 - Data Analysis with SAS

Covers techniques for handling and interpreting economic data and conducting econometric analyses using SAS programming. Provides hands-on data management and analyses with large data sets with applications to business and economics, and prepare students for SAS Base Programmer certification exam. Prereq: ECON 3811 or equivalent. Cross-listed with ECON 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4050 - Special Economic Problems

Provides students the opportunity to critically evaluate some practical and theoretical problems under supervision, and to present results of their thinking to fellow students and instructors for critical evaluation. Prereq: ECON 2012 and

ECON 2022. Note: ECON 4050 for majors in economics, others by permission of instructor. Cross-listed with ECON 5050. Max hours: 9 Credits. **Semester Hours:** 1 to 8

ECON 4071 - Intermediate Microeconomic Theory

Production, price and distribution theory. Study of value and distribution theories under conditions of varying market structures, with special references to the contribution of modern theorists. Prereq: ECON 3801 with a C- or higher or Calculus II or Calculus III with a B or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4081 - Intermediate Macroeconomic Theory

National income and employment theory. Primary emphasis placed on determination of employment and prices. Problems of unemployment and inflation analyzed and appropriate policies considered. Prereq: ECON 3801 with a C- or higher or Calculus II or Calculus III with a B or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4090 - History of Economic Thought

Traces the development of economic thought from ancient times to the 20th century. Considers the context in which these ideas were developed and their relationship to modern economic thought and contemporary economic problems. Note: Students may not receive credit for this course if they have already received credit for ECON 4091. Prereq: ECON 2012 and ECON 2022. Cross-listed with ECON 5090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4101 - Applied Statistics Using SAS and SPSS I

Teaches the practical statistical tools social scientists use to analyze real-world problems. Split into four modules, each taught by a different instructor. The first module introduces SAS and SPSS; modules 2-4 are problem-based and cover topics such as ANOVA, multivariate regression, and cluster analysis. Prereq: Any statistics course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4102 - Applied Statistics Using SAS and SPSS II

(Continuation of ECON 4101.) Students use the skills they learned in the previous semester to analyze a social issue of their choosing and present their findings. Note: In addition to lectures, weekly one-on-one meetings between faculty and students are required. Prereq: ECON 4101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4110 - Money and Banking

Surveys major monetary and fiscal institutions such as commercial banks, the federal reserve system, savings institutions, and the structure of debt. The relationships between households, firms and financial intermediaries are explored, and the tools available to macroeconomic policy makers are described and evaluated. Prereq: ECON 4081. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4150 - Economic Forecasting

Teaches forecasting techniques used in business and government to project trends and short-term fluctuations. Actual data are employed in instruction and labs. State-of-the-art spreadsheet and algorithms are introduced as part of the course work. Prereq: ECON 4811 or permission of instructor. Cross-listed with ECON 5150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4210 - Public Finance

Surveys topics dealing with the economics of government activity, including the provision of public goods; the economics of the political process; welfare programs; pollution externalities; benefit-cost analysis; the U.S. tax structure; and the effects of taxes on economic behavior, economic performance and the distribution of income. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4230 - Law and Economics

Applies economic theory to legal decision making. Topics include property law, tort law, contract law, the common law, crime and punishment, comparisons to traditional forms of legal decision making and the economic approach to politics. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4240 - Economic Policy Analysis

Deals with the application of economic analysis to the government policy-making process. Topics include public goods provision, externalities, cost-benefit analysis, judicial decision making, the economic analysis of the political process, government regulation of business, and tax incidence. Prereq: ECON 2012, 2022 and 3801. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4310 - Managerial Economics

The course adapts standard theory to more realistically discuss enterprise structure, firm and managerial behavioral incentives, and strategic behavior. Once a foundation is laid, successful and unsuccessful strategies and case studies are presented. Cross-listed with ECON 5310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4320 - Financial Economics

This course focuses on the economics of decision-making under conditions of risk and uncertainty. Topics include theories of efficient markets, rational expectations, speculative bubbles, random walks, portfolio analysis, options, derivatives and future markets. Emphasis is on the application of basic theories to economic agents' behavior and case studies. Prereq: ECON 2022, 3801 or Calculus II or Calculus III with a B or higher, and ECON 3811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4410 - International Trade

Trade theory identifies who wins and loses from trade and why there are usually overall gains. Explores issues in immigration, globalization, income inequality, tariffs, dumping, the WTO, the environment, wages, and growth

strategies among others. Prereq: ECON 3811. Cross-listed with ECON 5410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4420 - International Finance

The international adjustment process, including the foreign exchange market, balance of payments disequilibria, price and income adjustment, fiscal and monetary policy, and the international monetary system. Prereq: ECON 3811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4430 - Economic Growth

Explores causes of rapid growth or decline over long periods for different regions of the world. Inequality, sustainability, culture, climate, technology and resources all play significant roles. Data and examples are used to determine the important influences. Prereq: ECON 2022 and ECON 3811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4530 - Economics of Natural Resources

Examines economic models of renewable resource management and models of exhaustible resource depletion. Analyzes decisions made by private firms and governments affecting the methods and rate of resource development. Examines the effects of resource development on economic growth and environmental quality and the effects of economic development on resource scarcity. Prereq: ECON 2022. Cross-listed with ECON 5530. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4540 - Environmental Economics

Economic approach to environmental problems: relationship between ownership structures, externalities and environmental damage; poverty, population pressure, and environmental degradation; valuation of environmental amenities; sustainability of economic activity; cost-benefit analysis applied to the environment; evaluation of alternative instruments for environmental control. Prereq: ECON 2022. Cross-listed with ECON 5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4550 - Game Theory and Economic Applications

An introduction to economic applications of game theory. Concepts such as strategic and extensive form games, existence and selection of equilibrium will be covered. These concepts will be applied to understand market structure, location decisions, price competition, contracting, and auctions. Prereq: ECON 4071. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4610 - Labor Economics

Studies problems associated with the determination of wages, hours, and working conditions in the American economy. Strong emphasis placed on current research in such areas as welfare reform, minimum wage, return to schooling, immigration, labor market discrimination, and trade unions. Prereq: ECON 4811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4640 - Sports Economics

Applies economic analysis to sports. Explores topics such as competition, on-field performance, players' compensation, profits in professional sports, anti-trust and labor law, the impact of sports on local communities and the links between athletics and education. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4660 - Health Economics.

This course focuses on the analysis of current health care markets. Topics include the production of health, demand for health care, physician and hospital behavior, health insurance, medical malpractice, health externalities, managed care and the affordable care act. Prereq: ECON 3811 and 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4716 - Comparative Economic Systems

Critical examination of capitalism, socialism, communism and alternative systems. Focuses on the comparative study of various countries and the implementation and management of their economic systems. Prereq: ECON 2022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4740 - Industrial Organization

Examines the determinants of, and linkages between, market structure, firm conduct, and industrial performance. Topics include: determinants of the market size; impact of different market structures on prices and outputs; strategic behavior of firms to prevent entry or induce exit of rival firms; collusion; price discrimination; advertising; competition, monopoly, and innovation; implications for economic efficiency and public policy. Prereq: ECON 4071. Cross-listed with ECON 5740. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4770 - Economic Development--Theory and Problems

This course provides a theoretical and empirical framework for analyzing economic problems in developing countries focusing on the role of individuals, families and institutions. Topics include poverty traps, human capital accumulation, gender discrimination, microcredit and violent conflict. Prereq: ECON 4811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4811 - Introduction to Econometrics

Introduces econometric methods and their applications to quantitative economic problems. Simple and multiple regression models and problems encountered in their applications are developed in lectures and applied computer projects. Prereq: ECON 3811 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 4840 - Independent Study: ECON

Max hours: 12 Credits. **Semester Hours:** 1 to 3

ECON 4850 - Honors Independent Study: ECON

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ECON 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ECON 5030 - Data Analysis with SAS

Covers techniques for handling and interpreting economic data and conducting econometric analyses using SAS programming. Provides hands-on data management and analyses with large data sets with applications to business and economics, and prepare students for SAS Base Programmer certification exam. Prereq: ECON 3811 or equivalent. Cross-listed with ECON 4030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5050 - Special Economic Problems

Provides students the opportunity to critically evaluate some practical and theoretical problems under supervision, and to present results of their thinking to fellow students and instructors for critical evaluation. Prereq: Permission of instructor. Cross-listed with ECON 4050. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ECON 5051 - Data Analysis and Research Methodology

Consists of a series of lectures on the nature of conducting research, and discussions of the ways professional economists approach research problems. A review of spreadsheet applications and statistical packages are conducted. Prereq: ECON 4071 and 4811 or permission of instructor. Max hours: 1.5 Credits. **Semester Hours:** 2 to 2

ECON 5052 - Data Analysis and Research Methodology II

Develops student skills in data analysis and applications to economic issues and policy evaluation. Hands-on demonstration and student participation in empirical strategies using statistical packages in the social sciences (i.e. SAS). Emphasis on programming, research strategies and interpretation of results. Prereq: ECON 5051 or permission of instructor. Max hours: 1.5 Credits. **Semester Hours:** 2 to 2

ECON 5073 - Microeconomic Theory

Fundamental features of partial equilibrium theory of the firm, consumer and market. General equilibrium and welfare economic topics are examined. Features of the models that have empirical applications are accented. Coreq: ECON 5803. Restriction: Restricted to students with graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5083 - Macroeconomic Theory

Examines the major macroeconomic models within a common framework. Differences in the foundations, structure, and policy implications of the competing models are analyzed. Coreq: ECON 5803. Restriction: Restricted to students with graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5090 - History of Economic Thought

Traces the development of economic thought from ancient times to the 20th century. Considers the context in which these ideas were developed and their relationship to modern economic thought and contemporary economic problems. Prereq: ECON 2012 and ECON 2022. Cross-listed with ECON 4090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5150 - Economic Forecasting

Teaches forecasting techniques used in business and government to project trends and short-term fluctuations. Actual data are employed in instruction and labs. State-of-the-art spreadsheet and algorithms are introduced as part of the course work. Prereq: ECON 3811. Cross-listed with ECON 4150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5310 - Managerial Economics

The course adapts standard theory to more realistically discuss enterprise structure, firm and managerial behavioral incentives, and strategic behavior. Once a foundation is laid, successful and unsuccessful strategies and case studies are presented. Cross-listed with ECON 4310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5320 - Financial Economics

Studies the financial decision making process of individuals and business entities, and the workings of financial institutions. Topics include the essentials of optimal portfolio, financial management, financial innovations, and the globalization of financial markets. Emphasis is on the application of basic theories to economic agents' behavior and the case studies. Prereq: ECON 5073 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5410 - International Trade

Trade theory identifies who wins and loses from trade and why there are usually overall gains. Explores issues in immigration, globalization, income inequality, tariffs, dumping, the WTO, the environment, wages and growth strategies among others. Prereq: ECON 2022. Cross-listed with ECON 4410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5530 - Economics of Natural Resources

Examines economic models of renewable resource management and models of exhaustible resource depletion. Analyzes decisions made by private firms and governments affecting the methods and rate of resource development. Examines the effects of resource development on economic growth and environmental quality and the effects of economic development on resource scarcity. Prereq: ECON 5073. Cross-listed with ECON 4530. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5540 - Environmental Economics

Economic approach to environmental problems: relationship between ownership structures, externalities and environmental damage; poverty, population pressure, and environmental degradation; valuation of environmental amenities; sustainability of economic activity; cost-benefit analysis applied to the environment; evaluation of alternative instruments for environmental control. Prereq: ECON 5073. Cross-listed with ECON 4540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5660 - Health Economics

Introduces students to analytical skills and economic methods, and demonstrates how these methods can be applied to issues in health policy and management. Topics include: demand for health and medical care; health care costs, health reform, medical technology; market for health insurance; physicians, hospitals, and managed care; pharmaceuticals; regulations in the U.S. health care sector; demand for addictive substances; infant and maternal health; international comparisons of health care systems. Prereq: Permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5740 - Industrial Organization

Examines the determinants of, and linkages between, market structure, firm conduct, and industrial performance. Topics include: determinants of the market size; impact of different market structures on prices and outputs; strategic behavior of firms to prevent entry or induce exit of rival firms; collusion; price discrimination; advertising; competition, monopoly, and innovation; implications for economic efficiency and public policy. Prereq: Permission of instructor. Cross-listed with ECON 4740. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5800 - Special Topics

Current economics topics to be determined by the instructor. Prereq: ECON 3801 or MATH 1401. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ECON 5803 - Mathematical Economics

Introduces the use of mathematics in advanced micro- and macro-economic analysis. Emphasis on model-building techniques, solution methods, and economic interpretations. Restriction: Students must be admitted to the MA in ECON in order to enroll ECON 5803. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5813 - Econometrics I

Theory and application of statistical techniques used to analyze economic problems. Topics include simple and multiple regression models, simultaneous equation models, and the problems encountered in their application. Students formulate models, obtain data, estimate models, interpret results and, forecast. Coreq: ECON 5803. Restriction: Restricted to students with graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5823 - Econometrics II

Second course in the econometrics sequence, covering intermediate topics in cross-section and time series analysis. Topics include limited dependent variables, autoregressive and distributed lag models, longitudinal data analysis and unit roots, co-integration and other time-series topics. Students must complete ECON 5813 prior to taking ECON 5823. Prereq: ECON 5813. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 5840 - Independent Study

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ECON 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ECON 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

ECON 5950 - Master's Thesis

Max hours: 4 Credits. **Semester Hours:** 1 to 4

ECON 6010 - Advanced Microeconomic Theory

Recent and contemporary literature on fundamentals of economic theory. Consideration of value theory with particular emphasis on methodology, theory of demand, theory of the firm, and theory of distribution. Prereq: ECON 5073. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6020 - Advanced Macroeconomic Theory

Considers general equilibrium and aggregative analysis in economic theory, with particular emphasis given to the theory of employment, consumption and investment. Prereq: ECON 5083. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6053 - Seminar In Applied Economics

Familiarizes students with applied research in economics. Students read, discuss, and critique articles in economic journals. Emphasis is placed on research design and methods employed in these articles to prepare students for development of their own research projects in subsequent courses. Topics vary with instructor, and may include international economics, labor economics, monetary theory, public or finance and development economics. Prereq: ECON 5073 and ECON 5813 must be complete before students enroll in ECON 6053. Coreq: ECON 5823

(Students must enroll in both courses concurrently). Restriction: Restricted to students with graduate standing. Max hours: 6 Credits. **Semester Hours:** 2 to 2

ECON 6054 - Seminar In Applied Economics II

Familiarizes students with state-of-the-art applied economic research. Students read, discuss, and critique articles published in economic journals. Note: Topics vary with the instructor. Prereq: ECON 5073 and ECON 5813 must be complete before students can enroll. Coreq: ECON 5823 is a co-requisite with ECON 6054. Students must enroll in both courses concurrently. Restriction: Restricted to students with graduate standing. Max hours: 6 Credits. **Semester Hours:** 2 to 2

ECON 6060 - Special Topics

Special topics in advanced microeconomics. Consideration of value theory based upon methodology, theory of demand, and theory of distribution. Prereq: ECON 3801. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ECON 6073 - Research Seminar

Focuses on training students to do rigorous research in economics. Topics include the analysis of large data sets, further development of econometric skills, and writing a research paper. Note: Students attend lectures and also meet regularly with the instructor in the process of doing a sophisticated research project. ECON 5073 and ECON 5823 and either ECON 6053 or ECON 6054 must be complete before students can enroll in ECON 6073. Restriction: Restricted to students with graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6110 - Money and Central Banking

Monetary and financial institutions, with focus on relationships among domestic monetary policy, interactional credit and balance of payments. Prereq: ECON 5083. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6210 - Public Finance

Advanced economic theory applied to the problems of public and private sector decision making. Applied topics in taxation, education, voting theory, welfare economics, externalities and public goods. Prereq: ECON 5073. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6410 - International Trade

Contemporary and classical literature on theories of international trade. Topics include the determination of the pattern and terms of trade, the relationship between growth and trade, and commercial policy. Prereq: ECON 5073. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6420 - International Finance

Topics in international finance, including exchange rate determination, the adjustment process, international financial markets and the international monetary system. Prereq: ECON 5073. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6610 - Labor Economics

Advanced study of the labor market, including: history, nature, and function of labor organizations; the process of wage determination; and the formation of public policy. Prereq: ECON 5073 and 5813. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6770 - Economic Growth and Development

Considers the role of planning in economic development, with particular reference to investigation of planning problems, especially in less developed countries. Prereq: ECON 5073 and 5803. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6801 - Advanced Mathematical Economics

Addresses economic dynamics, formal mathematical modeling in economics, and optimization in economic theory. Prereq: ECON 5803 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6810 - Econometrics and Forecasting

Covers advanced topics in cross-sectional and time-series analysis. Emphasizes important theoretical and empirical issues encountered in applied work in economics and business. Topics include problems of structural change and model misspecification, instrumental variables, simultaneous equations models, distributed lags, maximum likelihood estimation, qualitative and limited dependent variables, Arima models, vector-autoregressions, issues on exogeneity and causality. Through the use of econometric software programs and actual data, students learn to execute estimation and forecasting projects soundly. Prereq: ECON 5813 and 5823. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ECON 6840 - Independent Study

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ECON 6950 - Master's Thesis

Max hours: 9 Credits. **Semester Hours:** 1 to 6

EDFN 1000 - Equality, Rights & Education

Examines the history of U.S. public schooling through landmark court cases. Investigates/analyzes how apartheid came to be institutionalized, how forces of desegregation achieved a series of momentous victories, and how those victories have been undermined through the resegregation of schools. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 1111 - Freshman Seminar

Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 3000 - Undocumented Mexican Immigration

The socio-legal construction of Mexican undocumented immigration from the early decades of the twentieth century to the current era is addressed. Social justice questions including access to higher education arising from the racialization of Latino/a immigrants are also examined. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 4000 - Food Justice in City & Schools

Food justice examines systemic inequities in access to healthy food. The history of school/community gardens, developments in urban agriculture and school/city policies are examined. The intersection of urban agriculture, hunger, and schooling/learning is examined in school gardens and school farmer's markets. Cross-listed with EDFN 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 4001 - Problematizing Whiteness: Educating for Racial Justice

Critical Whiteness Studies provides a deeper analysis of race that accounts for both sides of the race coin: the plight of people of color AND how Whites are complicit. This class looks deeper into how race operates within White contexts and how that impacts people of color so we bridge how Whites AND people of color can work together towards a racially equitable society. Cross listed with ETST 4010, HUMN 5010, SSCI 5010 and EDFN 5001. **Semester Hours:** 3 to 3

EDFN 4010 - Social Foundations and Cultural Diversity in Urban Education

This course focuses on the role of cultural diversity in the United States school system and what this means for educators oriented toward social justice. The intention of this course is to have teacher candidates engage in exploring the most salient issues surrounding education in the United States, developing an understanding of the complex relationships between schools and the larger society of which they are a part. This course closely examines important contemporary and historical societal issues such as race, social class, gender, ethnicity, sexual identity, politics, and dynamics of power and privilege. Cross-listed with EDFN 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5000 - Food Justice in City & Schools

Food justice examines systemic inequities in access to healthy food. The history of school/community gardens, developments in urban agriculture and school/city policies are examined. The intersection of urban agriculture, hunger, and schooling/learning is examined in school gardens and school farmer's markets. Cross-listed with EDFN 4000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5001 - Problematizing Whiteness: Educating for Racial Justice

Critical Whiteness Studies provides a deeper analysis of race that accounts for both sides of the race coin: the plight of people of color AND how Whites are complicit. This class looks deeper into how race operates within White contexts and how that impacts people of color so we bridge how Whites AND people of color can work together towards a racially equitable society. Cross listed with ETST 4010, HUMN 5010, SSCI 5010 and EDFN 4001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5010 - Sci Fndts, Cltrl Dvrsty Urb Ed

This course focuses on the role of cultural diversity in the United States school system and what this means for educators oriented toward social justice. The intention of this course is to have teacher candidates engage in exploring the most salient issues surrounding education in the United States, developing an understanding of the complex relationships between schools and the larger society of which they are a part. This course closely examines important contemporary and historical societal issues such as race, social class, gender, ethnicity, sexual identity, politics, and dynamics of power and privilege. Cross-listed with EDFN 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5050 - Critical Issues in American Education

Examines the social values and forces in American society which shape or influence the aims, philosophies, methods, content, and problems of the American educational enterprise. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5070 - Curriculum Theories in Urban Education

Topics in this course include: curriculum theory; the debate on the purpose of curriculum; multicultural education; critical race theory; social class and school improvement; the intended and unintended consequences of school accountability, reform and closures; teacher retention; and teacher burnout. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5240 - Culture of Education Policy

This course examines major issues in education policy analysis. Students will be required to critically analyze an educational policy issue uncovering the context, determining how the policy was implemented and what the outcomes were, intended as well as unintended. Course is cross-listed with EDFN 7240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 5700 - Global Education and 21st Century Learning

Explore challenges and opportunities of global citizenship. Articulate framework for 21st Century Learner. Examine influence of social and political movements, including colonization, on the development of communities and cultures. Explore connections and intersections of local and global issues and systems. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7240 - Culture of Education Policy

This course examines major issues in education policy analysis. Students will be required to critically analyze an

educational policy issue uncovering the context, determining how the policy was implemented and what the outcomes were, intended as well as unintended. Course is cross-listed with EDFN 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7250 - School and Society

Policies and educational reforms affecting the technical core of schooling: curriculum, teaching, learning, assessment, and organization. Students develop research and policy analysis skills and investigate social and political factors affecting what is taught and learned in schools. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7400 - Epistemologies: Ways Knowing, Res Paradigms, & Counter-Epistemologies

Epistemologies addresses conceptions and approaches to ways of knowing including intellectual traditions and their history as well as epistemological counter-stories of marginalized and subaltern ways of knowing that expose the contingency and bias of dominant forms of knowing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7410 - Power and Privilege: The Social Construction of Difference

This course will focus on understanding culture and diversity, recognizing the role of power and privilege in both individual and institutional interactions, and developing a philosophy of social justice and equity. Prereq: Doctoral Student Status. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7420 - Foundations of Education in Urban and Diverse Communities

This course focuses on the complex relationship between schools and the larger society of which they are a part. Emphasizing historical, political, and sociological perspectives, this course explores the interplay of social systems in education (economic, political, social, health, legal), analyze education policies, and the intended and unintended consequences of these processes. Prereq: Doctoral Student Status. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7430 - Working with Families and Communities

Designed for veteran and novice teachers and administrators to add to their present understanding of the function of families and communities in contemporary society. Participants examine key theoretical texts of important scholars in the field of human development, with an emphasis on topics such as the politics of everyday life, the salience of linguistic & cultural identity in the life of families/communities, and the political-economic and social factors that shape the "life course" of families/communities. Prereq: Doctoral Student Status. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDFN 7833 - Culture and Critical Theory

Provides an introduction to critical inquiry. General topics include: the development and of the concept of culture, the development and application of critical theory, critical race theory and critical pedagogy. Through the course, students are guided to explore critical theory work in their own field. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 1930 - Community Based Field Experience & Seminar

Students learn the dispositions of a community-grounded educator and develop an asset-based lens for working with students, families, & communities through 60 hours of required field experience and a mediated seminar. Prereq: Must have one semester successfully completed at UCD prior to enrollment unless a transfer student; must have completed CBI Background Check & Oath & Consent process prior to enrolling. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 2050 - Current Topics in Teaching, Learning & Development

Current topics that explore community and educational settings in Teaching, Learning and Development (TLED) to be selected by the instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 3

EDHD 2840 - Independent Study in Teaching, Learning & Development

Max hours: 6 Credits. **Semester Hours:** 1 to 3

EDHD 2910 - Service Learning in TLED

This course prepares our students to become responsible and resourceful citizens who partner with community organizations and work to serve a wide range of needs and issues within culturally and linguistically diverse environments. Max hours: 4 Credits. **Semester Hours:** 1 to 4

EDHD 2930 - Learning & Development Field Experience & Seminar

Teacher candidates engage in field experience 2, half-days per week in early childhood and primary classrooms working with children to support literacy learning while also observing, documenting and reflecting on how learning & development is facilitated. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 3930 - Diverse Learners Field Experience & Seminar

EDHD 3930 is a comprehensive clinical block field experience designed to support teacher candidates' learning of issues and practices relevant to students with disabilities and English language learners. A seminar will mediate teacher candidates' experiences from their various classroom settings. Max hours: 3 Credits. **Semester Hours:** 2 to 3

EDHD 4050 - Special Topics in Teaching, Learning & Development

Advanced study of special topics that examine community and educational settings in Teaching, Learning and Development (TLED) to be selected by the instructor. Maybe repeated for credit. Max hours: 6 Credits. **Semester Hours:** 1 to 3

EDHD 5110 - Human Learning

A review of the research on human learning, including related topics such as information processing and motivation. Various theories of learning are examined in-depth, and their applications to teaching and practices in schools (and in other educational settings) are considered. Cross-listed with HDFR 4110. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 5180 - Psychology of Gifted, Talented and Creative Children

Examines the nature of gifted, talented, and creative children from an educational psychology perspective. Topics addressed include historical antecedents, identification, characteristics of such children, research initiatives, measurement issues, relevant programs and teaching strategies. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 5200 - Social Psychology of Learning

An analysis of social-psychological concepts, such as self-concept, attitude development, person perception, group processes and related phenomena. Applications to education and other settings are considered. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 5240 - Cognition and Instruction

Explores recent developments in cognition and their implications for instructional practices. Includes theory and research in cognitive psychology and resultant educational practices. Cross listed with HDFR 4240. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 5260 - Child Study and Observation

Involves extensive, systematic observation of young children. Recorded observations are analyzed in terms of child development theories, children's background, setting variables, and are then presented in written and elaborated form. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 5840 - Independent Study

Max hours: 4 Credits. **Semester Hours:** 1 to 4

EDHD 5910 - Practicum in Education and Human Development

Field-based experiences in settings (schools, businesses, governmental agencies, special projects) that are linked closely to the student's professional objectives. Requires a minimum of 150, 225 or 300 clock hours under supervision (two-four credit hours, respectively). Prereq: Permission of instructor. Max hours: 8 Credits. **Semester Hours:** 2 to 4

EDHD 6100 - Advanced Child Growth and Development

Systematic study of the major theories of child growth and development. Focuses on current research regarding infants

and children and the implication of such research for education. Cross-listed with EDHD 7100. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6140 - Social Contexts of Adolescence and Schooling

Systematic study of the major theories of adolescent growth in social contexts, emphasizing the social and cultural construction of the adolescent experience. Focuses on current research regarding adolescents and the implications of the research for education. Cross-listed with EDHD 7140. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6200 - Human Development Over the Life Span

An inquiry into the experience and meaning of human development over the full span of life. Both analytical and reflective modes of exploration are utilized to approach the study of personhood and the courses and themes of life. Cross-listed with EDHD 7200. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6220 - Adult Development

Surveys theories and principles of adult development through an ecological perspective with an emphasis on community and educational contexts. Cross listed with EDHD 7220. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6230 - Mind, Brain, and Education

An introductory survey into contemporary theory and research in developmental cognitive neurosciences and their potential applications to education, aiming to explore how the brain learns, and what it means for learning and development. Prereq: EDHD 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 6250 - Advanced Abnormal Psychology

The major objective of this course is to help the student develop a professional level of understanding of the major disorders commonly subsumed under the term "psychopathology" and related treatments. Classification of disorders in the DSM IV is utilized. Cross-listed with COUN 6250. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6350 - Theories of Personality Development and Change

Advanced course in personality theory intended to assist students in becoming aware of their personal theory of personality and its implications for change. Students are introduced to an array of personality theories, taught to recognize the assumptions of each and their mechanism for change, and taught the implications of each for personal growth and therapy. Cross-listed with COUN 6350. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6600 - Motivation in Contexts

Theories of human motivation are examined through social and cultural lens directed at phenomena of engagement and disengagement in activities at different levels of scale. Applications are considered for both educators and learners in

various social and cultural learning contexts. Cross listed with EDHD 7600. Prereq: EDHD 5110 or instructor permission. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 6750 - Designing Environment for Learning and Development

Introduction to concepts, findings, and research methods relevant to theory and research in the Learning Sciences, with specific focus on how those concepts and findings apply to design learning across settings. Prereq: EDHD 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 6840 - Independent Study: EDHD

Max hours: 4 Credits. **Semester Hours:** 1 to 4

EDHD 6950 - Master's Thesis

Max hours: 4 Credits. **Semester Hours:** 4 to 4

EDHD 7100 - Advanced Child Growth and Development

Systematic study of the major theories of child growth and development. Focuses on current research regarding infants and children and the implication of such research for education. Cross listed with EDHD 6100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 7120 - Family Dynamics

Review and analysis of issues related to families with exceptional or at-risk young children. Topics include coping skills, family involvement, parent-child interaction, and sources of support. Special attention is given to current research and its application to early intervention. Cross-listed with HDFS 6120. Max hours: 6 Credits. **Semester Hours:** 3 to 3

EDHD 7140 - Social Contexts of Adolescence and Schooling

Systematic study of the major theories of adolescent growth in social contexts, emphasizing the social and cultural construction of the adolescent experience. Focuses on current research regarding adolescents and the implications of the research for education. Cross-listed with EDHD 6140. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 7200 - Human Development Over the Life Span

An inquiry into the experience and meaning of human development over the full span of life. Both analytical and reflective modes of exploration are utilized to approach the study of personhood and the courses and themes of life. Cross-listed with EDHD 6200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 7220 - Adult Development

Surveys theories and principles of adult development through an ecological perspective with an emphasis on community and educational contexts. Cross-listed with EDHD 6220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 7600 - Motivation in Contexts

Theories of human motivation are examined through social and cultural lens directed at phenomena of engagement and disengagement in activities at different levels of scale. Applications are considered for both educators and learners in various social and cultural learning contexts. Cross-listed with EDHD 6600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDHD 7712 - Learning and Human Development

Students apply major issues from learning and human development theories to problems of practice and research related to education and community contexts. Prereq: EDHD 5110 or 5220 or (recommended: EDHD 5100 or 5140). Restriction: Restricted to EDHD-PhD, LDRE-EDd, EDLI-PhD and SPSY-PsyD majors within the School of Education and Human Development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDLI 8994 - Doctoral Dissertation PhD

Max hours: 40 Credits. **Semester Hours:** 1 to 10

EDUC 5000 - Special Topics: Administrative Leadership and Policy Studies

Specific topics vary. Focus is on faculty-developed options to standard course offerings to facilitate program development and distance-learning activities. Max hours: 40 Credits. **Semester Hours:** 0 to 10

EDUC 5001 - Special Topics: Administrative Leadership and Policy Studies

Max hours: 40 Credits. **Semester Hours:** 1 to 10

EDUC 5010 - Paraeducator Supervision Academy

Provides the paraeducator with knowledge and skills to work effectively in teams. Paraeducators refine their knowledge of the characteristics of paraprofessionals in education, the distinction between professional and paraprofessional roles and responsibilities, liability and ethical issues. Max hours: 1 Credit. **Semester Hours:** 1 to 1

EDUC 5015 - Developmental Intervention Supervisor Academy (DISA)

Developmental Intervention Supervisor Academy provides early intervention professionals with the knowledge and skills to work effectively in teams and to utilize and supervise Developmental Intervention Assistants (DI Assistant is the title used in Colorado for paraprofessionals in early intervention services). Max hours: 1 Credit. **Semester Hours:** 1 to 1

EDUC 5020 - Trainers of Paraeducator Academy

Provides the professional educator with the skills to provide effective presentations to paraprofessionals in schools. Max hours: 1 Credit. **Semester Hours:** 1 to 1

EDUC 5025 - Developmental Intervention Trainers Academy (DITA)

Developmental Intervention Trainer Academy (DITA) is offered to early interventional professionals who have completed EDUC 5015 (DISA). DITA provides the participants skills to become effective trainers who deliver training to Developmental Intervention Assistants (i.e. paraprofessionals in early intervention services in Colorado). Prereq: EDUC 5015. Max hours: 1 Credit. **Semester Hours:** 1 to 1

EDUC 5030 - Top Cadre of Trainers (TOPCAT) Seminar

Provides CO-TOP Trainers (school professionals who have been through the PSA: EDUC 5010 and TOPA: EDUC 5020) ongoing support in their roles as supervisors and trainers of paraeducators. Through this seminar trainers receive updated information about CO-TOP Academies, find collegial support from other trainers, exchange ideas, gain presenting and adult teaching ideas, and receive feedback on their teaching of paraeducator academies. This seminar also addresses the questions and needs of the individual CO-TOP trainer with regard to CO-TOP paraeducator training materials and processes. Prereq: EDUC 5010 and 5020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 5040 - Mentoring Novice and Pre-Service Teachers

Designed to help participants develop or enhance the skills necessary to successfully work with candidates who are completing teacher education programs. Concentrates on supervision and conference skills, adult learning theory, and communication skills. Max hours: 1 Credit. **Semester Hours:** 1 to 1

EDUC 5651 - Foundations of Leadership

This course focuses on leadership and the characteristics and foundational elements of what the leaders need to think about and do while providing the opportunity for students to apply this foundational learning to leadership in their own organization. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 5652 - Leadership for Equity/Social Justice

Understand our own experiences and experiences of historically marginalized groups, with the historical and philosophical forces that have led to inequities, critically analyze current conditions and to work to develop school policies, curriculum and relationships to create access and opportunities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 5653 - Leadership Practices for Responsive Change

This course focuses on leadership and the change process of individual and organizational responsive change with

opportunity for students to learn about/apply this learning to the process of leading responsive change in the context of an organization. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 5654 - Leadership Practice Capstone

The Capstone Experience is a culminating project that provides a way for students to demonstrate the knowledge and skills they acquired during the MA program, linked to issues of equity or social interest related to the United States educational system. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 5751 - Principal/Administrator Licensing I

This program section (1 of 4) combines foundational learning in leadership, school improvement, instructional leadership and equity via hybrid sessions. Clinical-practice experiences are required. Assessment is performance-based and submitted to LIVETEXT. Prereq.: admission to the program. Max hours: 9 Credits. **Semester Hours:** 3 to 9

EDUC 5752 - Principal Administrator Licensing II

This program section (2 of 4) combines continued learning in leadership, school improvement, instructional leadership and equity via hybrid sessions. Clinical-practice experiences are required. Assessment is performance-based and submitted to LIVETEXT. Prereq.: admission to the program. Max hours: 9 Credits. **Semester Hours:** 3 to 9

EDUC 5753 - Principal/Administrator Licensing III

This program section (3 of 4) combines Continued learning in leadership, school improvement, instructional leadership and equity via hybrid sessions. Clinical-practice experiences are required. Assessment is performance-based and submitted to LIVETEXT. Prereq.: admission to the program. Max hours: 9 Credits. **Semester Hours:** 3 to 9

EDUC 5754 - Principal or Administrator Licensing IV

This program section (4 of 4) combines foundational learning in leadership, school improvement, instructional leadership and equity via hybrid sessions. Clinical-practice experiences are required. Assessment is performance-based and submitted to LIVETEXT. Prereq.: admission to the program. Max hours: 9 Credits. **Semester Hours:** 3 to 9

EDUC 5836 - Workshop: Educational Administration, Curriculum and Supervision

Max hours: 15 Credits. **Semester Hours:** 1 to 4

EDUC 5840 - Independent Study: EDUC

Master's. Max hours: 9 Credits. **Semester Hours:** 1 to 4

EDUC 5950 - Master's Thesis

Max hours: 16 Credits. **Semester Hours:** 1 to 8

EDUC 6000 - Special Topics: Administrative Leadership and Policy Studies

Specific topics vary; focus is on faculty-developed options to standard course offerings to facilitate program development and distance-learning activities. Max hours: 40 Credits. **Semester Hours:** 1 to 10

EDUC 6840 - Independent Study

Max hours: 4 Credits. **Semester Hours:** 1 to 4

EDUC 6951 - Master's Thesis

Max hours: 16 Credits. **Semester Hours:** 4 to 4

EDUC 7100 - Leadership in Education

Orients students to broad periods of administrative science, philosophical and behavioral underpinnings of various models and types of leadership, and develops doctoral-level analysis and writing skills to articulate self-knowledge as leader and the application of appropriate leadership practices in context. Prereq: admission to the doctoral program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 7230 - Organizational Performance In Educational Contexts

Explores connections between organizational behaviors and outcomes as well as external and internal factors influencing organizational behavior. The course focuses on how education organizations learn, how they can use that learning to improve performance, and what techniques are available to help understand present performance and affect future performance. Prereq: permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 6

EDUC 7500 - Strategic Human Capital Development

This course focuses on understanding and leveraging the personnel function of an educational organization. You will learn how to strategically align and maximize your human capital with organizational strategic objectives. Cross-listed with DSEP 7500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 7510 - Strategic Organizational Management

An effective partnership between the board, community and institutional leader is essential to fulfilling the mission of an educational organization. This course examines the importance of strategic visioning, strategic planning, and specific communication strategies. Cross-listed with DSEP 7510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 7520 - Strategic System Improvement

The fundamental purpose of educational organizations (schools, districts, community colleges, higher education, non-profits) is to ensure high levels of learning for all. This course addresses topics such as data development and management, accountability, curriculum assessment and instruction, continuous improvement, and professional learning. Cross-listed with DSEP 7520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 7530 - Strategic Leadership Development

Successful leaders are able to articulate, protect and promote what is important. This course will examine the challenges of educational leadership and help participants clarify the core values essential to their success as a leader. Max hours: 3 Credits. **Semester Hours:** 3 to 3

EDUC 7840 - Independent Study: EDUC

Doctoral. Max hours: 12 Credits. **Semester Hours:** 1 to 4

ELEC 1201 - Introduction to Electrical Engineering

Introduces the field of electrical engineering and the computer -- its primary tool. ELEC faculty members explain the various specialties within the field by demonstration. Word processors, spreadsheets, and engineering software are introduced. Note: This course is not available to students who have taken ELEC 2142. ENGR 1000 cannot be substituted for ELEC 1201. Prereq: High School Trigonometry. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 1510 - Logic Design

The design of combinatorial and sequential switching circuits. Topics include Boolean algebra, Boolean function minimization technique, combinatorial circuit analysis and synthesis, synchronous sequential circuit analysis and synthesis, algorithmic state machine design, asynchronous sequential circuit analysis and synthesis. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 1520 - Embedded Systems Engineering I

This course serves as an introduction to the "C" programming language for electrical and computer engineers. Programming concepts are introduced from a hardware design standpoint specifically covering micro-controller and embedded systems design issues. Programming for engineering applications are studied. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 2132 - Circuit Analysis I

Introduces circuit analysis: basic principles, operational amplifier circuits, first-order and second-order circuits, steady-state sinusoidal analysis with phasor mathematics. Prereq: MATH 2411 and PHYS 2311. Cross-listed with CSCI 2132. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ELEC 2142 - Circuit Analysis II

Sequential course after ELEC 2132. Topics include: Solution of circuits using Laplace transforms, frequency domain analysis, additional steady-state solutions, Bode plots, active filters, pulses, impluses, and computer-aided analysis. Prereq: ELEC 2132, MATH 2421, PHYS 2331. This course can be taken stand alone without a lab. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 2520 - Embedded Systems Engineering 2

A second semester computer engineering course covering basic computer architecture including CPU's, memory, peripherals, and operating systems including development tools, Kernel selection, file systems, and storage device manipulation, boot loaders, USB, networking, device drivers, and real-time operating system usage. Prereq: ELEC 1520. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ELEC 2531 - Logic Laboratory

Experiments in digital logic utilizing both computer simulation and actual analysis using integrated circuits. Initially, combinational logic circuits are studied, including circuits such as binary adders and multipliers, followed by sequential circuits, including counters. Meters and oscilloscopes are introduced. Use of computer-aided design tools facilitating design, simulation, and implementation of digital systems using field-programmable logic devices are an integral part of the entire course. Prereq/Coreq: ELEC 1510. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 2552 - Sophomore Circuits Laboratory

Conduct experiments in circuit measurement using oscilloscopes, power supplies, and function generators. Verify basic circuitry, basic circuit theorems such as Ohm's Law, Kirchoff's Law, and Thevenin's theorem and Norton's theorem. Learn by experiments: impedance functions, transfer functions, resonance, Fourier series and analog filters. Prereq/coreq: ELEC 2142. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 3030 - Electric Circuits and Systems

This basic electrical engineering course is for non-majors (does not apply to BSEE degree). Students study circuit analysis, transformers, electric motors, and simple electronic circuits (diodes and transistors). Prereq: MATH 2421 and PHYS 2331. Cross-listed with MECH 3030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3133 - Electromagnetic Fields

Fundamental physics and applications of electric and magnetic fields are covered. Topics include: vector analysis in multiple coordinate systems, Maxwell's equations in free space and material regions including boundary conditions, static and quasi-static electric and magnetic fields, uniform plane waves for free space and for materials. Prereq: ELEC 2132, MATH 3195, 2421 and PHYS 2331. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3164 - Energy Conversion

Theory of transformers. Energy conversion concepts. Basic rotating energy converters, including direct current,

synchronous and induction machines and applications. Prereq: ELEC 2142. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3215 - Electronics I

The learning objective is fundamental semiconductor theory as applied to electronic circuits. Topics include: semiconductor theory, P-N junctions and diode applications, power supply design, transistor (BJT) theory and applications, low-frequency amplifiers, FET and MOSFET devices. Prereq: ELEC 2132, PHYS 2331 and CHEM 1130. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3225 - Electronics II

BJT and FET transistor models at high frequencies, multistage amplifiers, frequency response of amplifiers. Feedback, operational amplifiers, oscillators, power amplifiers, and introduction to power electronics. Prereq: ELEC 2142 and 3215. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3316 - Linear Systems Theory

Introduces the fundamentals of signals and systems analysis. Topics include: time domain analysis of continuous and discrete time systems, frequency domain (Laplace and z-transform) analysis, applications to filters and feedback systems, Fourier transform for both continuous and discrete time signals, sampling and signal reconstruction, applications to communication systems and state space representation. Learning experience is enhanced by using MATLAB-based examples and experiments. Prereq: ELEC 2142. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3651 - Digital Hardware Design

The specification and design of large digital hardware systems. Applications include using a hardware description language and simple digital control circuits. Prereq: ELEC 2531 and ELEC 2520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3715 - Electronics Laboratory

Design and experimental verification of the operation of filter circuits, power supply circuits, transistor amplifier circuits and FET circuits. Prereq: ELEC 2552. Prereq/Coreq: ELEC 3215 Max hours: 3 Credits. **Semester Hours:** 1 to 1

ELEC 3724 - Energy Conversion Laboratory

Basic electro-mechanical energy conversion concepts as applied to the synchronous machine, induction machine, and DC machine; the transformer; applications. Prereq: ELEC 2142. Prereq or Coreq: ELEC 3164. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 3735 - Junior Laboratory

Design and measure: several nonlinear op-amp circuits, a multi-stage amplifier, and a complementary-symmetry output stage. Oral presentations on experiments to be given. Prereq: ELEC 3715. Prereq/Coreq: ELEC 3225. Max hours: 3 Credits. **Semester Hours:** 1 to 1

ELEC 3817 - Engineering Probability and Statistics

Topics include: definition of probability, conditional probability, independence, combined experiments and Bernoulli trials, random variables, joint distribution and density functions, correlations, sample mean and variance. Also, introduction to random processes, auto and cross correlation functions, spectral density of random signals, responses of a linear system to random inputs. Prereq: MATH 3195 and 2421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 3939 - Internship

Students gain engineering design experience involving application of specific technical concepts and skills in a supervised industrial environment. (Must have approval from ELEC faculty.) Prereq: ELEC 2142. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 4005 - IC Design

Explores digital integrated circuit design including MOS processing steps, physical operation, building blocks of digital circuits, advanced nMOS, pMOS and CMOS circuit design, silicon VLSI technology and circuit and chip level. Spice and lay-out Editor are used. The physical relationship between circuit design and actual silicon layout and structure and technology are emphasized. Prereq: Graduate standing or permission of instructor. Prereq: ELEC 3225. Cross-listed with ELEC 5005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4025 - Device Electronics

A course relating performance and limitations of solid state devices to their structures and technology. For both advanced circuit and device engineers. Semiconductor physics and technology, pn-junction and MOS devices used in modern integrated circuits. Prereq: ELEC 3225 and senior standing. Cross-listed with ELEC 5025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4133 - Advanced Electromagnetic Fields

A course focused on electromagnetic waves. Topics include: electromagnetic power, reflection and transmission of uniform plane waves in layered media, rectangular wave guides, two-conductor transmission lines, Smith Chart representation of wave impedance and reflection. Prereq: ELEC 3133. Cross-listed with ELEC 5033. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4134 - Introduction to Microwave Circuit Design

This course provides the basic principles of microwave circuit design, including transmission line theory, network parameters, signal flow graphs, design of high frequency matching networks, filters, hybrids and couplers using

waveguide elements, high frequency amplifier and mixer design. Prereq: ELEC 3133. Cross-listed with ELEC 5134. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4136 - Control Systems Analysis

Introduces students to the fundamentals of analysis and design of feedback systems. Topics include: mathematical models of linear continuous-time systems applied to modeling physical systems in the time and frequency domain, control system characteristics, Routh's stability and transient response analysis, Nyquist stability and polar plots, analysis and design of linear control systems by root locus and frequency response, methods, compensator implementation, finite-precision numerical effects, round-off errors, and computer-based design applications. Prereq: ELEC 3316. Coreq: ELEC 3817. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4164 - Electric Drive Systems

Covers power electronics drives for rotating electric machinery. Topics include power electronics elements for drives, load characteristics, dynamic modeling of AC machines, fundamental control algorithms, simulation and practical commercial drives. Prereq: ELEC 3164. Cross-listed with ELEC 5164. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ELEC 4170 - Electric Drive Systems Laboratory

Offers hands-on experience on rotating electric machine drive simulations and commercial systems. Sessions include pulse-width modulation (PWM) inverter, induction, DC, and synchronous machine drives. Matlab/Simulink and a commercial inverter will be utilized. Cross-listed with ELEC 5170. Prereq or Co-req: ELEC 4164/5164 or equivalent. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4174 - Power Electronic Systems

Topics to be covered include: power electronics fundamentals and applications in power systems; uncontrolled, semi-controlled and fully controlled power semiconductors; converters design and control. Prereq: ELEC 3164. Cross-listed with ELEC 5174. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4184 - Power Systems Analysis

Topics to be covered include: complex power; per-unit quantities; modeling of generators, transformers and transmission lines; power flow problem; economic dispatch; faults and sequence networks; and an introduction to power system protection and dynamics. Prereq: ELEC 3164. Cross-listed with ELEC 5184. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4225 - Advanced Electronics

Switching state models of discrete components and integrated circuits, including logic gates, comparators, and operational amplifiers. Input, output, and transfer characteristics. Non-ideal properties. Analog-digital and digital-analog conversion. MOS-integrated circuits. Prereq: ELEC 3215, 3225. Restriction: Restricted to students within the College of Engineering and Applied Science. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4247 - Communication Theory

Introduces the principles of analog and digital communication systems. Series expansion and Fourier Series and transforms. The sampling theorem. Stochastic principles and noise. Linear systems and Fourier analysis. Design of transmitters and receivers: modulation and demodulation schemes. Some information theoretic concepts: source coding, channel coding, channel capacity and performance measures. Prereq: ELEC 3316 and 3817. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4248 - Digital Communication Systems

Introduces digital communication systems covering elements of information theory; mathematical representation of signals and systems; modulation and demodulation for the additive Gaussian noise channel; performance analysis of various transmission formats; synchronization; coded waveforms; decoding algorithms; and other related topics. Prereq: ELEC 3316, 3817; recommended ELEC 4247. Cross-listed with ELEC 5248. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4249 - Space Communications Systems

Presents the art of space communications system design around the framework of the link budget and the essential analysis tool of the radio system designer. The budget is examined from theoretical and practical viewpoints. Pointers and motivation for further study in each of the related engineering disciplines are provided. Topics to be examined include satellite orbits, propagation, antennas, noise, modulation, coding and hardware or software. Prereq: Permission of instructor. Cross-listed with ELEC 5249. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4276 - Digital Control Systems

Topics to be covered include: discrete-time systems and the z-transform, characteristics of open-loop and closed-loop discrete-time systems, time-response characteristics and stability analysis, design of digital and hybrid control systems using z-transform, root locus, frequency domain, and state variable compensation techniques, compensator on, implementation, and computer-based design applications. Prereq: ELEC 3316 and ELEC 3817. Cross-listed with ELEC 5276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4309 - Senior Design Project I

Design methodology and tools, project planning and team building, ethics in engineering and research, career planning and portfolio building. Project designs are completed and presented to the class. Prereq: Students must complete their Senior/30 hour check prior to enrollment. Prereq/Coreq: All required ELEC 3000-level classes and labs. ELEC 4309 and ELEC 4319 must be completed in subsequent academic semesters. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4319 - Senior Design Project II

Project designs completed in ELEC 4309 are constructed and tested. Oral and written presentations of the completed project performance are required. Prereq: ELEC 4309 in subsequent academic semester. Students must complete their Graduation Agreement prior to enrollment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4333 - Introduction to Computational Electromagnetics

An intro to computational electromagnetics based on the Finite Difference Time-Domain (FDTD) covering, finite difference methods, the Yee algorithm, numerical error, stability, boundary conditions, source excitations, hands-on programming experience and application of FDTD to real problems. Prereq: ELEC 3133. Cross-listed with ELEC 5333. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4373 - Optical Engineering

This course introduces some of the most important concepts in optical engineering and prepares students a solid foundation to apply them to applications in the industry and academic research. Prereq: ELEC 3133 Electromagnetic Fields. Cross-listed with ELEC 5373. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4375 - Engineering Neuroscience

In this course, mathematical models and data processing strategies will be introduced as well as other cutting-edge research techniques to help students understand how these techniques can be applied to solve modern neuroscience problems. Prereq: ELEC 3316 or graduate standing. Cross-listed with ELEC 5735 and NRSC 7674 (Anschutz Medical Campus course). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4406 - Control Systems Laboratory

This lab includes system identification, design of velocity control systems, design of PID controllers and control systems using state variable feedback. Coreq: ELEC 4136. Cross-listed with ELEC 5276. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4423 - Radio Frequency Laboratory

Projects involve modern RF analyzers, wave-guide devices, time-domain techniques, characterization of filters/amplifiers, signal propagation and scattering, harmonic mixing, and radio frequency identification. Students will gain experience using MATLAB for data acquisition and processing. Prereq: ELEC 3133, 3225 and 3735. Cross-listed with ELEC 5423. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4435 - Advanced Electronics Laboratory

Projects related to digital logic, analog and digital switches, A/D and D/A converters, and design of signal filters. Prereq: ELEC 3225 and 3735; Prereq or Coreq: ELEC 4225. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4444 - Power Systems Laboratory

This lab introduces the student to modern computational tools used in power system analysis. Algorithms to solve the "power flow problem," the "economic dispatch problem," and the "optimal power flow problem" are discussed and

implemented in the Matlab-Simulink mathematical analysis software package. Prereq: ELEC 4184. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4466 - Adaptive Control System Design

Basic concepts in adaptive feedback control. Overview of application areas. Stability of non-linear systems and hyperstability approach to the design of adaptive controllers. Passivity concept and Liapunov stability. Design of model reference adaptive systems, self-tuning regulators, stochastic adaptive, and dual control systems. Computer-based design applications. Emphasis is placed on design projects. Prereq: ELEC 4136 or 4276. Cross-listed with ELEC 5466. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4467 - Communications Laboratory

Analysis and design in three main areas: traditional analog communications at low and medium frequencies, digital communications, and microwave communications systems. Extensive use of spectrum analysis from low frequencies up to microwave range. Projects include noise, AM, FM, PM, PLL, sampling, quantizing, encoding, TDM, FSK, QPSK, 16QAM, receivers, and satellite communications systems. Prereq: ELEC 3735; Prereq or Coreq: ELEC 4247 or ELEC 4248. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4474 - Power Electronics Laboratory

The power electronics laboratory introduces students to seven fundamental switchmode power conversion topologies, along with voltage and current feedback control, assembled on a reconfigurable power pole circuit board with external power supplies and laboratory. Coreq: ELEC 4174. Cross-listed with ELEC 5474. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4501 - Microprocessor Based Design

Covers advanced treatment of embedded system design using microprocessors. Analog input circuitry is interfaced to a microprocessor, and a PC board layout is created to develop a complete system design. Software/Operating System is implemented for realtime I/O. Prereq/Coreq: ELEC 3651. Cross-listed with ELEC 5501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4511 - Hardware-Software Interface

Computer engineering methods in hardware and software design applied to problems drawn from the mini- and micro-computer systems field. Hardware and software techniques for the design of combined hardware or software are developed. Interface and real-time programming techniques are considered. Graduate level requires additional projects and homework. Prereq: ELEC 3651. Cross-listed with ELEC 5511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4521 - Microprocessor Laboratory

Provides support for the projects assigned in ELEC 4501 - a complete embedded system is designed, built and tested. Coreq: ELEC 4501. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4555 - VLSI Circuit Simulation

Computer methods for large integrated circuits. Theory and practice of VLSI circuit simulation. Nodal formulations of networks. Computer generation of sensitivities. Modeling active devices. DC solution of nonlinear networks. Prereq: ELEC 3225. Cross-listed with ELEC 5555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4561 - Hardware-Software Lab

Projects related to the software interface of a processor to external devices. Topics include A/D converters, serial and parallel interfaces. Coreq: ELEC 4511. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 4637 - Digital Signal Processing

Discrete-time signals and systems in the time and frequency domain. Digital filter structures, design of FIR filters by windowing, optimum approximations of FIR filters. Design of digital IIR filters from continuous time domain. Computer-aided design of digital filters. The discrete Fourier transform and DSP algorithm implementation. Analysis of finite word length effects. Application of digital signal processing. Prereq: ELEC 3316 and 3817. Cross-listed with ELEC 5637. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4644 - Introduction to Biomedical Imaging

An important component of the recent expansion in biomedical engineering is the area of biomedical imaging. This ELEC 4644/5644 course is an introduction to biomedical imaging systems, not only covering the fundamentals of imaging physics but also the applications of four primary biomedical imaging modalities: X-Ray Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Nuclear Medicine (i.e. PET, SPECT), and Ultrasound Imaging. Prereq: ELEC 3316. Cross-listed with ELEC 5644. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4678 - Quantum Electronics

The course teaches students to understand the basic concepts of quantum mechanics and to learn the mathematical tools needed and to be familiar with some of the technical knowledge that applies quantum mechanics to various advanced problems in engineering. Prereq: PHYS 2331 and MATH 3195. Cross-listed with ELEC 5678. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4688 - Introduction to Nondestructive Testing

A basic, broad understanding of the principles of nondestructive testing and evaluation is provided. The main objective of this course is to attract students to NDT fields and eventually help address the increasing needs of NDT engineers and technicians. Interaction and collaboration with local NDT industries will also be emphasized. As an introductory course, a broad interdisciplinary knowledge of NDT will be covered in the following sub-areas: Visual, Penetrant, Magnetic Particle, Eddy Current, Microwave, Ultrasonic, and Radiography. Prereq: ELEC 1201 and ELEC 3316. Cross-listed with ELEC 5688. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4723 - High Performance Computer Architecture

High Performance Computer Architecture covers the design of advanced computing systems. In particular, the course includes the design of modern microprocessors, characteristics of the memory hierarchy, and issues involved in multithreading and multicore architectures. Prereq: ELEC 3651 Digital Hardware Design. Cross-listed with ELEC 5723. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4727 - Computer Vision & Image Processing Acceleration

Real-time constraints on computer-vision and image processing applications have motivated numerous explorations of multicore architectures to provide more efficiency through hardware parallelism and acceleration. This course undertakes the study of image processing and computer vision algorithms in the context of parallel hardware. Cross-listed with ELEC 5727. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 4755 - Renewable Energy Systems

This course focuses on the modeling, analysis and control of grid-connected wind and photovoltaic energy systems. Prereq: ELEC 3164. Cross-listed with ELEC 5755. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ELEC 4800 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 4840 - Independent Study: ELEC

An opportunity for independent creative work. Prereq: Permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 5005 - IC Design

Explores digital integrated circuit design including MOS processing steps, physical operation, building blocks of digital circuits, advanced nMOS, pMOS and CMOS circuit design, silicon VLSI technology and circuit and chip level. Spice and lay-out Editor are used. The physical relationship between circuit design and actual silicon layout and structure and technology are emphasized. Prereq: Graduate standing or permission of instructor. Cross-listed with ELEC 4005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5025 - Device Electronics

A course relating performance and limitations of solid state devices to their structures and technology. For both advanced circuit and device engineers. Semiconductor physics and technology, pn-junction and MOS devices used in modern integrated circuits. Prereq: ELEC 3225 and senior standing. Cross-listed with ELEC 4025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5033 - Advanced Electromagnetic Fields

A course focused on electromagnetic waves. Topics include: Poynting's power theorem, reflection and transmission of uniform plane waves in layered media, two-conductor transmission lines, rectangular wave guides, Smith Chart elements of radiation and antenna. Prereq: ELEC 3133 and permission of instructor for undergraduates. Cross-listed with ELEC 4133. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5133 - Electromagnetic Radiation and Antenna

Solution of inhomogeneous wave equation. Radiation fields of elementary dipole, linear wire antenna, uniform and non-uniform linear arrays. Array synthesis. Farzone field patterns, directivity and beamwidth. Diffraction fields of aperture sources, horn antenna, conic surface reflector sources, lens antenna. Ray tracing methods. Transient-receive link. Selected Topics. Prereq: ELEC 4133, graduate standing and permission of instructor for undergraduates. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5134 - Introduction to Microwave Circuit Design

This course provides the basic principles of microwave circuit design, including transmission line theory, network parameters, signal flow graphs, design of high frequency matching networks, filters, hybrids and couplers using waveguide elements, high frequency amplifier and mixer design. Prereq: ELEC 3133. Cross-listed with ELEC 4134. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5164 - Electric Drive Systems

Covers power electronics drives for rotating electric machinery. Topics include power electronics elements for drives, load characteristics, dynamic modeling of AC machines, fundamental control algorithms, simulation and practical commercial drives. Prereq: ELEC 3164. Cross-listed with ELEC 4164. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ELEC 5170 - Electric Drives Systems Laboratory

Offers hands-on experience on rotating electric machine drive simulations and commercial systems. Sessions include pulse-width modulation (PWM) inverter, induction, DC, and synchronous machine drives. Matlab/Simulink and a commercial inverter will be utilized. Cross-listed with ELEC 4170. Prereq: ELEC 4164 or equivalent. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 5174 - Power Electronic Systems

Topics to be covered include: power electronics fundamentals and applications in power systems; uncontrolled, semi-controlled and fully controlled power semiconductors; converters design and control. Prereq: ELEC 3164 and graduate standing or permission of instructor. Cross-listed with ELEC 4174. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5184 - Power Systems Analysis

Topics to be covered include: complex power; per-unit quantities; modeling of generators, transformers and transmission lines; power flow problem; economic dispatch; faults and sequence networks; and an introduction to

power system protection and dynamics. Prereq: ELEC 3164 and graduate standing or permission of instructor. Cross-listed with ELEC 4184. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5194 - Power Systems Operation and Control

This course introduces the student to various operational strategies the power industry uses today to operate the power system. Topics to be covered include: economic dispatch, unit commitment, optimal power flow (linear and nonlinear), transmission congestion, control areas, state estimation, and an introduction to power markets. Prereq: ELEC 4184 or ELEC 5184 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5210 - Optimization Methods in Engineering

Unconstrained optimization, gradient methods, conjugate direction methods, data fitting and function estimation. Applications in control, system identification and radar systems. Optimization over a convex set, LMS algorithms in adaptive systems, convergence properties. Nonlinear programming, Lagrange multipliers, projection algorithms, games and minimax theorem, application to H infinity control, communication and signal processing. Prereq: MATH 3191 and 3200/3195. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5220 - Methods of Engineering Analysis

Real sequences and infinite series, convergence of the parameter estimates in self-tuning control. Uniform convergence and application to adaptive FIR filters. Improper integrals, application in filtering, prediction and communication. Analytic functions, Hardy spaces, maximum modulus theorem. Argument principle and Nyquist stability criteria. Calculus of residues, LQG problem. Conformal mappings, Nevelinna-Pick problem. Prereq: MATH 3191 and 3200/3195, graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5230 - Advanced Linear Systems

Mathematical description of both continuous and discrete-time systems; vector, normed and inner-product spaces; state-space, impulse response and transfer function descriptions; state-transition response matrices; eigenvalues and eigenfunctions; controllability; canonical form; state feedback; observers; realization theory. Prereq: MATH 3191, MATH 3200/3195 and permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5248 - Digital Communication Systems

Introduces digital communication systems covering elements of information theory; mathematical representation of signals and systems; modulation and demodulation for the additive Gaussian noise channel; Performance analysis of various transmission formats; synchronization; coded waveforms; decoding algorithms; and other related topics. Prereq: ELEC 3316, 3817; recommended ELEC 4247. Cross-listed with ELEC 4248. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5249 - Space Communications Systems

Presents the art of space communications system design around the framework of the link budget and the essential analysis tool of the radio system designer. The budget is examined from theoretical and practical viewpoints. Pointers

and motivation for further study in each of the related engineering disciplines are provided. Topics to be examined include satellite orbits, propagation, antennas, noise, modulation, coding and hardware or software. Prereq: Permission of instructor and graduate standing. Cross-listed with ELEC 4249. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5250 - Information Theory

Introduces information theory and its application in computer science, communication theory, coding and applied mathematics. Entropy, mutual information, data compression and storage, channel capacity, rate distortion, hypothesis testing. Error detecting and correcting codes, block codes and sequential codes. Prereq: ELEC 3817 or CSCI 4535 or MATH 3800. Cross-listed with CSCI 5217. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5252 - Computer Communication Networks

Comprehensive study of issues arising in modern computer-communication networks, both wire-line and wireless, carrying traffics with heterogeneous characteristics. A conceptual and analytical approach to the design of network protocols in harmony with the appropriate modeling of the traffic and network environments. Issues covered include routing, transmission, performance monitoring, as well as and network management in ATM multi-media networks. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5276 - Digital Control Systems

Analysis and design of discrete-time systems, as occurs when a digital computer is used to control physical systems. Topics include difference equations, Z-transform, sampled-data system modeling, sampling, discrete equivalents, stability, and discrete control design by root locus, direct design, frequency-response, and state space. Prereq: ELEC 3316, ELEC 3817, and graduate standing. Cross-listed with ELEC 4276. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ELEC 5294 - Advanced Power Electronic Systems

Topics to be covered include: three-phase diode/thyristor bridge rectifiers; three-phase voltage source converters; matrix converters; FACTS devices; Custom Power devices; converter's design, control and modulation strategies. Prereq: ELEC 4174 or ELEC 5174. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5333 - Introduction to Computational Electromagnetics

An intro to computational electromagnetics based on the Finite Difference Time-Domain (FDTD) covering, finite difference methods, the Yee algorithm, numerical error, stability, boundary conditions, source excitations, hands-on programming experience and application of FDTD to real problems. Prereq: ELEC 3133 or grad standing. cross-listed with ELEC 4333. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5334 - Advanced Computational Electromagnetics

This course on advanced computational electromagnetics covers Green's theorems and identities, vector potential theory, equivalence principles, numerical linear algebra, numerical integration, method of weighted residuals, integral equation methods, method of moments, and Prereq: ELEC 4133 or ELEC 5133 or grad standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5373 - Optical Engineering

This course introduces some of the most important concepts in optical engineering and prepares students a solid foundation to apply them to applications in the industry and academic research. Prereq: ELEC 3133. Cross-listed with ELEC 4373. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5375 - Engineering Neuroscience

In this course, mathematical models and data processing strategies will be introduced as well as other cutting-edge research techniques to help students understand how these techniques can be applied to solve modern neuroscience problems. Prereq: ELEC 3316 or graduate standing. Cross-listed with ELEC 4735 and NRSC 7674 (Anschutz Medical Campus course). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5423 - Radio Frequency Laboratory

Projects involve modern RF analyzers, waveguide devices, time-domain techniques, characterization of devices, signal propagation and scattering, harmonic mixing, and radio frequency identification. Students will gain experience using MATLAB for data acquisition and processing. Graduate students will explore projects in greater detail. Cross-listed with ELEC 4423. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 5433 - Fundamentals and Applications of Plasmas

This course provides an introduction to plasmas, also known as the fourth state of matter, in nature and industry. Topics covered include single particle motions, plasma kinetic and fluid theory, cold and warm plasma models and interaction of electromagnetic waves with plasmas. Applications ranging from space sciences to medicine are explored. Prereq: ELEC 3133 for undergraduate students or permission of the instructor. No prerequisite for CEAS graduate students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5436 - Nonlinear Control Systems I

Analysis and synthesis of nonlinear feedback control systems. Linearization's and stability in the small, equivalent linearization and the describing function. The dual input describing function. Stability in the large and the second method of Lyapunov. Stability of time-varying systems. Popov's method and extensions. Prereq: ELEC 4136 or 4276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5444 - Power System Laboratory

This lab introduces the student to modern computational tools used in power system analysis. Algorithms to solve the "power flow problem", the "economic dispatch problem", and the "optimal power flow problem" are discussed and implemented in the Matlab-Simulink mathematical analysis software package. Prereq: ELEC 4184 & 5184. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 5446 - Introduction to Modern Control Theory

State space representation of dynamic systems. Canonical forms. Frequency domain analysis. Controllability and observability. Design by statespace methods: pole-placement, linear observers, separation principle, robustness. Linear, quadratic optimum control. Prereq: ELEC 4136 or 4276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5455 - Computer Methods for Device Electronics

Numerical analysis of PN junctions, Bipolar transistors, GAAS MESFETS, and MOSFETS. Numerical solution of discrete-form equations. Finite-difference method for semiconductor devices. Two-dimensional models: DC, transient, and small signal numerical analysis. Prereq: ELEC 4025 or 5025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5456 - Sampled Data and Digital Control Systems

Elements of sampling theory. Overview of design approaches via transform methods. Analysis and design in state space. Optimal control systems. Emphasis is placed on computer-aided design projects. Prereq: ELEC 4276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5466 - Adaptive Control System Design

Basic concepts in adaptive feedback control. Overview of application areas. Stability of non-linear systems and hyperstability approach to the design of adaptive controllers. Passivity concept and Liapunov stability. Design of model reference adaptive systems, self-tuning regulators, stochastic adaptive, and dual control systems. Computer-based design applications. Emphasis is placed on design projects. Prereq: ELEC 4136 or 4276. Cross-listed with ELEC 4466. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5474 - Power Electronics Laboratory

The power electronics laboratory introduces students to seven fundamental switchmode power conversion topologies, along with voltage and current feedback control, assembled on a reconfigurable power pole circuit board with external power supplies and laboratory. Cross-listed with ELEC 4474. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ELEC 5476 - Optimal Control Systems

Liapunov stability and quadratic optimal control problems. The minimum principle and the Pontryagin maximum principle. Variational calculus and Hamilton-Jacoby-Bellman equation. The separation principle of LQG control. Combined optimal state estimation and control. Differential and difference Riccati equations. Tracking and disturbance rejection. Computer-aided design applications. Prereq: ELEC 4136 or 4276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5486 - Modeling and System Identification

Linear time-invariant and time-varying models. Nonlinear state space models. Non-parametric methods. Parameter estimation methods. Convergence and consistency. Computational methods in estimation. Recursive estimation methods. Experiment design and choice of identification criterion. Model structure selection and model validation. Prereq: ELEC 3817 or MATH 3800, and ELEC 4136 or 4276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5496 - Robust Control

Background mathematics: function spaces and operators, and factorization theory. Stability theory: stability and stabilizability parameterization, closed-loop transfer matrices. Model-Matching Theory: solution existence, SISO Design, the Nehari problem. Performance bounds. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5501 - Microprocessor-Based Design

Covers advanced treatment of embedded system design using microprocessors. Analog input circuitry is interfaced to a microprocessor, and a PC board layout is created to develop a complete system design. Software/Operating System is implemented for realtime I/O. Prereq: Graduate standing or permission of instructor. Cross-listed with ELEC 4501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5511 - Hardware-Software Interface

Computer engineering methods in hardware and software design applied to problems drawn from the mini- and micro-computer systems field. Hardware and software techniques for the design of combined hardware or software are developed. Interface and real-time programming techniques are considered. Graduate level requires additional projects and homework. Prereq: Graduate standing or permission of instructor. Cross-listed with ELEC 4511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5521 - Design and Test of Digital Systems

Application of hardware description languages to the design, synthesis, analysis, and testing of digital and computer systems; modeling and simulation constructs; modern hardware description languages, including VHDL, logic and behavioral synthesis; rapid-prototyping; FPGA and standard-cel ASIC design; design for testability; and electronic design automation. Prereq: ELEC 3651 or graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5522 - VLSI Systems

Examines the design of very large-scale integrated (VLSI) systems from the logic to physical levels, including MOS transistor design, CMOS fabrication and design rules, device and wafer processing, inverter and complex gate design, mask level layout, VLSI system components and architectures, algorithms for VLSI computer-aided design, and testability. Prereq: ELEC 3215 and 3651 or graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5551 - Pattern Recognition

Pattern recognition techniques from image processing and artificial intelligence are explored. Topics include neural networks, morphological processing, wavelets, fractals, and basic image understanding. Prereq: ELEC 3316 and 3651. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5555 - VLSI Circuit Simulation

Computer methods for large integrated circuits. Theory and practice of VLSI circuit simulation. Nodal formulations of networks. Computer generation of sensitivities. Modeling active devices. DC solution of nonlinear networks. Prereq: Graduate standing or permission of instructor. Cross-listed with ELEC 4555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5617 - Random Processes for Engineers

Probability, sequences of random variables, specification of stochastic processes, stationarity, correlation functions and spectral densities, linear mean-square estimation, central limit theorems, law of large numbers, non-stationary random processes, stochastic differential equations and Karhunen-Loeve expansion, Kalman filtering. Prereq: ELEC 3316 and ELEC 3817 and permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5627 - Stochastic Point Processes

Presents modeling physical phenomena characterized by highly localized events distributed randomly in a continuum. Applications include optical communications, queuing theory, decision theory, nuclear medicine and electron microscopy. Topics include Poisson counting processes and its generalizations; stochastic differential equations used in filtering; martingales and Brownian motion. Prereq: ELEC 3817 or ELEC 5617. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5637 - Digital Signal Processing

Discrete-time signals and systems in the time and frequency domain. Digital filter structures, design of FIR filters by windowing, optimum approximations of FIR filters. Design of digital IIR filters from continuous time domain. Computer-aided design of digital filters. The discrete Fourier transform and DSP algorithm implementation. Analysis of finite word length effects. Application of digital signal processing. Prereq: ELEC 3316 and 3817. Cross-listed with ELEC 4637. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5638 - Digital Image Processing

Basics of two-dimensional (2-D) systems theory, including 2-D Fourier transform, Z-transform, and difference equations. Design of 2-D filters for image processing applications. Image transforms, including the 2-D FFT, cosine, Hadamard and KL. Image enhancement and restoration techniques. Method of image coding and compression. Prereq: ELEC 3133, 3215, 3225, 3316, 3817 or graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5644 - Introduction to Biomedical Imaging

An important component of the recent expansion in biomedical engineering is the area of biomedical imaging. This ELEC 4644/5644 course is an introduction to biomedical imaging systems, not only covering the fundamentals of imaging physics but also the applications of four primary biomedical imaging modalities: X-Ray Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Nuclear Medicine (i.e. PET, SPECT), and Ultrasound Imaging. Prereq: Graduate standing, or permission of instructor. Cross-listed with ELEC 4644. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5647 - Adaptive Signal Processing

Optimal filtering and identification of signal processing models. Martingales and analysis of recursive estimation algorithms. LMS and RLS adaptive filters. Stability, convergence and robustness of adaptive algorithms. Adaptive noise cancellation, time delay estimation and blind equalization. Adaptive differential pulse code modulation, adaptive prediction, adaptive Kalman Filters. Applications and implementation of adaptive algorithms. Prereq: ELEC 5637. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5648 - Blind Signal Processing

Introduction to gradient optimization methods. Introduction to adaptive filtering. Principal component analysis and whitening. Robust and adaptive PCA. Blind SOS parameter estimation and deconvolution. Fundamentals of independent component analysis. Blind equalization of SIMO and MIMO systems. ICA by maximization of nongaussianity. ICA by MLE and minimization of mutual information. Applications and practical considerations. Prereq: Graduate standing. Cross-listed with ELEC 6648. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5657 - Detection and Estimation Theory

Introduces detection and extraction methods used in signal processing, including decision theory; detection of known and random signals; optimum receiver design; estimation theory; Wiener filtering; Kalman-Bucy filtering; and applications to communication systems. Prereq: ELEC 5617. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5667 - Wavelet Theory and Applications

Topics include: fundamentals of signal decomposition; theory of filter banks; multi-resolution analysis and fast wavelet transforms; applications image and video image and video compression; and denoising and feature detection. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5678 - Quantum Electronics

The course teaches students to understand the basic concepts of quantum mechanics and to learn the mathematical tools needed and to be familiar with some of the technical knowledge that applies quantum mechanics to various advanced problems in engineering. Prereq: PHYS 2331 and MATH 3195. Cross-listed with ELEC 4678. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5687 - Optical Communication Systems

System aspects of optical communication system design. Basic principles of sources, channels, detectors, counting statistics, amplifiers, and coding with regard to the performance limitations they place on the communication system. Prereq: ELEC 3133. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5688 - Introduction to Nondestructive Testing

A basic, broad understanding of the principles of nondestructive testing and evaluation is provided. The main objective of this course is to attract students to NDT fields and eventually help address the increasing needs of NDT engineers and technicians. Interaction and collaboration with local NDT industries will also be emphasized. As an introductory

course, a broad interdisciplinary knowledge of NDT will be covered in the following sub-areas: Visual, Penetrant, Magnetic Particle, Eddy Current, Microwave, Ultrasonic, and Radiography. Prereq: Graduate standing, or permission of instructor. Cross-listed with ELEC 4688. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5697 - Optical and Spatial Information Processing

Processing of two- and three-dimensional spatial information. The scalar diffraction theory necessary to describe the information-bearing wave-front. Wave-front recording, modulations, and reconstruction. Holography, Fourier transform properties of lenses, two-dimensional convolution and correlation, pattern recognition, and optical information processing. Prereq: ELEC 3316. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5710 - Advanced Electric Drive Systems

Covers advanced theory and implementation techniques for rotating electric machinery drives. Topics include field oriented control theory, detailed dynamic modeling of induction machine/drive system, advanced control algorithms and controller design. Prereq: ELEC 4164/5164 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5714 - Energy Systems Analysis

Transmission line constants, including details of GMD methods, skin effect. Analysis of balanced and unbalanced line using distributed parameters, energy flow from circle diagram approach, traveling-wave phenomena, corona, power cables and fundamentals of DC transmission. Prereq: ELEC 4184. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5720 - Practical Electric Drive Systems

Covers practical control theory and implementation techniques for electric machine drives for rotating electric machinery using high-performance hardware and software. Topics include machine theory review, power converter, control theory, controller design and actual implementation of an induction machine drive using up-to-date microcontroller hardware and software. Prereq: ELEC 2520, ELEC 4164/5164 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5723 - High Performance Computer Architecture

High Performance Computer Architecture covers the design of advanced computing systems. In particular, the course includes the design of modern microprocessors, characteristics of the memory hierarchy, and issues involved in multithreading and multicore architectures. Prereq: ELEC 3651 Digital Hardware Design. Cross-listed with ELEC 4723. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5725 - Advanced Electric Machinery

Covers theoretical principles and techniques of electric machine analysis focusing on rotating machinery. Topics include various machine definitions, properties and analysis, software tools, and examples. Prereq: ELEC 3164 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5727 - Computer Vision & Image Processing Acceleration

Real-time constraints on computer-vision and image processing applications have motivated numerous explorations of multicore architectures to provide more efficiency through hardware parallelism and acceleration. This course undertakes the study of image processing and computer vision algorithms in the context of parallel hardware. Cross-listed with ELEC 4727. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5755 - Renewable Energy Systems

This course focuses on the modeling, analysis and control of grid-connected wind and photovoltaic energy systems. Prereq: permission of instructor. Cross-listed with ELEC 4755. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ELEC 5764 - Power Distribution Systems

Use of per-unit methods to find transient voltage behavior of industrial power systems resulting from motor starting, spotwelders and similar stimuli. System and device responses due to series and shunt capacitors and problems of subharmonics and over-excitation on induction motors. Design of power distribution systems. Prereq: ELEC 4184. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5774 - Power Systems Dynamics and Protection

Topics to be covered include: power system dynamic fundamentals, various stability problems, such as angle, frequency and voltage stability; protection of power systems apparatus and protective relays coordination. Prereq: ELEC 4184/5184 or graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 5800 - Special Topics

Intermediate courses of variable title and variable credit, usually offered once by guest lecturers. See current departmental notices for details. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 5840 - Independent Study: ELEC

Offers the opportunity for independent, creative work. Prereq: Permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ELEC 5980 - Statistical Quality Control

Introduces statistical methods of quality control. Statistical process control, process capability, statistical design of experiments and total quality management. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 6000 - Statistical Signal Processing

The objective of this course is to present a systematic coverage of statistical signal processing methods which are fundamental for processing, identifying and classifying stochastically (randomly) generated data sequences. Emphasis will be given to methods which resist data outliers. Important applications include communications and biological systems. Prereq: ELEC 5617 or consent of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 6648 - Blind Signal Processing

Introduction to gradient optimization methods. Introduction to adaptive filtering. Principal component analysis and whitening. Robust and adaptive PCA. Blind SOS parameter estimation and deconvolution. Blind equalization of SIMO and MIMO systems. Methods of independent component analysis. Algorithms for blind source separation. Prereq: ELEC 5617. Cross-listed with ELEC 5648. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ELEC 6800 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 6950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

ELEC 6960 - Master's Report

Max hours: 8 Credits. **Semester Hours:** 1 to 8

ELEC 7800 - Special Topics

Courses of variable title and variable credit, usually offered once by guest lecturers. See current departmental notices for details. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7801 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7802 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7803 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7804 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7805 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7806 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7807 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7808 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7809 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ELEC 7840 - Independent Study: ELEC

Offers the opportunity for independent, creative work. Prereq: Permission of instructor. Max hours: 6 Credits.
Semester Hours: 1 to 6

ELEC 8990 - Doctoral Dissertation

Max hours: 10 Credits. **Semester Hours:** 1 to 10

ENGL 1010 - Writing Workshop

Focuses on the abilities and skills needed to write effective expository prose. Emphasizes frequent writing, both in and out of class, with special attention to writing short essays well. Writers learn to write confidently at the sentence and paragraph levels, and to develop their grammatical and mechanical skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 1020 - Core Composition I

Provides opportunities to write for different purposes and audiences, with an emphasis on learning how to respond to various rhetorical situations; improving critical thinking, reading, and writing abilities; understanding various writing processes; and gaining a deeper knowledge of language conventions. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-C01. **Semester Hours:** 3 to 3

ENGL 1050 - Vocabulary for Professionals

Studies English words derived from Latin and Greek by analyzing their component parts (prefixes, stems, and suffixes). Cross-listed with LATN 1050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENGL 1200 - Introduction to Fiction

Introduces class members to the works of famous authors as well as to major themes, elements, and techniques of fiction in both short stories and novels. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 1400 - Literary Studies

Helps students develop a sense of literary techniques and issues so they can bring an improved critical sensibility to their reading and writing. Note: Designed for students who are seriously interested in literature. Prereq or Coreq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 1601 - Telling Tales: Narrative Art in Literature and Film

Asks students to explore how stories determine who we are. Everything people do fits into a narrative pattern, evident everywhere from TV news to memory to daily schedules. We tell ourselves stories about ourselves and others--how do these stories shape who we are as cultural beings? Prereq or Coreq: ENGL 1020. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH2. **Semester Hours:** 3 to 3

ENGL 2030 - Core Composition II

Focuses on academic and other types of research-based writing and builds on the work completed in ENGL 1020. Focuses on critical thinking, reading and writing as well as working with primary and secondary source material to produce a variety of research-based essays. Emphasis on using both print-based and electronic-based information. Prereq: ENGL 1020. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-C02. **Semester Hours:** 3 to 3

ENGL 2060 - Introduction to Writing Studies

Introduces students to the topics of study in the English Writing major. Topics include writing studies (literacy, genre, research, and multimodality), rhetoric (history and theory), and the teaching of writing (pedagogy and practice). Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2070 - Grammar, Rhetoric and Style

Teaches the basics of English grammar in order to develop a rhetorical and stylistic confidence in reading and writing, using an approach that is more descriptive than prescriptive. Teaches students how to evaluate the grammatical choices of established writers and how to develop flexibility in the grammatical choices they make in their own writing. Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2154 - Introduction to Creative Writing

Reading, discussing, writing short fiction and poetry in a workshop setting. Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2250 - Introduction to Film

Introduces students to the critical study of cinema as an art form and a cultural phenomenon. Topics include cinematography, editing, mise-en-scene and sound; the connections between cinema and related art forms; film genres; the social dimensions of film production and reception; and films by such key filmmakers as Alfred Hitchcock, Maya Deren and Spike Lee. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2300 - Topics in Literature and Film

Courses supplement the regular program of the department, offering such topics as: literary perceptions of motherhood, Asian-American literature, literary classics of science, and contemporary women writers. Note: Can be taken more than once if topics vary. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 2310 - Topics in Literature and Film

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2320 - Topics in Literature and Film

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2330 - Topics in Literature and Film

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2340 - Topics in Literature and Film

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2390 - Writing the Short Script

Examines narrative screenwriting elements--premise, theme, conflict, protagonist/antagonist, setting/situation, dialogue, plot structure, imagery--required to create a strong narrative short film. Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2415 - Introduction to Movie Writing

Examines structural and dramatic elements required to write a feature-length screenplay. Students conceptualize, plan, write and then re-write to complete the first ten pages of their own feature-length screenplay. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2450 - Introduction to Literature

Provides the terms and skills for analyses of a variety of narratives. Develops critical thinking, reading, and writing necessary for succeeding in the discipline. Prereq: ENGL 1020. Note: required introductory course for English majors, English minors, and English education. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2510 - Greek and Roman Mythology

Surveys influential literature from Greece and Rome. Among the Greek works are Homer's epics, Sophocles's tragedies, Plato's and Aristotle's philosophical writings. Among the Roman works are the writings of Vergil, Ovid, the elegists and historians. a brief look at Augustine's writings concludes the course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2520 - The Bible as Literature

Introduces students to biblical literature. Selections from the various genres of writing in Hebrew (history, wisdom, prophecy, literature) are read and discussed, as well as representative sections from the New Testament, including the gospels and the writings of Paul. Cross-listed with RLST 2700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 2600 - Great Works in British and American Literature

Traces the traditions of British and American literature from medieval times to the present, by examining a variety of texts, studying the impact of different time periods, and cultural movements on the evolving literary tradition. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH2. **Semester Hours:** 3 to 3

ENGL 2840 - Independent Study: ENGL

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENGL 3001 - Critical Writing

Introduces literary theory to provide extensive practice in writing about literature. Note: Required of English majors and minors with a literature option and education English majors. Prereq: ENGL 2450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3020 - Poetry Workshop

Practical workshop for developing poetic craft, focusing on writing process and specialized topics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3050 - Fiction Workshop

Beginning workshop for defining and developing narrative craft, focusing on writing process and specialized topics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3070 - Film History I

Examines the history of cinema from its 19th-century origins until the early sounds era. Explores important developments and influences in American and international cinema, including the origins of Hollywood narrative, avant-garde cinema, German Expressionism, and Soviet Cinema. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3075 - Film Genres

An intensive study of films of one or more significant genres, such as comedy, film noir, science fiction. Prereq: Sophomore standing. Note: May be taken more than once when genres vary. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3080 - Film History II

Examines world cinema from 1938 to the present, with examples from major movements and directors--such as Film Noir, Italian Neo-Realism, the French New Wave, Jean Renoir, Agnes Varda, John Ford, Alfred Hitchcock and Werner Herzog. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3084 - Multimedia Composition

Offers students opportunities to examine and compose texts where language is integrated with other media, such as video, still images, music, etc. Includes basic instruction in digital multimedia composition and design tools. ENGL 2070 recommended. Prereq: Junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3085 - Film Directors

An intensive study of the films of one or more major directors, such as Chaplin, Keaton, Hitchcock, Welles, Coen Brothers. Prereq: Sophomore standing. Note: May be taken more than once when directors vary. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3106 - Advocate Practicum

Hands-on course introduces writers to the UCD student newspaper "The Advocate," and allows students to write and edit more effectively. Students work with faculty, professionals, and student editors to practice and produce writing for actual publication. Prereq: ENGL 2030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3154 - Technical Writing

Introduces the study and writing of technical documents. Emphasizes the processes, style, structure, and forms of technical writing. Attention is paid to audience analysis, organization, clarity and precision. ENGL 2070 recommended. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3160 - Language Theory

Provides a basic introduction to linguistics and language theory, including phonetics, grammar, semantics, pragmatics, sociolinguistics, cognitive processing, and language acquisition. Includes practical applications of the theories and methodologies presented. ENGL 2070 recommended. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3170 - Business Writing

Focuses on the strategies and techniques of business writing, with emphasis on reader, message and form. ENGL 2070 recommended. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3200 - From Literature to Film

Explores the relationship between literature and cinema; the process of adapting and transforming a novel into a feature-length film; and the historical, cultural, and commercial influences that shaped the creation of each novel and film studied. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3300 - Topics in Film

Courses supplement the department's regular course offerings. Recent topics have included women and film, movies as history and film comedy. Prereq: Sophomore standing. Note: Open to both majors and non-majors. Can be taken more than once when topics vary. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3310 - Topics in Film

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3320 - Topics in Film

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3330 - Topics in Literature

Courses supplement the department's regular course offerings. Recent topics have included Tolkien and international short stories. Prereq: Sophomore standing. Note: Open to both majors and non-majors. Can be taken more than once when topics vary. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3340 - Topics in Literature

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3350 - Topics in Literature

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3355 - Genre Topic

Through class discussion and various projects, students will delve in to a specific genre of literature such as memoir, drama, horror, speculative or detective fiction. Note: repeatable with a different topic title. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3405 - Topics in Writing

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 3415 - Screenwriting Workshop

Continues and expands ENGL 2415. By the end of ENGL 3415, students have completed the first two acts of their screenplay. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3416 - Magazine Writing

An intensive, practical course in writing non-fiction with an emphasis on journalistic approaches for daily, weekly, and monthly publications. Prereq: Students must have junior standing/60 units of credit completed. ENGL 1020 is strongly recommended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3417 - Writing for the Mass Media

Students will examine public relations writing techniques and journalistic style, public relations theory and ethics, and practical client work. Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3450 - Twentieth Century Women Writers

Examines how women write about a specific theme, such as home, work, family, the "Other," as well as how women's writing may differ from men's. Theme and genre vary. Prereq: Sophomore standing. Cross-listed with WGST 3450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3480 - Modern Drama

How does drama change from the pioneering realism of Ibsen and Chekhov to the Absurdism of Ionesco and Pinter and beyond? The course covers plays in English and translation from the late nineteenth to the twenty-first century, with attention to performance as well as literary texts. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3520 - Religious Narratives

Investigates the language and structure of religious discourse in Western literature. Welcomes interdisciplinary and comparative perspectives with a focus on cultural constructions of the sacred. Prereq: Sophomore standing. Cross-listed with RLST 3720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3661 - Shakespeare

Introduces some of Shakespeare's major plays and poems, which usually includes Richard II, Romeo and Juliet, Measure for Measure, Othello, King Lear, Anthony and Cleopatra and The Tempest. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3700 - American Literature to the Civil War

Surveys American literature from the colonial era to the Civil War. Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3750 - American Literature after the Civil War

Surveys American literature from the Civil War to the contemporary era. Prereq: ENGL 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3795 - Race and Ethnicity in American Literature

Focuses alternately on one of several ethnic American literary traditions (e.g. African American, Chicano) and their historical, geographical, social and economic communities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3798 - International Perspectives in Literature and Film

Fosters an understanding of peoples outside of the U.S. through the study and appreciation of non-western literature. Investigates how historical, cultural, and ideological forces constitute race, ethnicity, nationalism, and alienation in a single country or across a region. Topic and country/region varies by semester. Note: May be repeated for credit when title and content are different. All texts in English translation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 3840 - Independent Study: ENGL

Prereq: Sophomore standing. Max hours: 6 Credits. **Semester Hours:** 1 to 3

ENGL 3939 - Internship

Employment situations designed and supervised by members of the faculty; concepts and skills developed in the classroom are used in business and public service contexts. Prereq: Junior standing or higher. Before enrolling, students should contact the Career Center. Note: Up to six hours may be counted toward the major. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGL 3995 - Travel Study

An intensive course focusing on cinematic, literary, or rhetorical topics enriched through travel. Subtitles reflect specific area of concentration. Students may repeat course with different topics. Registration is through the Office of International Affairs. Max hours: 12 Credits. **Semester Hours:** 3 to 6

ENGL 4000 - Studies of Major Authors

An intensive study of works of one major British or American author. Examples: Dickens, Woolf or James. Prereq: Sophomore standing. Cross-listed with ENGL 5000. Max hours: 15 Credits. **Semester Hours:** 3 to 3

ENGL 4025 - Advanced Poetry Workshop

Advanced poetic craft, including exercises in mode, genre and advanced revision. Prereq: ENGL 3020 (or equivalent) for English majors and minors only; all others must obtain permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4055 - Advanced Fiction Workshop

Advanced workshop for developing and deepening narrative craft, focusing on writing process and specialized topics.

Prereq: ENGL 3050, English major and minor only; all others must obtain permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4080 - History of English Language

Examines how English has changed since A.D. 800 through examples of writing from different periods, with attention to the way various groups have enriched our vocabulary and altered our syntax. Note: this course assumes that students have completed ENGL 2070 or one year of college level coursework in a foreign language. Cross-listed with ENGL 5080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4088 - Literary Editing: Copper Nickel

Literary editing in theory and practice, using UCD's nationally recognized journal "Copper Nickel." Topics may include evaluating fiction, poetry and nonfiction; design and aesthetics; line editing; the business of literary journals. Prereq: ENGL 3020 or 3050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4160 - Poetics

"Mechanics" of poetry in English, including meter, rhythm, rhyme, line, and other systems of measurement and logic. Emphasis is on historical development of poetic art in English. Prereq: ENGL 1400. Cross-listed with ENGL 5160. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4166 - History of American Poetry

Examines major American poets and poetic trends from the colonial period to the present, with attention to cultural contexts and to development of distinctively American practices. Prereq: Sophomore standing. Cross-listed with ENGL 5166. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4175 - Writing in the Sciences

Provides rhetorical analyses of scientific discourse and student practice in writing research reports and proposals. Prereq: sophomore standing or higher. Cross-listed with ENGL 5175. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4180 - Argumentation and Logic

Explores the history of logic and its role in argumentation, studies various types of logical structures, and analyzes current uses of argumentation, with attention to writing arguments on current public issues. ENGL 3084 recommended. Prereq: Students must have junior standing/60 units of credit completed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4190 - Special Topics in Rhetoric and Writing

Focuses on particular issues in rhetoric and writing as they pertain to reading and writing, including language and

gender, language and culture, and language of political action. ENGL 3084 recommended. Prereq: Must have completed 60 semester hours. Cross-listed with ENGL 5190. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 4200 - History of the English Novel I

Rise and development of the English novel from its beginnings in the 18th century through the mid-19th century, including such writers as Defoe, Fielding, Austen and Shelley. Prereq: Sophomore standing. Cross-listed with ENGL 5200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4210 - History of the English Novel II

Overview of the English novel from mid-19th century to World War II, emphasizing the important developments which the form underwent in the hands of notable novelists, including Charles Dickens, the Brontes, George Eliot, Henry James, Joseph Conrad, D.H. Lawrence and Virginia Woolf. Prereq: Sophomore standing. Cross-listed with ENGL 5210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4220 - African-American Literature

Surveys African-American literature with special emphasis on post-Civil War writing. Prereq: Sophomore standing. Cross-listed with ENGL 5220, ETST 4220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4230 - The American Novel

Surveys major developments in the American novel from the 18th century to the 21st century. Prereq: Sophomore standing. Cross-listed with ENGL 5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4235 - Faulkner

Studies the works of Faulkner's high period with special attention to southern themes and Faulkner's experimentation with narrative form. Prereq: Sophomore standing. Cross-listed with ENGL 5235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4236 - The American Short Story

Traces the development of the short story in the United States, from its beginnings in colonial tales to its contemporary renaissance as a dominant literary form. Prereq: Sophomore standing. Cross-listed with ENGL 5236. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4240 - Topics in Contemporary American Literature

Seminar focusing on a segment of contemporary American literature. Prereq: Sophomore standing. Cross-listed with ENGL 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4250 - Twentieth Century Fiction

Deals with novels originating in a variety of countries in an effort to see the similarities and differences that varying nationalities bring to the genre. Prereq: Sophomore standing. Cross-listed with ENGL 5250. Max hours: 3 Credits.

Semester Hours: 3 to 3

ENGL 4280 - Proposal and Grant Writing

Focuses on research, design, composition, and editing original proposals. Includes idea development, identification of funding sources, and the creation of persuasive documents. ENGL 3084 recommended. Prereq: Students must have junior standing/60 units of credit completed. Cross-listed with ENGL 5280. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4290 - Rhetoric and the Body

Investigates the relationship between rhetoric and the body, with attention to theoretical and practical implications. Welcomes interdisciplinary perspectives, and often considers rhetorical topics from historical, medical, disability studies, economic, and/or gendered perspectives. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4300 - History of British Drama

Intended as a survey of British drama from the miracle plays of the medieval period, through the Renaissance and Restoration, to the "kitchen sink" realists of the 1960s. Prereq: Sophomore standing. Cross-listed with ENGL 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4306 - Survey of Feminist Thought

Examines changes and continuities in feminist thought from the 18th century to the present, using historical and literary materials. Explores the ways that women's characteristics, experiences, and capabilities have been understood and challenged. Cross-listed with ENGL 5306, HIST 4306, 5306, WGST 4306, 5306. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4308 - Contemporary Feminist Thought

This course explores contemporary feminist thought in philosophy and literature in the 20th and 21st centuries. Topics include lesbianism, black feminism, Chicana feminism, transgender identity, women and work and others. Cross-listed with ENGL 5308, PHIL 4308, PHIL 5308, WGST 4308, WGST 5308. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4320 - History of Poetry in English

Studies the major schools and eras of English prosody, including the poetry of Great Britain and the United States, from the medieval period to the present. Prereq: Sophomore standing. Cross-listed with ENGL 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4350 - History of American Drama

Studies American drama from its foundations in the 18th century through movements including realism, expressionism, symbolism, agit-prop, black nationalism, feminism, and performance art. Drama read as both text and performance, as sometimes supporting the status quo and as sometimes subverting it. Prereq: Sophomore standing. Cross-listed with ENGL 5350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4400 - Old English I

Instruction in the Old English language. Prereq: Must have 30 semester hours or permission of the instructor. One year of college foreign language or ENGL 2070 recommended. Cross-listed with ENGL 5400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4410 - Old English II: Beowulf

Continuing training in the reading of Old English and intensive reading of Beowulf. Prereq: ENGL 4400 or 5400. Cross-listed with ENGL 5410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4416 - Advanced Magazine Writing

An intensive, practical continuation of the journalistic nonfiction techniques learned in Magazine Writing with an added emphasis on analytical reading, publication research, story reporting and pitching/writing for publication. Prereq: ENGL 3416 with a grade of C or better. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4420 - Film Theory and Criticism

(1) Familiarizes students with some of the central concepts and debates in film theory and criticism, both classic and contemporary, (2) enables students to develop advanced analytic and interpretive skills, and (3) guides students toward discovering and articulating original critical and theoretical perspectives. Prereq: Sophomore standing. Cross-listed with ENGL 5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4460 - Contemporary World Literature

Surveys literature written by world writers since World War II. Prereq: Sophomore standing. Note: Texts read in English. Cross-listed with ENGL 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4500 - Medieval Literature

Introduces representative writers from the Norman Conquest to about 1550. Emphasis on a variety of genres, including religious poetry, Arthurian romance, dream vision and drama. Prereq: Sophomore standing. Cross-listed with ENGL 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4510 - Whores and Saints: Medieval Women

Studies how women are presented in texts, as well as works by women. Investigates the roles open to women and societal attitudes toward women, who were considered seductresses, saints, scholars and warriors in the middle ages. Prereq: Nine hours of literature courses or instructor permission. Cross-listed with ENGL 5510, RLST 4730/5730, WGST 4510/5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4520 - English Renaissance

Introduces some of the important writers in this major period of English literature (1500-1660). Special attention to the works of Sidney, Milton, Spenser, Shakespeare, Donne, Herbert and Johnson. Prereq: Sophomore standing. Cross-listed with ENGL 5520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4530 - Milton

Extensive reading in John Milton's poetry (Lycidas, Paradise Lost, Paradise Regained, Samson Agonistes) as well as his political, social and theological writings. Prereq: Sophomore standing. Cross-listed with ENGL 5530. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4540 - Restoration and the 18th Century

Introduces some of the important writers of the "Age of Reason." Emphasis on such figures as Bunyan, Burke, Dryden, Johnson, Pope and Swift. Prereq: Sophomore standing. Cross-listed with ENGL 5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4560 - English Romanticism

Studies major works of the chief English writers of the first part of the 19th century, with emphasis on such representative figures as Wollstonecraft, Godwin, Blake, Wordsworth, Coleridge, Hazlitt, Byron, Keats and Shelley. Prereq: Sophomore standing. Cross-listed with ENGL 5560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4580 - The Victorian Age

Examines the main currents of Victorian thought in prose and poetry from about 1830 to the end of the century, including such writers as Browning, Carlyle, Mill, Newman, Ruskin, Swinburne and Tennyson. Prereq: Sophomore standing. Cross-listed with ENGL 5580. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4600 - Modernism

Modernist literature from the beginning of the 20th century through World War II, including such writers as Eliot, Joyce, Forester, Ford, Yeats, Woolf and Barnes. Examines the social-political influences as well as the aesthetic and stylistic elements which define modernist writing. Prereq: Sophomore standing. Cross-listed with ENGL 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4601 - Principles and Practices of Second Language Acquisition

Overview of basic principles and practices in the learning and teaching of English as a second language. ENGL 3160 recommended. Prereq: Students must have junior standing/60 units of credit completed. Cross-listed with ENGL 5601. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4610 - Narrative: Form and Theory

A critical and theoretical exploration of the elements of narrative -e.g., plot, character, dialogue, discourse-in literature and film. This course is especially useful for fiction-writing students in the Creative Writing Track. Prereq: ENGL 2450. Cross-list ENGL 5610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4651 - Second Language Writing

Topics include: similarities between first & second language writing, the processes of composition & revision, teacher response to student writing, student processing of feedback, writing assessment, and the reading/writing connection. ENGL 3160 recommended. Prereq: Students must have junior standing/60 units of credit completed. Cross-listed with ENGL 5651. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4720 - Honors in English

Designed for students taking departmental honors in English. Prereq: Students must have written permission from the honors advisor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4730 - Chaucer

Extensive reading in Chaucer's works in Middle English, including his lyrics, dream visions, Troilus and Criseyde, and the Canterbury Tales. Examines sources, historical and ideological factors influencing the texts. Prereq: Sophomore standing. Cross-listed with ENGL 5730. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4735 - Philosophy and Literature

Considers the philosophical dimensions of literature. Prereq: Sophomore standing. Cross-listed with ENGL 5735, PHIL 4730, 5730. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4740 - Honors in Writing

Designed for students taking departmental honors in English writing. Prereq: Student must have written permission from honors director and faculty advisor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4745 - Humanistic Writing About Medicine and Biology

Investigates medical and biological writing over the last two centuries with an emphasis on reception, ethical issues,

and the differences between professional and popular writing. Prereq: Sophomore standing. Cross-listed with 5745. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4770 - Topics in English: Film and Literature

May look at specific genres, aesthetic approaches to literature, ideological or socio-political agendas, or other special topics in literature and/or film. Prereq: Sophomore standing. Cross-listed with ENGL 5770. Max hours: 12 Credits. **Semester Hours:** 3 to 3

ENGL 4800 - Special Topics in Creative Writing

Writing-intensive courses combining reading, directed writing, peer- and instructor-led workshops in a topic to be determined by instructor. Topics may include projects in a specialized genre, such as science fiction or noir writing, or in a field of professional endeavor related to creative writing, such as the editing and production of a literary journal. Prereq: ENGL 2154; permission of instructor may be required. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ENGL 4810 - Literary Editing Practicum

Practicum for students interested in editing in a literary field, e.g., literary magazines, book manuscripts, anthology projects. Each semester the parameter of the practicum will be set by the instructor. Prereq: English majors and minors. All other students must have instructor's permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4820 - Senior Poetry Workshop

Capstone workshop for students within the Creative Writing major track or Creative Writing minor. Emphasis on a single, sustained project developed by the student. Prereq: ENGL 3020 and 4025 for English majors. All other students must obtain permission from the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4830 - Advanced Rhetorical Analysis

Immerses students in advanced methods for conducting rhetorical analysis and for reading critically. Students are expected to learn multiple frameworks for performing analysis on rhetorical artifacts. Prereq: Students must have senior standing/90 units of credit completed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4840 - Independent Study: ENGL

Max hours: 12 Credits. **Semester Hours:** 1 to 3

ENGL 4850 - Senior Fiction Workshop

Capstone workshop designed to deepen the understanding of narrative, and consciously apply the strategies of narrative craft to modern markets. Course will focus on the writing and publishing processes, culminating in a classroom

narrative defense and submission to professional outlets. Prereq: ENGL 4055. Restriction: Restricted to ENGL majors and minors only with senior standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENGL 4920 - Directed Readings

Explores an area of English literature not covered in regular course work. Note: May be taken as a precursor to honors essay, in which case student should consult with the honors advisor. Prereq: Senior standing. Max hours: 6 Credits. **Semester Hours:** 3 to 6

ENGL 4990 - Senior Writing Project in Creative Writing or Film Studies

Individual writing project consisting of a creative manuscript or critical study. Manuscript must be 30 pages of high quality text. Note: Available only to students in the creative writing and film tracks. Prereq: Senior standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 4991 - Senior Seminar in Writing

Students focus on rhetorical studies through extensive reading, writing, discussion, and reflection upon their own literacy practices. Students produce individual and collaborative writing projects for a final portfolio. Prereq: ENGL 3084, senior standing and EWRT majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4995 - Senior Writing Project

Individual writing project in any genre and any discipline upon approval of faculty advisor. Manuscript must be 30 pages of high quality text. Prereq: Senior standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 4999 - Literary Studies Senior Seminar

Allows students to pursue, learn, and apply advanced methodologies such as bibliographical, archival/historical, or cultural and ideological, and apply them to a single author, genre, or period of text. Students engage in research under the tutelage of their instructor. Note: Senior capstone course for literature majors in the literary studies track. Prereq: Senior standing and ENGL 3001 previously completed or concurrent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5000 - Studies of Major Authors

An intensive study of works of one major British or American author. Examples: Dickens, Woolf or James. Prereq: Graduate standing. Cross-listed with ENGL 4000. Max hours: 15 Credits. **Semester Hours:** 3 to 3

ENGL 5001 - Special Topics

This variable credit course offers intensive study of the teaching of writing in a collaborative action-oriented approach. Prereq: Graduate standing. Max hours: 12 Credits. **Semester Hours:** 1 to 6

ENGL 5080 - History of the English Language

Examines how English has changed since A.D. 800 through examples of writing from different periods, with attention to the way various groups have enriched our vocabulary and altered our syntax. Prereq: ENGL 2070 or one year of a college foreign language. Cross-listed with ENGL 4080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5093 - Teaching of Writing

Deals with the analysis of rhetorical theory with an emphasis on practical applications in the classroom, with attention to alternative pedagogies in teaching. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5100 - Introduction to Graduate Studies

Introduces students to scholarly methods & key debates in English Studies. Familiarizes students with department's specializations in film, linguistics, literature & rhetoric. Offers new MA students training in the primary forms of scholarly writing within the discipline (journal article, conference abstract, synopsis, book review). Restriction: Graduate standing or instructor permission is required for students to enroll in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5110 - Denver Writing Project

An intensive extended workshop in the development of one's personal and professional writing and in the teaching of writing. Open to those who are members of the Denver Writing Project. Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 9

ENGL 5120 - Denver Writing Project Advanced Institute

Advanced institutes provide intensive examination of an issue related to the teaching of writing. The specific issues are of two kinds--repeatable ones such as "Alumni Institute" and "Writing Retreat" and variable, such as "Action Research" and "Writing Across the Curriculum." Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 1 to 1

ENGL 5135 - English Language Study

Introduces students to varieties of English in use today, while tracing range of "new Englishes" back to origins of language. Students will develop an understanding of English as a global language, why it spread throughout the world and how, paying specific attention to print history of English and relationship to other print languages. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5145 - Theory

Designed to enrich students' understanding of a variety of modes of theoretical discourse that have influenced modern critical practice in English studies. While the course explores the evolution of criticism, it gives primary emphasis to recent developments. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5150 - Research Methods

Designed to prepare students for graduate scholarship in language, literacy, and the teaching of writing; should be taken soon after entering the program. Introduction to the research methods and stylistic standards for graduate-level writing. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5155 - Genres of Writing

Explores work of major contributors to genre and narrative theory. Offers students exposure to emergent genres in new media, while situating these new genre in relation to historical precedents. Gives students an introduction to the evolution of central genres in literary studies, such as novel, poem, political speech and western film. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5160 - Poetics

"Mechanics" of poetry in English, including meter, rhythm, rhyme, line, and other systems of measurement and logic. Emphasis is on historical development of poetic art in English. Prereq: ENGL 1400 or permission of instructor. Cross-listed with ENGL 4160. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5165 - Literacy and Technology

Studies the material forms in which English language has circulated-e.g., the history of the oral and manuscript tradition; the history of the book; and the impact of digital technologies on print culture. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5166 - History of American Poetry

Examines major American poets and poetic trends from the colonial period to the present, with attention to cultural contexts and to development of distinctively American practices. Cross-listed with ENGL 4166. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5171 - Language Theory

Introduces linguistic theory to the beginning graduate student. Builds upon the material included in the undergraduate class, by adding materials pertaining to the teaching of writing and graduate language studies. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5175 - Writing in the Sciences

Provides rhetorical analyses of scientific discourse and student practice in writing research reports and proposals. Prereq: graduate standing or higher. Cross-listed with ENGL 4175. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5190 - Special Topics in Rhetoric and Writing

Focuses on particular issues in rhetoric and writing as they pertain to reading and writing, including language and gender, language and culture, and language of political action. Cross-listed with ENGL 4190. Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 5200 - History of the English Novel I

Rise and development of the English novel from its beginnings in the 18th century through the mid-19th century, including such writers as Defoe, Fielding, Austen and Shelley. Cross-listed with ENGL 4200. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5210 - History of the English Novel II

Overview of the English novel from mid-19th century to World War II, emphasizing the important developments which the form underwent in the hands of notable novelists, including Charles Dickens, the Brontës, George Eliot, Henry James, Joseph Conrad, D.H. Lawrence and Virginia Woolf. Cross-listed with ENGL 4210. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5220 - African-American Literature

Surveys African-American literature with special emphasis on post-Civil War writing. Cross-listed with ENGL 4220, ETST 4220. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5230 - The American Novel

Surveys major developments in the American novel from the 18th century to the 21st century. Cross-listed with ENGL 4230. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5235 - Faulkner

Studies the works of Faulkner's high period with special attention to southern themes and Faulkner's experimentation with narrative form. Cross-listed with ENGL 4235. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5236 - The American Short Story

Traces the development of the short story in the United States, from its beginnings in colonial tales to its contemporary renaissance as a dominant literary form. Cross-listed with ENGL 4236. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5240 - Topics In Contemporary American Literature

Seminar focusing on a segment of contemporary American literature. Cross-listed with ENGL 4240. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5250 - Twentieth Century Fiction

Deals with novels originating in a variety of countries in an effort to see the similarities and differences that varying nationalities bring to the genre. Cross-listed with ENGL 4250. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5280 - Proposal and Grant Writing

Focuses on research, design, composition, and editing original proposals. Includes idea development, identification of funding sources, and the creation of persuasive documents. Prereq: Graduate standing. Cross-listed with ENGL 4280. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5300 - History of British Drama

Intended as a survey of British drama from the miracle plays of the medieval period, through the Renaissance and Restoration, to the "kitchen sink" realists of the 1960s. Cross-listed with ENGL 4300. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5306 - Survey of Feminist Thought

Examines changes and continuities in feminist thought from the 18th century to the present, using historical and literary materials. Explores the ways that women's characteristics, experiences, and capabilities have been understood and challenged. Cross-listed with ENGL 4306, HIST 4306, 5306, WGST 4306, 5306. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5308 - Contemporary Feminist Thought

This course explores contemporary feminist thought in philosophy and literature in the 20th and 21st centuries. Topics include lesbianism, black feminism, Chicana feminism, transgender identity, women and work and others. Cross-listed with ENGL 4308, PHIL 4308, PHIL 5308, WGST 4308, WGST 5308. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5320 - History of Poetry in English

Studies the major schools and eras of English prosody, including the poetry of Great Britain and the United States, from the medieval period to the present. Cross-listed with ENGL 4320. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5350 - History of American Drama

Studies American drama from its foundations in the 18th century through movements including realism, expressionism, symbolism, agit-prop, black nationalism, feminism, and performance art. Drama read as both text and performance, as sometimes supporting the status quo and as sometimes subverting it. Cross-listed with ENGL 4350. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5400 - Old English I

Instruction in the Old English language. One year of college foreign language or ENGL 2070 recommended. Cross-listed with ENGL 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5410 - Old English II: Beowulf

Continuing training in the reading of Old English and intensive reading of Beowulf. Prereq: ENGL 5400 or 4400. Cross-listed with ENGL 4410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5420 - Film Theory and Criticism

(1) Familiarizes students with some of the central concepts and debates in film theory and criticism, both classic and contemporary, (2) enables students to develop advanced analytic and interpretive skills, and (3) guides students toward discovering and articulating original critical and theoretical perspectives. Prereq: ENGL 2250 and 3070, 3080 or permission of instructor. Cross-listed with ENGL 4420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5460 - Contemporary World Literature

Surveys literature written by world writers since World War II. Note: Texts read in English. Cross-listed with ENGL 4460. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5500 - Medieval Literature

Introduces representative writers from the Norman Conquest to about 1550. Emphasis on a variety of genres, including religious poetry, Arthurian romance, dream vision and drama. Cross-listed with ENGL 4500. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5510 - Whores and Saints: Medieval Women

Studies how women are presented in texts, as well as works by women. Investigates the roles open to women and

societal attitudes toward women, who were considered seductresses, saints, scholars and warriors in the middle ages. Prereq: Nine hours of literature courses or instructor permission. Cross-listed with ENGL 4510, RLST 4730/5730, WGST 4510/5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5520 - English Renaissance

Introduces some of the important writers in this major period of English literature (1500-1660). Special attention to the works of Sidney, Milton, Spenser, Shakespeare, Donne, Herbert and Johnson. Cross-listed with ENGL 4520. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5530 - Milton

Extensive reading in John Milton's poetry (Lycidas, Paradise Lost, Paradise Regained, Samson Agonistes) as well as his political, social and theological writings. Cross-listed with ENGL 4530. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5540 - Restoration and the 18th Century

Introduces some of the important writers of the "Age of Reason." Emphasis on such figures as Bunyan, Burke, Dryden, Johnson, Pope and Swift. Cross-listed with ENGL 4540. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5560 - English Romanticism

Studies major works of the chief English writers of the first part of the 19th century, with emphasis on such representative figures as Wollstonecraft, Godwin, Blake, Wordsworth, Coleridge, Hazlitt, Byron, Keats and Shelley. Cross-listed with ENGL 4560. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5580 - The Victorian Age

Examines the main currents of Victorian thought in prose and poetry from about 1830 to the end of the century, including such writers as Browning, Carlyle, Mill, Newman, Ruskin, Swinburne and Tennyson. Cross-listed with ENGL 4580. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5600 - Modernism

Modernist literature from the beginning of the 20th century through World War II, including such writers as Eliot, Joyce, Forester, Ford, Yeats, Woolf and Barnes. Examines the social-political influences as well as the aesthetic and stylistic elements which define modernist writing. Cross-listed with ENGL 4600. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5601 - Principles and Practices of Second Language Acquisition

Overview of basic principles and practices in the learning and teaching of English as a second language. Cross-listed with ENGL 4601. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5610 - Narrative: Form and Theory

A critical and theoretical exploration of the elements of narrative -e.g., plot, character, dialogue, discourse-in literature and film. This course is especially useful for fiction-writing students in the Creative Writing Track. Prereq: Graduate standing. Cross-list ENGL 4610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5650 - American Literature to the Civil War

Graduate survey of American literature from the Colonial period to the Civil War, with particular attention to the question of what makes this literature distinctly American. Explores a wide range of genres of American literature in an effort to assess how this tradition of letters shaped our historical past and continues to influence contemporary American culture and ideology. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5651 - Second Language Writing

Topics include the similarities between first and second language writing, the processes of composition and revision, teacher response to student writing, student processing of feedback, writing assessment, and the reading or writing connection. Cross-listed with ENGL 4651. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5655 - American Literature: Civil War to the Cold War

Graduate survey of American literature from the Civil War to the Cold War considered central to the tradition of American literature. Students will consider how new ideas about gender, race, class, nationality, postcoloniality, history, and aesthetics have influenced the field of American literary studies. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5730 - Chaucer

Extensive reading in Chaucer's works in Middle English, including his lyrics, dream visions, Troilus and Criseyde, and the Canterbury Tales. Examines sources, historical and ideological factors influencing the texts. Prereq: Graduate standing. Cross-listed with ENGL 4730. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5735 - Philosophy and Literature

Considers the philosophical dimensions of literature. Cross-listed with ENGL 4735, PHIL 5730, 4730. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5745 - Humanistic Writing About Medicine and Biology

Investigates medical and biological writing over the last two centuries with an emphasis on reception, ethical issues, and the differences between professional and popular writing. Prereq: Graduate standing. Cross-listed with ENGL 4745. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 5770 - Topics in English: Film and Literature

May look at specific genres, aesthetic approaches to literature, ideological or socio-political agendas, or other special topics in literature and/or film. Cross-listed with ENGL 4770. Max hours: 12 Credits. **Semester Hours:** 3 to 3

ENGL 5840 - Independent Study: ENGL

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENGL 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENGL 5913 - Practicum in Language and Rhetoric

Supervised work in applied language or rhetoric and the teaching of writing. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENGL 5939 - Internship

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGL 6001 - Critical Theory in Literature and Film

Designed to enrich students' understanding of a variety of modes of theoretical discourse that have influenced modern critical practice in literary and film studies. While the course explores the evolution of criticism, it gives primary emphasis to recent developments. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6002 - Rhetorical Theory

Examines the principles and applications of rhetorical theory and its relationship to writing. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6010 - Studies of Major Authors

Note: May be repeated when topics vary. Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6011 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6012 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6013 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6014 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6015 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6016 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6017 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6018 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6019 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6090 - Studies in Major Authors

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGL 6110 - Special Topics in Literature

An intensive study of specialized topics in English and/or American literature. Note: May be repeated when topics vary. Prereq: Graduate standing. Max hours: 30 Credits. **Semester Hours:** 3 to 3

ENGL 6111 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6112 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6113 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6114 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6115 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6116 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6117 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6118 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6119 - Special Topics in Literature

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6120 - Special Topics in Film

An intensive study of specialized topics in film. Note: May be repeated when topics vary. Prereq: Graduate standing. Max hours: 30 Credits. **Semester Hours:** 3 to 3

ENGL 6121 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6122 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6123 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6124 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6125 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6126 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6127 - Special Topics in Film

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6128 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6129 - Special Topics in Film

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGL 6840 - Independent Study

Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGL 6920 - Directed Readings

Offers graduate student's instruction on an individual basis. Serves as preparation for the MA (literature) comprehensive examination. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ENGL 6950 - Master's Thesis

Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENGL 6960 - Master's Project

Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENGL 6970 - Portfolio Exam

In the portfolio exam, students prepare the culminating document of students' MA work, a portfolio combining reflection on work done at CU Denver with a forward look at students' career goals. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGR 1000 - Introduction to Engineering

Introduces engineering profession, engineering design and practice; and the tools used by engineers to accomplish design. The specialties within engineering are described. Students are involved in application projects and use word processors, spreadsheets and engineering software. Note: ENGR 1000 cannot be substituted for ELEC 1201. Prereq: High school trigonometry. Max hours: 3 Credits. **Semester Hours:** 1 to 1

ENGR 1111 - Psychological and Social Implications of Technology

This course will explore the impact of technology and its advances on human beings from an emotional, psychological, and social perspective. Discussions will include ethical, moral, and multicultural implications of technological

advances from a global perspective and will require students to critically analyze issues that arise from such advances.
Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGR 1208 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGR 1218 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1228 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1238 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1248 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1258 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1268 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1278 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1288 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 1298 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2208 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2218 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2228 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2238 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2248 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2258 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2268 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2278 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2288 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 2298 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3208 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3218 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3228 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3238 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3248 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3258 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3268 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3278 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3288 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3298 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 3400 - Technology and Culture

Explores the cultural and political foundations of technology and the impact of technology upon the individual and society. Contributions to technological advances and the impact of technology on women and diverse ethnic groups are examined in the context of specific engineering designs and case studies. Prereq: One course in social sciences, one course in humanities, one course in science. (Satisfies the multicultural diversity requirement of the UCDHSC core curriculum). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGR 3600 - International Dimensions of Technology and Culture

This course provides students with an understanding of how science, technology and international issues interrelate in a world that has become more interconnected and interdependent. The course will focus on the technical, organizational and cultural aspects of information and other technologies with an emphasis on their impact on third world countries. Prereq: One course in social sciences, one course in humanities, one course in science. (Satisfies the international perspectives requirement of the UCDHSC core curriculum). Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGR 3995 - Global Technology, Business & Culture

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENGR 4150 - Seminar: Special Topics in Engineering

A flexible seminar format dealing with topics of special interest in engineering. Topics vary from semester to semester. Prereq: Senior standing. Cross-listed with ENGR 5150 and 7150. Max hours: 1 Credit. **Semester Hours:** 0 to 1

ENGR 4208 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4218 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4228 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4238 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4248 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4258 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4268 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4278 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4288 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4298 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 4800 - Science Engineering and Culture for Undergraduates

Course for undergraduate international and limited English proficient (LEP) students to improve success in science and engineering degree programs through senior research paper writing , advanced STEM English skills and cross cultural training. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ENGR 4840 - Independent Study

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 5150 - Seminar: Special Topics in Engineering

A flexible seminar format dealing with topics of special interest in engineering on a graduate level. Topics vary from

semester to semester. Prereq: Graduate standing. Cross-listed with ENGR 4150 and 7150. Max hours: 1 Credit.
Semester Hours: 0 to 1

ENGR 5208 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 1 to 3

ENGR 5301 - Systems Engineering: Principles and Practice

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGR 5302 - Systems Engineering: Planning and Management

Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENGR 5303 - Special Topics: Systems Engineering

Max hours: 6 Credits. **Semester Hours:** 3 to 3

ENGR 5800 - Long Range Infrastructure Planning and Design: Colorado 2050

The goal of this course is to equip students to address the problems of long term future resource limitation and its influence on urban infrastructure in Colorado. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ENGR 7150 - Seminar: Special Topics in Engineering

A flexible seminar format dealing with topics of special interest in engineering on an advanced graduate level. Topics vary from semester to semester. Prereq: Graduate standing. Cross-listed with ENGR 4150 and 5150. Max hours: 1 Credit. **Semester Hours:** 0 to 0

ENTP 2550 - Introductory Accounting for Entrepreneurs and the Arts

An integration of financial and managerial accounting processes as they relate to Entrepreneurs, Arts & Media managers and similar applications. This course will cover the analysis and interpretation of financial statements, asset and liability valuation and the determination of net income. Incorporates the use of accounting information to make decisions focusing on cost behavior analysis, budgeting and product costing in entrepreneurial and arts related businesses. Prereq: MATH 1010, MATH 1110, or MATH 1070. Cross-listed with ACCT 2550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3000 - Principles of Entrepreneurship

Focuses on the concepts, skills, know-how, practical information, attitudes and alternatives that are relevant for start-up companies. The materials are designed to enhance the student's capacity to anticipate HR, financial, marketing problems through the application of proper planning. The primary objective of the course is to teach participants the practical aspects of entrepreneurship in order to change the odds of success. Prereq: sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3120 - Legal Issues for Entrepreneurs

Skills in legal and factual analysis and the application of ethical theories are addressed with an emphasis on applicability for entrepreneurs. The cases are drawn from a variety of functional areas such as accounting, information systems, finance, management, marketing and production. Topics include: agency law, business organizations, securities, venture capital, employment law, real property, entrepreneurial aspects of intellectual property law, consumer law and international law. Note: For non business majors only. Does not count towards an Entrepreneurship certificate. Prereq: ENTP 3000 or equivalent. Cross-listed with BLAW 4120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3200 - Essentials in Entrepreneurship

The course incorporates elements of the 'Lean Start Up Model,' designed to create efficiency in the value generation process, via learning, experimentation and adaption. In addition to covering fundamental business topics, the course also focuses on the requisite concepts, skills, practical information and attitudes for startup businesses. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3210 - Leadership in New Ventures

This course provides the student with an overview of key leadership principles for creating strategy and managing teams in a new venture. It introduces leadership concepts critical to gaining true organizational commitment, and focuses on case studies relevant to common business issues. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3220 - Entrepreneurial Marketing

Companies large and small face unique challenges successfully building a competitive advantage with limited marketing resources. Covers the analysis of marketing opportunities, identification of the targets, audience, and the development of a marketing strategy, brand positioning and an integrated marketing plan. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3230 - Small Business Accounting and Finance

Includes financial and legal aspects, financial reporting and cash flow analysis, financial planning, budgeting, working capital management, asset decisions, obtaining capital, business valuation, franchising, lease versus buy decisions, and financial aspects of international trade and different methods of obtaining capital. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3240 - New Concept Development

Understand business concepts, competitive offerings and potential customers' wants at their most fundamental level in this theory-driven course designed to help entrepreneurs assess the viability of new business concepts in potential markets. The course provides new ways of thinking about the attractiveness of industries and markets. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3250 - International Social Entrepreneurship

Provides the student with an overview of key trends and developments in international business. Familiarize the student with selected theories and concepts of international business and how it affects entrepreneurial functions. Study the people and organizations addressing pressing social and environmental issues facing society today. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3299 - Business Plan and Model Development

Business plan development which incorporates all key ingredients necessary for various users. Includes the ins and outs of business plans and models for new ventures through environmental scans of new business opportunities, case studies, by sharing the experience of entrepreneurs and investors that have been through the process. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 3500 - Entrepreneurship Law and Ethics

Students are taught to identify and resolve legal and ethical issues of particular interest to entrepreneurs, emphasizing hands-on experience with drafting commonly-used legal documents. Topics include intellectual property, business organizations, employment relationships, marketing/advertising law and contracts. Prereq: sophomore standing. **Semester Hours:** 3 to 3

ENTP 3780 - Preparing A Business Plan

Turn a new business idea into a viable new business by developing a comprehensive business plan including: analysis of the potential demand for the product or service and potential customers; identify competitive advantages and marketing strategies; generate pro forma financial projections; and, design the management team needed. Prereq: ENTP 3000 AND either ENTP 3500 with a grade of 'C-' or higher or BLAW 4120 or ENTP 3120 with a grade of 'C' or higher. For non-business majors only. Can be applied to Entrepreneurship Certificate. Business majors enroll in either MGMT 4780 or MKTG 4780. Come to first class meeting with a carefully considered business idea. Cross listed with MKTG 4780 and MGMT 4780 Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 4028 - Leadership and Entrepreneurship in Ireland

This 2-week course in Ireland provides students with an overview of key leadership principles for creating strategies and managing teams in new ventures in the US and abroad. This course provides the student with an overview of key leadership principles for creating strategy and managing teams in a new venture. It introduces leadership concepts critical to gaining true organizational commitment, and focuses on case studies relevant to common business issues. By exploring what entrepreneurial leaders actually do, and how they do it, the student will examine the principles of strategic planning, and how visionary leadership is required to develop an organization that is able to execute the

strategy through measurable goals and objectives. Cross-listed with INTB 4028 & 6028. Max hours: 3 Credits.

Semester Hours: 3 to 3

ENTP 4720 - Internet Marketing

Distinctly influences the way marketers conduct marketing activities. The Internet media promises to establish marketing theories, identifies obsolete situations, explores how marketing functions have irreversibly changed as a result of the internet, and outlines basic marketing strategies for successful online marketing. Prereq: MKTG 3000. Cross-listed with MKTG 4720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 4730 - New Product Development

The creation of new products is essential in today's business environment. It is conducive to organizational growth and long-term survival. This course addresses the new product development process in depth. It introduces students to key concepts and issues. It also provides a series of practices which will help students deliver higher value and be more competitive. Prereq: MKTG 3000. Cross-listed with MKTG 4730. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 4840 - Entrepreneurship Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENTP 4950 - Special Topics

A variety of topics in entrepreneurship are offered. Consult the current "Schedule Planner" for semester offerings. Prereq: Topics vary. Max hours: 9 Credits. **Semester Hours:** 0 to 3

ENTP 5939 - Internship/Cooperative Education.

Supervised experiences involving the application of concepts and skills in an employment situation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6020 - Business Model Development & Planning

Business plan development which incorporates all key ingredients necessary for various users. Includes the ins and outs of business plans for new ventures through environmental scans of new business opportunities, case studies, by sharing the experience of entrepreneurs and investors that have been through the process and by writing a business plan, either individually or with a team of other students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6021 - Corporate Entrepreneurship

This course considers innovation and new-business creation strategies from within an existing organization. It will explore various growth models intended to help organizations build their revenues in ways that are consistent with the business' Strategic orientation and constraints. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6028 - Leadership and Entrepreneurship In Ireland

This 2-week course in Ireland provides students with an overview of key leadership principles for creating strategies and managing teams in new ventures in the US and abroad. This course provides the student with an overview of key leadership principles for creating strategy and managing teams in a new venture. It introduces leadership concepts critical to gaining true organizational commitment, and focuses on case studies relevant to common business issues. By exploring what entrepreneurial leaders actually do, and how they do it, the student will examine the principles of strategic planning, and how visionary leadership is required to develop an organization that is able to execute the strategy through measurable goals and objectives. Cross-listed with INTB 4028 & 6028. Max hours: 3 Credits.

Semester Hours: 3 to 3

ENTP 6620 - New Venture Operations and Project Management

Introduces an operations model for developing internal and external operation plans for new ventures. Project management knowledge and skills are used to build operation plans. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6642 - Exploring Social Entrepreneurship

Study the people and organizations addressing pressing social and environmental issues facing society today. Understand and develop innovative models providing solutions to these issues. Apply theory to real situations via site visits, case studies and guest speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6644 - Social Entrepreneurship in the Developing World

Solving Developing World's challenges using creative and entrepreneurial approaches. New generation of leaders are not just interested in the bottom line, but they are looking at the triple bottom line: People, Profit and the Planet. They are changing the world. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6800 - Special Topics in Entrepreneurship

A variety of topics in entrepreneurship are offered. Consult the current 'schedule Planner' for semester offerings. Max hours: 15 Credits. **Semester Hours:** 3 to 3

ENTP 6801 - Building Biotechnology

Fundamentals of Life Science Technology and Entrepreneurship. Session topics include introduction to bioinnovation and entrepreneurship, tech transfer, accounting and finance basics, financing, opportunity assessment, legal and regulatory environments, clinical trials, project management, ethics and societal issues and team building. Cross-listed with IDPT 6301. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6802 - Regulatory Environment of Life Science Innovation

This course is designed to familiarize graduate level engineering, business, law and life science students with the

fundamentals of the life science technology commercialization including drugs, devices, diagnostics, healthcare IT and platform applications. Cross-listed with IDPT 7302. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6807 - Small Business Marketing and Personal Branding

Learn how to create successful marketing strategies in both Entrepreneurial and Intrapreneurial environments and personal branding. The course work will demonstrate the imperative link between marketing and personal branding through case studies, projects, guest speakers and reading materials. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6808 - Practicum in Sustainable Business Research

This course is an online practicum research course in sustainable business with online lectures, resources and video focused on an original research paper/case study. Students should have taken a course or have knowledge/experience in sustainable business management. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6822 - Legal and Ethical Issues of Entrepreneurship

This course addresses the legal issues most frequently encountered by entrepreneurs and others involved in start-ups and small, closely held or family businesses. The focus is on how to avoid legal problems and how best to cope when they arise. Topics include choice of business form, legal aspects of raising capital, taxation, intellectual property law, employment law, product liability, e-commerce and the problems of managing lawyers and litigation. Note: Cannot receive credit for both BUSN 6540 and this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6824 - Entrepreneurial Financial Management

Includes financial and legal aspects, financial reporting and cash flow analysis, financial planning, budgeting, working capital management, asset decisions, obtaining capital, business valuation, franchising, lease versus buy decisions, and financial aspects of international trade and different methods of obtaining capital.. Cannot receive credit for both FNCE 6460 and this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6826 - International Entrepreneurship

Provides the student with an overview of key trends and developments in international business. Familiarize the student with selected theories and concepts of international business and how it affects entrepreneurial functions, including finance, marketing, accounting, organization design and management. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6827 - Global Action Projects for Int'l Entrepreneurship

Students will have the opportunity to learn and apply key concepts in international entrepreneurship to live projects sponsored by entrepreneurial companies and/or entrepreneurial units within established firms. Students will work in small teams of about 6-8 students and will be supervised by a faculty and international mentors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6834 - Entrepreneurial Marketing

Designed to help students learn about best practices with recent lessons on Internet economy. Companies large and small face unique challenges successfully building a competitive advantage with limited marketing resources. Covers the analysis of marketing opportunities, identification of the targets, audience, and the development of a marketing strategy, brand positioning and an integrated marketing plan. Reviews product and service development processes. Provides a basis for establishing pricing and pricing plans. Assesses Internet economy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6838 - Real Estate for the Entrepreneur

This course will address issues critical to the success of any new venture location including business site selection and negotiation of real estate leases and purchases. General principles of real estate development, financing and urban planning, applicable to entrepreneurs, will also be discussed. Zoning, affordable housing, ADA issues, property management, real estate investing, historic preservation and selected taxation issues are also covered. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6840 - Independent Study: ENTP

Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENTP 6842 - New Concept Development

Understand business concepts, competitive offerings and potential customers' wants at their most fundamental level in this theory-driven course designed to help entrepreneurs assess the viability of new business concepts in potential markets. The course provides new ways of thinking about the attractiveness of industries and markets. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6846 - Marketing a New Business

The objective is to help entrepreneurs learn the latest techniques involved in taking a new business or service concept to market. It includes a theoretical analysis of how products diffuse, product life cycle issues, qualitative and quantitative research techniques (including exposure to an analytical software program), consumer behavior issues, strategic positioning given the nature of the product, the company and the external environment, promotion of the new concept and issues regarding the implementation of a marketing solution surrounding the new venture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6848 - Leadership in New Ventures

Provides the student with an overview of key leadership principles for creating strategy and managing teams in a new venture. It introduces leadership concepts critical to gaining true organizational commitment and focuses on case studies relevant to common business issues. By exploring what entrepreneurial leaders actually do and how visionary leadership is required to develop an organization that is able to execute the strategy through measurable goals and objectives. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6854 - Design & Manage Entrepreneurial Organizations

This course is about building, running and growing an entrepreneurial organization. It is about creating an organization that will sustain high performance over a long period of time and become a premier institution in its field. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENTP 6862 - Strategic Web Development

This course teaches students how to create a web presence that will support the purpose of the organization and help fuel the growth of the venture. The course covers the importance of website visibility to new business operations and the basics of designing and implementing web sites. It also covers how to utilize search engines, social networks, blogs and other online tools to support and promote your business. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 1042 - Introduction to Environmental Sciences

This laboratory or survey course develops a basic understanding of ecological relationships and environmental systems. Issues such as the effects of human activities on earth's environment, extinction or diversity, greenhouse effect, hazardous or toxic wastes and human population growth are discussed. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 4 to 4

ENVS 1342 - Environment, Society and Sustainability

Overview of perspectives on environmental issues within the context of sustainable development and taking a systems approach. The focus is on social science approaches to explore the human footprint on the earth, environmentalism, scientific uncertainty, policy creation and social change. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2. **Semester Hours:** 3 to 3

ENVS 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ENVS 3082 - Energy and the Environment

For students of various backgrounds who wish to increase their understanding of the environmental and technical issues of supplying the energy demands of our society. Alternative energy sources and conservation are explored as solutions to promote a sustainable society. Prereq: One course in college science or mathematics. Cross-listed with PHYS 3082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 3500 - Topics in Environmental Sciences

Note: Topics may vary from one offering to the next. **Semester Hours:** 1 to 6

ENVS 4210 - Mining and the Environment

Mineral resources such as metals have played an important role in human civilization. However, the extraction, processing, and use of metals have left a legacy of damage to the environment and human health. These impacts and their mitigation are examined. Prereq: One course in college mathematics or science. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 4500 - Topics In Environmental Sciences

Note: Topics may vary from one offering to the next. Prereq: Varies according to the topic. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENVS 4720 - Climate Change: Causes, Impacts and Solutions

Examines science behind past, present & future climate change & environmental, social & political implications & solutions. Explores recent scientific research, syntheses & mainstream literature advancing knowledge about causes & consequences of natural & anthropogenic climate change. Prereq: GEOG 3232. Cross-listed with GEOG 4720/ GEOG 5720/ ENVS 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 4840 - Independent Study: ENVS

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENVS 4850 - Understanding and Communicating Field Methods

Interdisciplinary course that presents a balanced overview of common field methods and how to communicate them effectively to a general audience. Includes hands-on experience with various field methods (e.g., transects, survey design, historical assessment, GIS, etc.) and communication strategies. Prereq: Introductory geography or environmental science course, and graduate or advanced upper-level standing, or instructor permission. Cross-listed with ENVS 5850 and GEOG 4850/5850. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENVS 4900 - Colloquium

Engages students and faculty in discussion of current and pertinent world topics, including specific readings, (guest) presentations, and creation of working research papers, among other items. Students and faculty may work in research groups to accomplish specific goals. Prereq: Advanced Standing (undergrad). Cross-listed with ENVS 5900, GEOG 4900 and 5900. Max hours: 4 Credits. **Semester Hours:** 1 to 1

ENVS 4992 - Advanced Regional Field Study

Directed, hands-on study of concepts involved in understanding geographic regions. Utilizes field observations, field techniques/methods, & data observation, collection, analysis, & interpretation related to the specific region being studied. May include physical as well as cultural phenomena. Note: Instructor permission required. Cross-listed with ENVS 5992, GEOG 4992, GEOG 5992. Max hours: 12 Credits. **Semester Hours:** 1 to 6

ENVS 4995 - Travel Study

Rigorous yet flexible fieldwork-based experience exploring geographical and environmental phenomena in diverse world locations. Course begins with intensive regional and methodological introductions, followed by on location field investigations in environmental analyses, cultural studies, GIS applications, tourism evaluation and/or hazards assessment. Prereq: GEOG 1202 and GEOG 1302, or permission of instructor. Cross-listed with ENVS 5995, GEOG 4995, and GEOG 5995. Max hours: 12 Credits. **Semester Hours:** 3 to 9

ENVS 4998 - Geography By Rail

Systematic and geographic exploration of region(s) mainly via train, focused on creating broad understanding of peoples, cultures, and landscapes. This course represents an intensive, field-based experience that may encompass both physical and cultural characteristics of place and space. Prereq: GEOG 1202 and 1302, or equivalent as determined by instructor. Cross-listed with ENVS 5998 and GEOG 4998/5998. Max hours: 12 Credits. **Semester Hours:** 1 to 12

ENVS 5010 - Landscape Geochemistry

A holistic approach to studying the role chemical elements play in synthesis/decomposition cycles, and the resultant environment from interaction of the lithosphere with the hydrosphere, atmosphere, biosphere, and pedosphere during geological, and ecological timeframes, together with anthropogenic activities. Prereq: Introductory college-level physical geography or environmental science course or permission of instructor. Cross-listed with GEOG 4010/GEOL 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5020 - Earth Environments and Human Impacts

Basic concepts describing earth's biomes and physical environment are presented in a systems context. Global warming assessment, from both political and scientific perspectives, is then presented. Model visualization of these concepts to consider human impacts on Earth's biomes is discussed. Earth system viewpoint, having links of Earth's biomes to oceans and atmosphere, completes the course discussion. Cross-listed with GEOG 4020, GEOL 4020. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5030 - Environmental Geology

Applies geological information to interactions between people and the physical environment. Increasing awareness of its importance in our society means that this is an expanding field as companies are required to address the environmental consequences of their actions. Prereq: Entry into MSES program, senior standing in sciences or geography, or permission of instructor. Cross-listed with GEOL 4030 and 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5280 - Environmental Hydrology

Examination of hydrologic processes in relation to climate, soils, vegetation, land-use practices, and human interactions. Natural scientific perspectives emphasized; field and laboratory included. Prereq: GEOG 1202 and one of: 1) GEOG 3232; 2) GEOG 4240/GEOL 4240/GEOG 5240; 3) GEOG 4010/GEOL 4010/ENVS 5000. Cross-listed with GEOG 4280 and GEOL 4280. Max hours: 4 Credits. **Semester Hours:** 4 to 4

ENVS 5340 - Equity & Culture in Science Education: Local/Global

This course examines literature in science education related to issues of culture and equity. Topics will be framed by an understanding of equity in diverse classrooms and how it informs research, curriculum and instruction. Cross-listed with SCED 5340. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5403 - Unsaturated Zone Hydrology

Focuses on water and contaminant transport through the unsaturated zone, infiltration and drainage, and heat and gas transport. Students learn to design, perform field installation, and collect data in order to model and predict contaminant movement on/off site. Prereq: Chemistry, physics, calculus or permission of instructor. Cross-listed with GEOL 4402. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5410 - Aquatic Chemistry

Course objectives are to: (1) identify and understand chemical and physical principles and processes that control the composition of natural water, (2) prepare students to critically evaluate scientific literature and experimental design related to water quality and environmental remediation, and (3) examine the validity of environmental water data. Prereq: Graduate status and general chemistry and/or CHEM 4700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5450 - Urban Food and Agriculture: Perspectives and Research

Provides an overview of research & practices in urban farming. Critically reviews emergent models of local food production/distribution. Compares new practices to traditional agribusiness. Assesses the prospects for solving sustainability problems within the modern agro-food system. Prerequisite GEOG 3401. Cross-list GEOG 4450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5460 - Sustainable Urban Agriculture Field Study I

Provides a field-based overview of urban farm planning & management. Topics: range/land conservation, native/invasive species, water distribution, animal husbandry, government interaction, local markets, community relations, conservation easements and issues pertaining to urban farming. Prerequisite ENVS 5450. Cross-list GEOG 4460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5470 - Sustainable Urban Agriculture Field Study II

Provides a field-based overview of current practices in local agricultural production. Emphasis will be placed on sustainable practices and their most efficient situation, Special consideration will be given to plausible solutions for

food insecure communities both local and global. Prerequisite ENVS 5450, 5460. Cross-list GEOG 4470. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5480 - Urban Vegetable CSA: Planning, Production&Distribution

This course outlines the planning, production, and distribution in an active urban vegetable CSA (community supported agriculture) model. It is offered as a part of the GES Sustainable Urban Agriculture Certificate. Cross-listed with GEOG 4480. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5500 - Topics in Environmental Sciences

Topics may vary from one offering to the next. Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 1 to 6

ENVS 5513 - Geology of the Grand Canyon

Raft down the Grand Canyon and examine the geology of igneous, sedimentary, and metamorphic rocks from the Precambrian to the Holocene. Study marine and terrestrial fossils, migmatization and observe modern sedimentary processes. Cross-listed: GEOL 4513. Prereq: Graduate standing. Max hours: 5 Credits. **Semester Hours:** 3 to 5

ENVS 5600 - Applied Statistics for the Natural Sciences

Surveys statistical techniques including: quick review of basic statistics, tests for normality and outliers, display of data; simple and multiple regression; ANOVA and its relation to regression. Emphasis on computer or stat-pak analysis and interpretation of statistical results. Prereq: College algebra and GEOG 3080, or consent of an instructor. Cross-listed with GEOG 4770, GEOL 4770, 5770. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5620 - Health Risk Communication

Acquaints students with contemporary theory, research, and practice in health risk communication. Cross-listed with COMM 5620/4620, HBSC 5620 and PBHL 4620. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5650 - Environmental Education

Theory and practice of conservation education, which include use of resource personnel and the study of curricular and instructional development. Field experiences are incorporated. Primarily oriented to elementary and junior high school. Cross-listed with SCED 5650. **Semester Hours:** 3 to 3

ENVS 5700 - Synthesis for Interdisciplinary Science

Synthesis is an approach in interdisciplinary research and education that links ideas, data and methods. This course develops synthesis skills through the lens of systems theory. It includes exercises for synthetic thinking, examination of

integrative tools, and a service-learning project. Cross-listed with GEOG 4700. Breadth and depth training in environmental sciences. Interest in interdisciplinary collaboration. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5720 - Climate Change: Causes, Impacts and Solutions

Examines science behind past, present & future climate change & environmental, social & political implications & solutions. Explores recent scientific research, syntheses & mainstream literature advancing knowledge about causes & consequences of natural & anthropogenic climate change. Cross-list GEOG 4720/ GEOG 5720/ ENVS 4720. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5730 - Air Quality Modeling and Analysis

Emphasizes the use of air dispersion modeling tools. Topics include: sources and effects of air pollution, use of the WWW, and analysis of modeling results. Note: For graduate students in environmental sciences or engineering, and for those working in the environmental field. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5731 - Mountain Biogeography

This course utilizes the close proximity of the Rocky Mountains to examine altitudinal influences on species distributions. Topics include species patterns and distributions, disturbance, climate impacts, forest management and sustainability. Prereq: GEOG 1202 or ENVS 1042 or graduate standing or permission from the instructor is required in order to register for this course. Cross-listed with GEOG 5731. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5840 - Independent Study: ENVS

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENVS 5850 - Understanding and Communicating Field Methods

Interdisciplinary course that presents a balanced overview of common field methods and how to communicate them effectively to a general audience. Includes hands-on experience with various field methods (e.g., transects, survey design, historical assessment, GIS, etc.) and communication strategies. Prereq: Introductory geography or environmental science course, and graduate or advanced upper-level standing, or instructor permission. Cross-listed with ENVS 4850 and GEOG 4850/5850. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ENVS 5900 - Colloquium

Engages students and faculty in discussion of current and pertinent world topics, including specific readings, (guest) presentations, and creation of working research papers, among other items. Students and faculty may work in research groups to accomplish specific goals. Prereq: Graduate standing. Cross-listed with ENVS 4900, GEOG 4900 and 5900. Max hours: 4 Credits. **Semester Hours:** 1 to 1

ENVS 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

ENVS 5992 - Advanced Regional Field Study

Directed, hands-on study of concepts involved in understanding geographic regions. Utilizes field observations, field techniques/methods, & data observation, collection, analysis, & interpretation related to the specific region being studied. May include physical as well as cultural phenomena. Cross-listed with ENVS 4992, GEOG 4992, GEOG 5992. Note: Instructor permission required. Max hours: 12 Credits. **Semester Hours:** 1 to 6

ENVS 5995 - Travel Study

Rigorous yet flexible fieldwork-based experience exploring geographical and environmental phenomena in diverse world locations. Course begins with intensive regional and methodological introductions, followed by on-location field investigations in environmental analyses, cultural studies, GIS applications, tourism evaluation and/or hazards assessment. Prereq: GEOG 1202 and GEOG 1302, or permission of instructor. Cross-listed with ENVS 4995, GEOG 4995, and GEOG 5995. Max hours: 12 Credits. **Semester Hours:** 3 to 9

ENVS 5998 - Geography By Rail

Systematic and geographic exploration of region(s) mainly via train, focused on creating broad understanding of peoples, cultures, and landscapes. This course represents an intensive, field-based experience that may encompass both physical and cultural characteristics of place and space. Prereq: GEOG 1202 and 1302, or equivalent as determined by instructor. Cross-listed with ENVS 4998 and GEOG 4998/5998. Max hours: 12 Credits. **Semester Hours:** 1 to 12

ENVS 6000 - Environmental Sciences Seminar

Student and faculty presentations of UCDHSC research projects and other current environmental sciences topics. All environmental sciences students are encouraged to attend, but credit is given only to students who present seminars. Two semesters of this course are required to receive a M.S. in Environmental Science degree: these students must register for this seminar and give presentations the first semester they are in the M.S.E.S. program and the semester in which they defend their master's project. Prereq: Graduate standing. Max hours: 2 Credits. **Semester Hours:** 1 to 1

ENVS 6002 - Research Topics in Environmental Sciences

Introduces research and professional development in the environmental sciences, focusing on current issues and trends in the field, methods of developing research and project proposals, and defense of a proposal written during the

semester. Students are introduced to the environmental sciences faculty and their research programs. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ENVS 6004 - Research Methods in Environmental Science

This core MS Environmental Science course will explore a range of methods commonly encountered in environmental science fields and how to develop a research project and proposal. Prereq: Must be graduate level and have completed ENVS 6002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 6100 - Research Topics in Environmental Management

This is one of 4 core MS Environmental Science courses that will review and apply the principles and methods involved in designing and implementing effective environmental management. Prereq: Must be graduate level and have completed ENVS 6002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 6200 - Risk Assessment

The process of determining the likelihood and extent of harm that may result from an activity or event. Topics covered are: hazard identification, dose-response evaluation, exposure assessment, and risk characterization. The subjects of risk management, risk perception, and risk communication are also discussed. Prereq: Graduate standing or permission of instructor. Cross-listed with CVEN 5494, HBSC 7340. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 6210 - Human Health and Environmental Pollution

Examines the roles of technology and society in the etiology and control/prevention of adverse health outcomes associated with releases of toxic substances. Examples come from experience and the literature on occupational cancer and reproductive hazards, occupational and environmental regulation of hazardous wastes, air, and water pollution. Cross-listed with HBSC 7210. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 6220 - Toxicology

Introduces the field of toxicology. Emphasizes the mechanisms by which chemicals produce toxic effects and the methods for assessing toxicity. Note: Designed for students in the environmental sciences and occupational health fields. Prereq: One year college chemistry and one year college biology. Cross-listed with HBSC 7360. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 6230 - Environmental Epidemiology

Provides a basic understanding of the methods used to study the effects on human health of exposures to physical, chemical, or biological factors in the external environment. The course explains the use of epidemiologic methods through a problem solving approach to investigating environmental health case studies. Prereq: A basic statistics course and graduate standing or permission of instructor. Cross-listed with HBSC 7310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ENVS 6800 - Community-Based Research Practicum

For students to apply the concepts and skills presented throughout the masters program in a community setting. Students will participate in a real-world, studio-based project that meets the needs of a government, non-governmental, or private sector organization and will produce a scoped product. Cross-listed with GEOG 6800. Max hours: 3 Credits. Prereq: Must be graduate level and have completed ENVS 6002, ENVS 6004 and ENVS 6100. **Semester Hours:** 3 to 3

ENVS 6840 - Independent Study: ENVS

Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 1 to 3

ENVS 6950 - Master's Thesis

Prereq: Graduate standing. Max hours: 11 Credits. **Semester Hours:** 1 to 6

ENVS 6960 - Master's Report

Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 6

ETST 2001 - Special Topics: Ethnic Studies

Topics vary from semester to semester, based upon interest and availability of Instructor in specialized areas. Max hours: 6 Credits. **Semester Hours:** 3 to 3

ETST 2010 - Introduction to Chicana/o Studies

This course introduces students to the broad range of the interdisciplinary field of Chicana/o Studies by examining the Chicana/o experience including history, identity, politics, immigration, labor, literature, and popular culture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ETST 3300 - Shamanic Traditions

Explores shamanic religious traditions across the world. This form of religion, involving spiritism, animism, trance states, and "mind power," is the oldest and most widespread religion in world history. Cross-listed with RLST 3300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 1060 - Camera/Multi-Media Production

In a lecture/lab setting, students will develop knowledge of equipment and skills in studio multi-camera production and the use of multi-media for live performances. Working together students will crew, produce and direct multi-camera studio and live productions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 2050 - Film/Video Prod/Post II

Students create productions using three-chip digital cameras and advanced techniques. Preproduction through post-productivity working with actors, and maximizing production values are stressed. Students employ a range of cinematic techniques to tell stories, convey character state of mind, and communicate information and meaning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 3100 - History of Film Production I

Surveys international film history from a production perspective from the origins of the medium to the development of sound. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 3150 - History of Film Production II

Surveys international film history from a production perspective, beginning with the introduction of sound to the present. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 3207 - Directing Workshop

Students work on scene studies rehearsed outside and presented in class. Emphasis is on capturing performance: working with actors and cameras to reveal character, deliver narrative and illuminate subtext. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 3300 - Advanced Lighting for Film and Video

Students master film and video set lighting techniques for studio and locations. Focus is on art, technology, methodology, exposure, instruments, rigging and terminology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 4400 - Advanced Screenwriting

This course focuses on creating and refining a feature length dramatic script (90-120 pages). Students will view films, read essays and articles, and analyze styles. They will apply these techniques and use this information to improve their own work. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 4600 - Topics in Film

Specialized topics in film and video. Max hours: 12 Credits. **Semester Hours:** 1 to 3

FILM 4720 - Reel Prep

Students will work with a faculty member to prepare a sample of the student's creative work and projects in an

"Industry standard" format used to secure employment. This work is referred to as an artists "Reel". Max hours: 1 Credit. **Semester Hours:** 1 to 1

FILM 5500 - Writing for Episodic Television

Explores the constructive and critical process of writing prime-time dramatic television. Each student is guided through a series of viewings, readings, and writing exercises culminating with the written completion of an episode from a current television series. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FILM 5600 - Topics in Film

Specialized topics in film and video. Max hours: 12 Credits. **Semester Hours:** 1 to 3

FILM 5840 - Independent Study: FILM

Max hours: 12 Credits. **Semester Hours:** 1 to 3

FINE 1001 - Introduction to Art

The course introduces visual analysis and critical examination of art from prehistory to modern times. Through reading, vocabulary development, group discussions, tests, and research projects, students will learn how to appreciate art and critically evaluate form, content, and context. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1. **Semester Hours:** 3 to 3

FINE 1100 - Drawing I

This course explores the act of drawing as a process of visual thought as an initial step to artistic expression. Students will develop an understanding of the basic principles of drawing as a way of learning to see. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

FINE 1120 - Digital Photography for Non-Majors

Students will learn fundamentals of digital photography through creative assignments that promote a broad understanding of the photographic medium. Topics include digital camera operation, sizing and resolution, principles of design, and interpreting photographic meaning. This course is designed for non-art majors. Restriction: Restricted to other schools and colleges and the following CAM Code Plans: MUSC-BS, RCDA-MS, TFTV-BFA, TFTV-BA. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1140 - Topics in Photography

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 1150 - Introduction to Darkroom Photography

Students learn traditional, film-based photographic practice. Topics such as camera functions, film processing, black and white darkroom printing, color theory and alternative darkroom techniques are explored through demonstrations, critiques, readings and discussions of historical and contemporary photography. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1400 - Two Dimensional Design

Focuses on the concepts and visual elements of all forms of two-dimensional art. Students gain an understanding of basic design principles as they analyze and visually articulate formal concerns in viewing contemporary and historical artworks as applied to studio problems. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1435 - Intro to Electronic Art and Design

A lecture/art-studio course for high school students that provides an introduction to the computer and its artistic and commercial possibilities. Through projects, lectures, discussions and readings, students explore techniques of production including digital photographic manipulation, sound editing, and web animation. Max hours: 2 Credits. **Semester Hours:** 2 to 2

FINE 1450 - Visual Culture: Ways of Seeing

A core course for majors and non-majors Visual Culture: Ways of Seeing explores how the meaning of imagery is encoded in cultural settings and transforms globally through changing technology and is integrated into daily life. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1. **Semester Hours:** 3 to 3

FINE 1500 - Three-Dimensional Design

Students explore the elements of art and the principles of design applied to three-dimensional design while developing an understanding of material properties, techniques, processes and tools. Creative practice is accompanied by written, theoretical and verbal critical thinking skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1810 - Digital Animation Foundations: Producing Animation

A lecture/lab course that explores the theory, practices and fundamentals of producing 3D animation. Students will explore the foundations of the animation process including the production pipeline, studio organizations, traditional animation techniques, foundational cinematography, storyboarding and character development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1812 - 3D Computer Graphics: Producing Animation

An online course that explores the theory, practices and fundamentals of the producing 3D animation. Students will explore the foundations of the animation process Note: Offered through Extended Studies. Must provide sufficiently powered computer. See www.cu3d.org Computer Graphics Certificate for details. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1820 - Digital Animation Foundations: Introduction to Digital 3D

A lecture/lab course that explores the foundations of creating digital 3D content. Primary focus is an introduction to current 3D software. Class lectures, demonstrations and hands-on application will expose the student to the expectations for commercial high-end 3D animation production. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 1822 - 3D Computer Graphics: Introduction to Digital 3D

An online course that explores the foundations of creating digital 3D content. Primary focus is an introduction to current 3D software. Note: Offered through Extended Studies. Must provide sufficiently powered computer. See www.cu3d.org Computer Graphics Certificate for details. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2010 - The Graphic Novel Workshop

This course introduces students to the visual language of the graphic novel through the creation of sequential imagery and page development. Students will delve into the pictorial methods found in both historical and contemporary comic books, Manga and alternative cartooning. Prereq: FINE 1100, 1400. FINE-BFA PIL, ILS, PIL, PND; FINE 1100, 1400, 2030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2030 - Life Drawing

This course introduces the student to the human figure, addressing anatomy, movement and proportion. Discussion of historic and contemporary critical methods supplement studio practice. Exploring a variety of drawing media, students expand their drawing skills and relate the principles of composition and design to figure drawing. Prereq: FINE 1100. Prereq: FINE-BFA PND or ILS or SMD; FINE 1100, 1400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2130 - Experiments in Color/Photography for Non-Majors

Explores both practical and innovative ways to manipulate color materials. Students gain technical mastery in understanding their cameras, using creative camera controls, color balancing film, and exposing color film while creating a portfolio of work that reveals experimental and innovative uses of color photographic materials. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2140 - Topics in Photography

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 2155 - Introduction to Digital Photography

Students learn digital image manipulation, input and output strategies, and digital camera functions through assignments that emphasize conceptual development. Presentations, readings, projects and class discussions help students gain an understanding of the role of digital imaging in contemporary photography. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2200 - Painting I

This course is an introduction to the language of painting. Students will learn to develop composition in layers, working from value to color and from direct observation to abstraction while exploring the range of visual possibilities that painting offers. Prereq: FINE 1100, 1400. Prereq: FINE-BFA PIL, ILS, PPD, PND: FINE 1100, 1400, 1500, 2155, 2600, 2610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2405 - Introduction to Digital Design

A project-based exploration of the design potentials of vector, raster and motion based digital media. Through project critiques, discussion and demonstration students will create projects that examine technology as an art medium and a design strategy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2415 - Typography Studio

A studio course that teaches principles of typography and organization that is the foundation of design and artistic practice. Through drawing, editing, and moving typographic forms, students will create projects that examine how typography is used to create meaning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2428 - Introduction to Scientific Media Design

Through lectures, writings, readings, and discussions students will be introduced to Scientific Media Design as a profession as well as the history and emerging directions in the field. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2500 - Bronze Casting

Students learn lost wax casting with ceramic shell investment and bonded sand. Modeling, foundry work, centrifugal casting and welding for cast metal are introduced, as is steel fabrication and mixed media. Individual vocabularies are explored and design skills acquired. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2510 - Wood and Metal Sculpture

Wood, metal fabrication and introduction of the found object are premise for the exploration of individual visual vocabularies. Investigation and design are applied towards developing conceptual ideas while students advance skills in the metal and wood studios. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2600 - Art History Survey I

A lecture course studying Western and non-Western art from prehistory to medieval times, including major artists and periods. Through visual analysis, vocabulary acquisition, exams, and writing assignments, students demonstrate knowledge of historical developments and an ability to analyze the arts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2610 - Art History Survey II

A lecture course studying Western and non-Western art from the Renaissance to today, including major artists and periods. Through visual analysis, vocabulary acquisition, exams, and writing assignments, students demonstrate knowledge of historical developments and an ability to analyze the arts. Prereq: FINE 2600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2810 - Digital Animation Techniques: Surface Modeling

A lecture/lab course focused on the mastery of creating surface models for digital 3D content. Students will develop skills/knowledge about the processes and techniques for building complex 3D objects with an emphasis on artistic excellence through application of current 3D technologies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2812 - 3D Computer Graphics: 3D Surface Modeling

An online course focused on mastery of creating surface models for digital 3D content. Students will develop skills/knowledge about the processes and techniques for building complex 3D objects. Note: Offered through Extended Studies. Must provide sufficiently powered computer. See www.cu3d.org Computer Graphics Certificate for details. Prereq: FINE 1810 or 1812 and 1820 or 1822. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2820 - Digital Animation Techniques: Surface Properties

A lecture/lab course focused on mastery of creating surface textures/materials for digital 3D content. Students will develop skills/knowledge about the processes and techniques for creating realistic 3D textures/materials with an emphasis on artistic excellence through application of current 3D technologies. Note: Offered through Extended Studies (Continuing and Professional Education) due to separate tuition structure. Acceptance to the Digital Animation Center is competitive by interview/portfolio review with the Area Head for the program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2822 - 3D Computer Graphics: 3D Surface Properties

An online course focused on mastery of creating surface textures for digital 3D content. Students will develop skills/knowledge about the processes and techniques for creating realistic 3D textures/materials. Offered through Extended Studies. Must provide sufficiently powered computer. See www.cu3d.org Computer Graphics Certificate. Prereq: FINE 1810 or 1812 and 1820 or 1822. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2830 - Digital Animation Techniques: Lighting

A lecture/lab course focused on mastery of lighting the digital 3D environment. Students will develop skills/knowledge

about the processes and techniques for creating realistic 3D lighting/lighting effects with an emphasis on artistic excellence through application of current 3D technologies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2832 - 3D Computer Graphics: 3D Lighting and Rendering

An online course focused on mastery of lighting the digital 3D environment. Students will develop skills/knowledge about the processes and techniques for creating realistic 3D lighting. Note: Offered through Extended Studies. Must provide sufficiently powered computer. See www.cu3d.org Computer Graphics Certificate for details. Prereq: FINE 2812 and 2822. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2850 - Digital Animation Techniques: 3D Character Creation

A lecture/lab course focused on mastery of skills for creating digital 3D characters. Students will develop skills/knowledge to shape, mold, transform/articulate, deform digital 3D shapes creating digital characters with an emphasis on artistic excellence through application of current 3D technologies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2852 - 3D Computer Graphics: 3D Character Creation

An online course focused on mastery of skills for creating digital 3D characters. Students will develop skills/knowledge to create digital characters. Note: Offered through Extended Studies. Must provide sufficiently powered computer. See www.cu3d.org Computer Graphics Certificate for details. Prereq: FINE 2812 and 2822. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 2995 - Travel Study

Created for students doing travel study in a foreign country. Students register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

FINE 3001 - Illustration I: Digital Media

This course focuses on digital mixed media and design thinking in the creation of illustrations within design constraints established by the client rather than the artist. Students learn methods for design thinking, critical assessment and refinement of illustration processes. Prereq: FINE 1100, 1400, 1500, 2155, 2600, 2610, and 2405. Restriction: Restricted to FINE-BFA ILS majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3002 - Illustration II: Spatial Thinking

Spatial Thinking focuses on the visualization of three-dimensional subjects in pictorial space. Theoretical and historical concepts of linear and optical perspective are examined; projects cover traditional and modernist approaches to creating the illusion of space. Prereq: FINE 3001. Restriction: Restricted to FINE-BFA ILS majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3030 - The Media of Drawing

This course introduces students to the notion of drawing from life through an exploration of drawing methods/materials in the creation of artist's books- including learning various binding techniques and studying movement and juxtaposition as we draw in and from these books. Prereq: FINE 1100 Prereq: FINE-BFA PND, ILS: FINE 1100, 1400, 1500, 2155, 2600, 2610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3040 - Color Theory: Studio and Screen-Based Practice

This hybrid course delves into how color is essential to traditional studio-based and digital media artists through focusing on visual color and light perception, color mixing with pigment and digital applications, and the interaction of color. Prereq: FINE 1100, 1400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3050 - Figure Painting

This course is an exploration of representing the human form in pictorial space. Students will gain a knowledge of figural color, proportion, scale and space; and will understand the conceptual and visual weight carried by expressive gesture and figural form. Prereq: FINE 2030 and FINE 2200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3110 - Imaging and Identity

A lecture course that analyzes representations of cultural diversity within the arts. Through visual analysis, vocabulary acquisition, discussion, exams, and writing assignments, students will demonstrate knowledge of historical developments and an ability to pursue critical thinking when interpreting imagery. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3115 - Mixed Media and Photography

Students create artwork using techniques that combine photography and mixed media. Topics include expanding the photograph to a 3-dimensional form, working with light-sensitive materials, and manipulating the print surface. Students develop creative concepts that are enhanced by cross-disciplinary methods. Prereq: FINE 2155. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3120 - Visual Culture Studies

A lecture course about visual culture, theory, and literacy since the Industrial Revolution. Through visual analysis, vocabulary acquisition, discussion, exams, and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze imagery. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 3130 - Photography, Optics and Perspectives in Italy

In this study abroad seminar course, students develop an understanding of their work within the context of the history of art and photography, particularly the artistic and scientific breakthroughs of the Renaissance, by exposing them to

strategies and theories exemplified by the remarkably diverse and historically significant artwork that is available in collections in Florence, Italy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3135 - Historic Photographic Processes in Italy

Investigates the relationship between critical concepts and alternative photographic processes in the unique cultural and artistic setting of Florence, Italy. Students create images using historic photographic methods such as salted paper, P.O.P., albumen, photo-polymer gravure and bromoil. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3160 - Color and Studio Lighting

Students explore traditional color photography, lighting techniques, concept development, and expressive uses of the medium. Topics include chromogenic printing, color theory, 4x5 technique and studio lighting. Students gain insight into the creative impact of color on photographic representation. Spring only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3161 - The Silver Fine Print

Students learn advanced black and white darkroom techniques while translating ideas into photographic form. Techniques include the zone system, split filter printing, toning, montage printing, and film/paper choices. Students gain insight into photographic artists, techniques, and movements. Restriction: Restricted to plan codes: FINE-BFA PHO, FINE- BA STU, FINE PHTO-MIN. Prereq: FINE-BFA PHO: FINE 1500, FINE 2610, FINE 3160. Prereq: FINE-BA STU: FINE 1100, FINE 1150, FINE 1400, FINE 1500, FINE 2155, FINE 2600, FINE 2610. Prereq: FINE PHTO-MIN: FINE 1150, FINE 2155. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3162 - The Digital Fine Print

Students learn the fine art of digital printing as it relates to photographic practice and theory. Assignments focus on conceptual development, advanced image manipulation, workflow, color management, and digital ink jet printing. Students gain insight into the role of digital imaging in contemporary culture. Restriction: Restricted to plan codes FINE-BFA PHO, FINE- BA STU, FINE PHTO-MIN. Prereq: FINE-BFA PHO: FINE 1500, FINE 2610, FINE 3160. Prereq: FINE-BA STU: FINE 1100, FINE 1150, FINE 1400, FINE 1500, FINE 2155, FINE 2600, FINE 2610. Prereq: FINE PHTO-MIN: FINE 1150, FINE 2155. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3171 - Concepts and Processes in Photography

Students develop skills in alternative photographic techniques. Processes covered include camera-less and pinhole photography, reticulation, non-silver printing, liquid emulsions, digital/traditional cross-manipulation. Students gain insights into the relationship between ideas and experimental ways of creating images. Spring only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3172 - Digital Bookmaking

Students create handmade artists books using digital technologies. Projects build skills in idea development, use of text

and image, digital image manipulation, digital printing, scanning and bookbinding. Students learn strategies for creating visual narratives through photography. Spring only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3175 - Commercial Applications

Students learn how photographers apply creative, technical and conceptual skills to commercial photographic practice. Topics covered may include editorial strategies; studio or location photography; commercial business practices; advertising photography; shooting and lighting techniques; and professional presentation. Prereq: FINE 2155. Prereq for FINE-BFA PHO: FINE 1500, FINE 2610, FINE 3160. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3200 - Intermediate Painting and Drawing I

In this course students develop a body of work that expands on previous course work, to make the transition from assignment-based work to an independent body of work, and to prepare for advanced level study in painting and drawing. Prereq: FINE-BFA PND: FINE 2030 and 2200. Restriction: Restricted to FINE-BFA PND majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3210 - Intermediate Painting and Drawing II

In this course students continue to develop a body of work begun in Intermediate I, making the transition from assignment-based work to an independent body of work. Students are prepared in Intermediate II for advanced study in painting and drawing. Prereq: FINE-BFA PND: FINE 3200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3240 - Abstract Painting and Drawing

This course explores the methods of abstraction as applied to painting and drawing. Through developing a body of paintings and drawings, students will gain an understanding of complex formal structures in the development of their work. Prereq: FINE 2200. Prereq: FINE-BFA PND: FINE 2030 and 2200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3250 - Sculpture: Contemporary Artists and Concepts

Provides the art student (sculpture majors and non- majors) with a focused opportunity to look at contemporary sculpture, installation and performance art and to examine the philosophical issues, processes and methods motivating practicing artists today. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3260 - Portraiture

This is an advanced course in portraiture using both drawing and painting media. Working from observation and focusing on the anatomical structure, the artist will gain a greater command in portraying complex expressions of the human face. Prereq: FINE-BFA ILS: 3001. Restriction: Restricted to FINE-BFA ILS majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3300 - Painting, Drawing and the Printed Image

This course explores the role of technology in the history of painting/drawing alongside studio practice. Students produce works that explore personal symbolism through the combination of graphically printed and hand-produce marks while utilizing technology as a tool in painting/drawing. Prereq: FINE 1100 Prereq: FINE-BFA ILS, PND: FINE 1100, 1400, 1500, 2155, 2600, 2610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3340 - Topics in Studio Art

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 3342 - Topics in Studio Art

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 3343 - Topics in Studio Art

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 3350 - Topics in Multimedia

Specialized topics are offered in new multimedia technologies, theories, processes and conceptual thinking. Course titles are unique and changing semester to semester. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3400 - Introduction to Web Design and Digital Imaging

A studio course for non-design-majors that explores the design and creation of web sites for personal and professional use. Through critiques, discussion and research, students learn the basics of digital imaging and illustration as well as principles of user-interface design. Note: class may not be taken by Digital Design majors for credit toward degree. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3405 - Introduction to Digital Video

A studio course for non-design-majors that focuses on the basics of storytelling using digital video. Through class projects, screenings, discussions and readings, students explore the concepts of montage and strategies to develop compelling video for artistic and commercial purposes. Note: class may not be taken by Digital Design or Transmedia majors for credit toward degree. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3414 - Motion Design I

A course devoted to understanding time based imagery that focuses on utilizing video and motion graphics as a creative communication tool. Students create projects that explore topics using video, animation, time and motion using a non-linear digital editing software. Restriction: Restricted to FINE-BFA DIG or DIGD-MIN or FINE-BFA 3D ANI. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3415 - Design Studio I

In a design laboratory students learn to turn ideas into visual solutions through the application of design principles. Through lectures, writings, readings, discussion and critiques of projects assigned students will build visual literacy in relation to digital design. Restriction: Restricted to FINE-BFA DIG or DIGD-MIN. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3417 - Design Research

This seminar class examines methods and processes used by designers to better understand the content they are asked to communicate while addressing increasingly complex social, technological and economic problems. Class topics will include: user interface and experience design, demographics, storyboarding, branding, and concept mapping. Restriction: Restricted to FINE-BFA DIG or DIGD-MIN. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3424 - Interactive Media

A course exploring how interactive media can be used to convey a message and deliver information. Through critiques, discussion and research, students will learn principles of user interface design, aesthetics and structure including their potential cultural impact. Restriction: Restricted to FINE-BFA DIG or DIGD-MIN. Prereq: FINE 3414, 3415, 3417; DIGD-MIN and FINE 3414, 3415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3434 - 3D Motion Design

A course devoted to 3D as a medium for creating works of art. Through demonstration, discussion, readings and project based explorations, students will learn to navigate and create in the 3D digital environment. Restrictions: Restricted to FINE-BFA DIG or DIGD MIN. Prereq: FINE 3444, 3464. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3438 - Text, Image and Electronic Art

A workshop-laboratory devoted to examining advanced concepts concerning the role of image and text within time-based and interactive media in design/artistic practices. Through creative investigations, readings and discussion students consider the new and expanding roles of text and image within the electronic sphere. Note: priority is given to Digital Design and Transmedia majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3444 - Interactive Media II

An intense course devoted to using interactivity as a medium for communicating ideas and information. Through creative investigations, readings and discussions, students will create projects that explore active viewer participation using vector/ raster animation, non-linear editing and viewer interaction. Restriction: Restricted to FINE-BFA DIG. Prereq: FINE 3424, 3454. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3450 - Digital Painting

Digital Painting is a studio designed for student exploration of artistic expression using digital tools for traditional painting and illustration techniques. Prereq: FINE-BFA ILS, PND, PNT, or DRW: FINE 2030, 2405. Prereq: FINE 1100, 1400, 2405. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3454 - Motion Design II

An intense course devoted to using time and motion as a medium for communicating ideas and information. Through creative investigations, readings and discussions students explore linkages between non-linear editing, animation and 3-dimensional animation as used in motion graphics. Restriction: Restricted to FINE-BFA DIG. Prereq: FINE 3414, 3415, 3417. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3464 - Design Studio II

In a studio environment students will develop advanced projects using animation, interactivity and motion graphics to create innovative solutions to design problems. Students will learn to apply design theory to practice through discussion, critiques and assigned projects. Restriction: Restricted to FINE-BFA DIG. Prereq: FINE 3424, 3454. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3474 - Narrative and Experience

A workshop-laboratory that focuses on narrative structure and its ability to create, control and manipulate viewer and user-experience. Through creative explorations, students will examine issues of identity, reception and audience and develop approaches to creating user-centered works of art/design. Restriction: Restricted to FINE-BFA DIG. Prereq: FINE 3444, 3464. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3500 - Installation Art

Students learn to modify the way a particular space is experienced through material intervention in everyday public or private spaces. Material use ranges from everyday and natural materials to new media such as video, sound, performance, computers and the Internet. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3505 - Environmental Art

Students create site-specific work to exist in a certain place or describe a specific location. This involves temporary outdoor landscaping combined with sited sculptural elements and gallery exhibition. The formal, political, historical, public, ecological, geographical and social context of the urban/rural environment will be explored. Max hours: 9 Credits. **Semester Hours:** 3 to 3

FINE 3510 - Mold Design & Casting

Mold design and construction using rubber, alginate and plaster is introduced for casting in metal, resin, synthetics, concrete, plastic, paper and biodegradable materials. Drawing is included. Exploration of life size and small-scale castings. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3515 - Public Art

Students connect with professional/visiting artists installing public art works on campus for the Auraria Sculpture Park. Public relations, installation techniques, curatorial and administration skills are developed. Students learn to establish, maintain and promote the current sculpture collection on campus. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3520 - Sculpture: Contemporary Artists and Concepts

Provides the art student (sculpture majors and non-majors) with a focused opportunity to look at contemporary sculpture, installation and performance art, and to examine the philosophical issues, processes, and methods, motivating practicing artists today. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3525 - Modeling for Manufacture

The course will focus on contemporary professional practices and will cover topics such as project planning, an introduction to computer-aided design, fabrication, and outsourcing for the production of sculptural works. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3530 - Electronic Art

Video, sound and projection in contemporary sculpture. Introduction to sensors and motors and data visualization. A bridge between the digital laboratory and the sculpture studio in the context of object making, gallery and networked media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3535 - Sculpture Rendering

Students apply traditional and mixed media drawing skills, photography and digital reproduction to depict the sculptural object in two and three-dimensional space. Students learn to construct small-scale models and develop sculpture proposals. Drawing as sculpture medium is explored. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3550 - Iron Casting

Students learn traditional and innovative mold making techniques for casting iron. Casting techniques include working with found objects, lost wax, ceramic shell and sand molds. Furnace design and equipment fabrication are researched. Public performance is integral to the class. **Semester Hours:** 3 to 3

FINE 3630 - History of Photography

Students examine the history of photography from its origins to the present. Emphasis is placed on photography as an artistic medium. Topics covered include important movements, photographers, and technical innovations, as well as photographer's broader role in visual culture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3631 - Photography: Theory and Criticism

Students investigate the historical texts of photographic criticism. Readings relate to photography as a fine art form, concentrating on 1970 to the present. Through discussions, readings and critical writing, students examine and appreciate the significance of photographic theory. Spring only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3635 - Photography Now

Students investigate trends in fine art photography from 1990 through the present. By examining current topics, styles, and techniques students gain insights into contemporary photographic practice and its relationship to the history and future of the medium. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3640 - Topics in Art History I: Art Before Modernism

Variable: Art History lecture course pertaining to art before Modernism. Max hours: 6 Credits. **Semester Hours:** 1 to 3

FINE 3644 - Topics in Art History II: Modern and Contemporary

Variable: Art History lecture course pertaining to art since Modernism. Max hours: 6 Credits. **Semester Hours:** 1 to 3

FINE 3810 - Digital Animation Studio: Set/Environment Design

A mid-program capstone studio course focuses on developing a project from preproduction through final product using a standard production pipeline model within a collaborative work environment. Students will design and create high-production value CG set/environment utilizing current 3D technologies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3815 - Storyboarding for Cinema and Game Previsualization

A lecture/lab course covering the foundations of the cinematic storyboarding process/techniques used for previsualization in the film, entertainment design and game industries. Students will develop skills/ knowledge for creating storyboards study and understand film theory, storytelling, film language and grammar, and filmic composition. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3820 - Digital Animation Technique: Char. Rigging Animation I

A studio course focused on foundational skills for animating digital 3D objects/characters. Students explore the process/techniques of key frame/pose-to-pose animating considering character performance, thought, constraints and velocity with an emphasis on artistic excellence through applications of current 3D technologies. Restrictions: Restricted to Visual Arts majors with an emphasis in 3D Animation within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3821 - Digital Animation Technique: VFX Rigging Animation I

A studio course focused on foundational skills for animating and rigging full digital 3D characters and objects. Students

explore the process/techniques of rigging for motion capture characters and adjusting their performance with consideration for thought, and animation with an emphasis on realistic VFX driven character performance. Restrictions: Restricted to Visual Arts majors with an emphasis in 3D Animation within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3830 - Digital Animation Technique: Char Rigging&Animation II

A studio course focused on mastery of skills for rigging and animating digital 3D characters. Students explore the processes/techniques of animation rigging and its relationship to animating character performances. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3831 - Digital Animation Technique: VFX Rigging Animation II

A studio course focused on mastery of skills for rigging and animating digital 3D characters and objects and advance motion capture techniques. Students explore the processes/techniques of animation rigging and its relationship to realistic simulation of dynamic objects. Restrictions: Restricted to Visual Arts majors with an emphasis in 3D Animation within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3835 - Procedural Workflows for 3D Animation

A lecture/lab course covering the procedural workflow methods for developing art for 3D animation, dynamics, VFX and motion graphics. Students will develop skills/ knowledge about the techniques for creating procedural 3D models, simulations, texturing, lighting, and rendering in FX Houdini. Intermediate computer skills required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3845 - Digital Animation: Short Film Preproduction, Story

A seminar course focused on the story development/preproduction phases for the DAC senior thesis short. The principle focus of the course will be story development, preproduction activities and organizing the production team and production pipeline for the thesis short. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3846 - Digital Animation: Short Film Preproduction: Look Dev

A seminar course focused on the development and preproduction phases for the DAC senior thesis short. The principle focus of the course will be look, lighting, effects, and pipeline development and production organization for the DAC thesis short film. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3850 - Digital Animation Techniques: Dynamic Simulation

A lecture/lab course exploring the theory/techniques of dynamic and particle simulations for 3D content. Students explore how to develop effects (smoke, fire, steam, explosions) and dynamic materials (cloth), with an emphasis on artistic excellence through application of current 3D technologies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Max hours: 12 Credits. **Semester Hours:** 1 to 3

FINE 3995 - Travel Study

Created for students doing travel study in a foreign country. Students register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

FINE 4001 - Illustration III: Conceptual Methods

Illustration III is a conceptual illustration studio course that focuses students on assigned problems with constraints. Design-thinking methods and research are used to communicate a concept and discover the potentials of illustration media from plastic to digital. Prereq: FINE-BFA ILS: FINE 3001, FINE 3002. Restriction: Restricted to FINE-BFA ILS majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4002 - Illustration IV: Professional Practice

In preparation for BFA Thesis, students refine their visual voice within a marketplace context. Students learn essential illustration marketing and business practices in order to develop a portfolio for a particular market or gallery setting. Prereq: FINE-BFA-ILS: FINE 4001. Restriction: Restricted to FINE-BFA ILS majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4003 - Illustration V: BFA Thesis

Illustration V is a capstone studio course and the culmination of the Illustration program leading up to the BFA Thesis exhibition. Students focus on the development of individual style and the refinement of a professional portfolio. Prereq: FINE-BFA ILS: FINE 4002. Restriction: Restricted to FINE-BFA ILS majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4020 - Anatomy for the Artist

An intensive study of the human figure, focusing on its structure, movement and proportions. Skeletal and muscular systems are explored in depth using the classic texts of artistic anatomy to enhance students' drawings from observation. Prereq: FINE 2030. Restriction: Restricted to FINE-BFA majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4050 - Design in a Global Workplace

Through intensive participatory workshops, study tours, and lectures this class examines the advantages of interdisciplinary community-based collaboration. This class also examines the complexities of cross discipline collaborations including multiple professional agendas, political and business establishments and the needs of the community. Max hours: 6 Credits. **Semester Hours:** 3 to 6

FINE 4100 - Painting & Drawing Theory & Practice

This course focuses on a study of critical art theory from 1900 to now and its effects on art practice. Students read, research, discuss writing, and produce artwork while forming connections between published critical theory and their own creative ideas. Note: Students missing the first 2 classes of this course may be administratively dropped. Students will not be allowed to add course if they have missed the first 2 classes. Prereq: FINE-BFA: FINE 4990. Prereq: FINE-BFA PND: FINE 3200, FINE 4990. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4140 - Topics in Photography

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 4195 - Advanced Photography I

Students create an independent body of photographic work that integrates sophisticated concepts with technical mastery. Through critiques, presentations and discussions, students relate subject matter to historical and contemporary context. Students build expertise in the area of professional development in photography. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4196 - Advanced Photography II

Students create an independent body of photographic work that integrates sophisticated concepts with technical mastery. Through critiques, presentations and discussions, students relate subject matter to historical and contemporary context. Students build expertise in the area of professional development in photography. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4200 - Advanced Painting and Drawing I

This is the first level of advanced studies in painting/drawing where students create a body of work that expresses a more complex individual vision. Students learn to develop their artistic practice with self-directed processes in support of focused concepts. Prereq: FINE 3210. Prereq: FINE-BFA PND: FINE 3030, 3050, 3210, 3240, and 3300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4210 - Advanced Painting/Drawing II

This is the second level of advanced studies in painting/drawing in which students expand and refine their body of creative work in preparation for the BFA Thesis Exhibition and advance their artistic practice by articulating their sources, processes and concepts. Prereq: FINE 3210. Prereq: FINE-BFA PND: FINE 3030, 3050, 3210, 3240, and 3300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4340 - Topics in Studio Art

Max hours: 12 Credits. **Semester Hours:** 1 to 3

FINE 4350 - Topics in Digital Design

Specialized topics are offered in new design technologies, theories, processes and conceptual thinking. Course subjects are unique and changing semester to semester. Max hours: 6 Credits. **Semester Hours:** 1 to 3

FINE 4400 - Design Studio III

Set up as a collaborative studio, students learn to identify problems in the cultural and urban environment and design solutions that address those problems. Through discovery and research students will learn how design can be a catalyst for change. Restriction: Restricted to FINE-BFA DIG. Prereqs: FINE 3434, 3474. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4420 - Interactive Media III

An advanced interactive design workshop where students will use current industry tools to explore a range of topics such as emerging technologies, design interactive prototypes, physical computing, application design, experimental game design. Students will end the semester with a finished mobile or desktop application. Restriction: Restricted to FINE-BFA DIG. Prereq: FINE 3434, 3474. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4425 - Motion III

An intense workshop-laboratory devoted to advanced motion design techniques. Through creative investigation, the study of motion theory and hierarchy, compositing, filming techniques, broadcast parameters, aesthetics, typography and technical issues students will develop the in-depth knowledge necessary to excel as design professionals. Restriction: Restricted to FINE-BFA DIG. Prereq: FINE 3434, 3474. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4434 - Virtual Landscapes

In a studio environment students will explore place in relation to contemporary digital art practice. Through readings, lectures and production of projects assigned, students will create work that addresses the natural, urban and virtual environment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4446 - Visualization & Infographics

In our data and information-rich society, visual representations of data can be useful for making sense of available information and fostering understanding. This course engages students in critique existing work and encourages a thoughtful design process toward creation of information graphics and simple data/information visualizations. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 4447 - Presenting Science

Sophisticated graphical components can help a viewing audience understand complex scientific information more clearly. This project-based learning course engages students in creation of thoughtful graphic explanations of science

for the purpose of enhancing scientific presentations and audience comprehension. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4448 - BioMedical 3D Animation

3D Animation can be a powerful tool for telling stories rooted in science and medicine. This course provides opportunity to learn from existing animated works while honing skills in storyboarding, narrative and 3D animation with focus on biology, science, and health education. SMD students explore and research BFA thesis topics. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 4450 - Social Engagement by Design

Through lectures, discussions and conducting onsite research in international settings, students will become familiar with professional practitioners' Perspectives and experiences in the field of socially engaged design while interrogating current practices, policies, and expectations that inform community engagement and by Design. Max hours: 6 Credits. **Semester Hours:** 3 to 6

FINE 4480 - The Practice of Design

Through lectures, studio visits and research, students will engage the profession and examine the role of the artist as a designer. Projects will focus on resumes, interview techniques, portfolio and business practices to prepare students for entering the design profession. Restriction: Restricted to FINE-BFA DIG Prereq: FINE 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4495 - Design Studio IV: Thesis

Through critique, research, and writing students will critically explore a thesis topic and develop professional quality visual solutions. Students will create work that expresses their personal artistic vision in relation to significant contemporary and historical artists and practice. Restriction: Restricted to FINE-BFA DIG Prereq: FINE 4480 Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4500 - Electronic Performance

Digital and live performance. The investigation of "Live Media", screen based non-local performance, and social/networked media in conjunction with live viewer engaged performance. Examination of social, political and personal concerns through conceptual idea, time, space, and a relationship between performer and audience. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4505 - Sculptural Rendering

The refinement of personal ideology and practice with traditional or electronic/digital techniques. Each individual problem solves to determine the conceptual basis of their art making in preparation for BFA Thesis and Advanced Sculpture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4510 - Advanced Sculpture

Individual decision-making is stressed in developing a strong body of work. Competent technical skills and conceptual ideology are expanded to achieve complete visual experiences and development of conceptual ideas. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4520 - Performance/Installation in Fine Art

Individual and collaborative projects, pieces, and events that develop one's attitudes, trust, and abilities to express through the awareness of space, environment, and the human condition and body. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4522 - Interdisciplinary Art in Ireland

The interdisciplinary course introduces students to the methods and concepts of contemporary site-specific art as critical theory through lecture and critique and as practice in the rural/urban landscape and studio along Ireland's County Clare coastline in the Burren region. Max hours: 6 Credits. **Semester Hours:** 6 to 6

FINE 4523 - Topics in Art History I: Art Before Modernism

Variable: Art History lecture course pertaining to art before Modernism. Max hours: 6 Credits. **Semester Hours:** 1 to 3

FINE 4524 - Topics in Art History II: Modern and Contemporary Art

Variable: Art History lecture course pertaining to art since Modernism. Prereq: FINE 2610. Max hours: 6 Credits. **Semester Hours:** 1 to 3

FINE 4525 - Museum Studies

A seminar about museums and art galleries as institutions for the preservation and exhibition of cultural materials. Through writing assignments, discussions, site visits, and analysis, students will demonstrate knowledge and critical thinking on the display of art. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 4600 - History of Modern Design:Industrial Revolution-Present

A lecture course involving the history of design from the Industrial Revolution to the present. The course will address the graphic design, typography, architecture, "Decorative arts", and new media from each period/major design movement in that time frame. Prereq: FINE 2610 for FINE-BA and FINE-BFA majors ONLY. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4610 - Pre-Columbian Art

A lecture course on the art and architecture of Mesoamerica and the Andes before the Spanish conquest. Through visual analysis, vocabulary acquisition, discussion, exams, and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Cross-listed with FINE 5610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4620 - American Art

A lecture course on the art of the United States from colonial times to World War II. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Prereq: FINE 2610 for FINE-BA and FINE-BFA majors ONLY. All others may enroll without prereq requirements. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4625 - Studio Creative Process

Provides students with an understanding of the artistic creative process which is learned through an examination of pre-studio, studio and post-studio practices. Prereq: Must have at least two art history survey courses. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 4630 - History of Latin American Art:1520-1820

A lecture course studying Latin American art of 1520-1820, including major artists and periods. Through visual analysis, vocabulary acquisition, exams, and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the arts. Prereq: FINE 2610. Cross-listed with FINE 5630. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4632 - Media History and Aesthetics

This survey class will present the current and historic impact of media technology on the arts and professional design practice. Through lectures, research and discussion students will become familiar with issues specific to digital media and design. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4670 - Greek and Roman Art

A lecture course on art and architecture from ancient Greece and Rome. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4680 - Art of the Middle Ages

A lecture course on western European art and architecture from the fourth to the fourteenth centuries. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Prereq: FINE 2610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4700 - Italian Renaissance Art

A lecture course about developments in Italian Renaissance art and architecture. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4705 - Northern Renaissance Art

A lecture course about developments in Northern Renaissance art and architecture. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4710 - Baroque and Rococo Art

A lecture course on Italy, Spain, France, England, and the Netherlands during the seventeenth and eighteenth centuries. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4712 - Applied Digital Media

This lab course provides students with the opportunity to execute practical applications in the use of digital 3D media for commercial and/or non-profit venue. Max hours: 3 Credits. **Semester Hours:** 1 to 3

FINE 4730 - Arts of Japan

A lecture course on selected themes and periods in Japanese art. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4750 - Arts of China

A lecture course on selected themes and periods in the arts and architecture of China. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4770 - Art of India and Southeast Asia

A lecture course on selected themes and periods in the arts of India and Southeast Asia. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4790 - Methods in Art History

A seminar about the various research methodologies in the history of art. Through reading, discussion, research, writing assignments, and presentations, students will demonstrate knowledge of art historiography. Prereq: ENGL 2070 for FINE-BA majors ONLY. FINE 2610 for FINE-BFA majors ONLY. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4810 - Digital Animation Studio: Animation Production I

First semester of a yearlong capstone focuses on production of the BFA thesis short. As a team, students assume key management/production roles to organize, produce and complete a high-production value animated short and student "demo reel" with real-world production pipeline. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4820 - Digital Animation: Production II

The second in the capstone series continues the production of the BFA thesis short. Led by faculty in the roles of Producer, Director, and Technical Director(s), students produce and complete a high-production value animated short film based on provided content. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4825 - Architectural Visualization

A lecture/lab course covering the 3D visualization of architectural projects. Students will develop skills/ knowledge about the techniques for creating realistic 3D models, texturing, lighting, and presentation. Special emphasis will be placed creating realism in modeling, materials, lighting, and professional renderings. Prereq: FINE 1820. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4840 - Independent Study: FINE

Max hours: 12 Credits. **Semester Hours:** 1 to 3

FINE 4950 - Studio BFA Thesis

Studio: BFA Thesis involves the preparation, exhibition and critical faculty response to students' Creative work. Course work focuses on contemporary trends in the arts, the commerce of the arts and the professional practices necessary to an artist' Self-promotion. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4951 - Bachelor of Art Thesis

A seminar that emphasizes creative and original research through the composition of a substantial paper on a topic in art history. Through discussion, presentations, and individual readings, students will demonstrate skills in research, writing, and critical thinking. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 4980 - Gender in Contemporary Art

This lecture course will address ways in which gender issues have affected the creation and study of visual arts since

the early 20th century, with an emphasis on art and culture since World War II. Prereq: FINE2610 required for FINE-BA and FINE-BFA majors only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4990 - Contemporary Art: 1960 to Present

A lecture course about developments in art and architecture since 1960. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 4995 - Travel Study

Created for students doing travel study in a foreign country. Students register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

FINE 5020 - Graduate Anatomy for Artists

An intensive figure drawing course that focuses on structure, movement and proportions. Skeletal and muscular systems are studied using the classic texts of artistic anatomy. A research paper is also required. Prereq: Graduate Level Standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5190 - Graduate Photography

Graduate students create an independent body of photographic work that integrates sophisticated concepts with technical mastery. Through critiques, presentations and discussions, students relate subject matter to historical and contemporary context. Students build expertise in professional development in photography. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5200 - Graduate Painting/Drawing I

An intensive painting and drawing course for students who have completed their bachelor's degree in fine arts to further develop their technical and expressive means to implement their ideas. Self-directed studio is paired with studies in theoretical and critical analysis. Note: Students missing the first 2 classes of this course may be administratively dropped. Students will not be allowed to add course if they have missed the first 2 classes. Restriction: Restricted to CU Denver Graduate Students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5210 - Graduate Painting/Drawing II

This is the second level of graduate painting and drawing with a tutorial focus. Emphasis is placed on directed research and the development of significant body of original work reflecting student's expressive and theoretical concerns. Note: Students missing the first 2 classes of this course may be administratively dropped. Students will not be allowed to add course if they have missed the first 2 classes. Restriction: Restricted to CU Denver Graduate Students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5340 - Topics in Studio Art

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 5350 - Topics in Multimedia

Specialized topics are offered in new multimedia technologies, theories, processes and conceptual thinking. Course titles are unique and changing semester to semester. Prereq: Multimedia majors must have completed all required FINE 2000 level classes with a 2.75 GPA or have passed a portfolio review. Other majors must have permission of instructor as course prerequisites may vary depending on course subject matter. Priority seating is given to multimedia majors. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 5446 - Visualization & Infographics

In our data and information-rich society, visual representations of data can be useful for making sense of available information and fostering understanding. This course engages students in critique existing work and encourages a thoughtful design process toward creation of information graphics and simple data/information visualizations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5447 - Presenting Science

Sophisticated graphical components can help a viewing audience understand complex scientific information more clearly. This project-based learning course engages students in creation of thoughtful graphic explanations of science for the purpose of enhancing scientific presentations and audience comprehension. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5448 - BioMedical 3D Animation

3D Animation can be a powerful tool for telling stories rooted in science and medicine. This course provides opportunity to learn from existing animated works while honing skills in storyboarding, narrative and 3D animation with focus on biology, science, and health education. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 5450 - Social Engagement by Design

Through lectures, discussions and conducting onsite research in international settings, students will become familiar with professional practitioners' Perspectives and experiences in the field of socially engaged design while interrogating current practices, policies, and expectations that inform community engagement and by Design. Max hours: 6 Credits. **Semester Hours:** 3 to 6

FINE 5500 - Graduate Sculpture I

A tutorial format which asks students to be self-directed. Conceptual ideology is expanded through research connected to projects. Portfolio documentation and presentation are required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5510 - Graduate Sculpture II

A self-directed format where students engage in mentored individualized projects as an extension of FINE 5500, Graduate Sculpture I. Conceptual ideology is expanded through research connected to projects. Portfolio documentation and presentation are required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5522 - Interdisciplinary Art in Ireland

The interdisciplinary course introduces students to the methods and concepts of contemporary site-specific art as critical theory through lecture and critique and as practice in the rural/urban landscape and studio along Ireland's County Clare coastline in the Burren region. Max hours: 6 Credits. **Semester Hours:** 6 to 6

FINE 5523 - Topics in Art History I: Art Before Modernism

Variable: Art History lecture course pertaining to art before Modernism. Restriction: Restricted to Graduate Students. Max hours: 6 Credits. **Semester Hours:** 1 to 3

FINE 5524 - Topics in Art History II: Modern and Contemporary

Variable: Art History lecture course pertaining to art since Modernism. Restriction: Restricted to Graduate Students. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 5525 - Museum Studies

A seminar about museums and art galleries as institutions for the preservation and exhibition of cultural materials. Through writing assignments, discussions, site visits, and analysis, students will demonstrate knowledge and critical thinking on the display of art. Restriction: Restricted to Graduate Students. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 5600 - History of Modern Design:Industrial Revolution-Present

A lecture course involving the history of design from the Industrial Revolution to the present. The course will address the graphic design, typography, architecture, "Decorative arts", and new media from each period/major design movement in that time frame. Restriction: Restricted to Graduate Students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5610 - Pre-Columbian Art

A lecture course on the art and architecture of Mesoamerica and the Andes before the Spanish conquest. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate Students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5620 - American Art

A lecture course on the art of the United States from colonial times to World War II. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate Students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5625 - Studio Creative Process

Provides students with an understanding of the artistic creative process which is learned through an examination of pre-studio, studio and post-studio practices. Prereq: Must have at least two art history survey courses. Max hours: 6 Credits. **Semester Hours:** 3 to 3

FINE 5630 - History of Latin American Art:1520-1820

A lecture course studying Latin American art of 1520-1820, including major artists and periods. Through visual analysis, vocabulary acquisition, exams, and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the arts. Restriction: Restricted to Graduate Students. Cross-listed with FINE 4630. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5632 - History of Digital Media

Art historical survey and critical discourse of digital and electronic multimedia that covers the influences which have shaped this medium, its major contributors, the technological innovations and cultural impacts on society as an art form and commercial market form. Restriction: Restricted to Graduate Students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5644 - Topics in Art History

Restriction: Restricted to Graduate Students. Max hours: 9 Credits. **Semester Hours:** 1 to 3

FINE 5670 - Greek and Roman Art

A lecture course on art and architecture from ancient Greece and Rome. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5680 - Art of the Middle Ages

A lecture course on western European art and architecture from the fourth to the fourteenth centuries. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5700 - Italian Renaissance Art

A lecture course about developments in Italian Renaissance art and architecture. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits.

Semester Hours: 3 to 3

FINE 5705 - Northern Renaissance Art

A lecture course about developments in Northern Renaissance art and architecture. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits.

Semester Hours: 3 to 3

FINE 5710 - Baroque and Rococo Art

A lecture course on Italy, Spain, France, England, and the Netherlands during the seventeenth and eighteenth centuries. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5730 - Arts of Japan

A lecture course on selected themes and periods in Japanese art. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5750 - Arts of China

A lecture course on selected themes and periods in the arts and architecture of China. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5770 - Art of India and Southeast Asia

A lecture course on selected themes and periods in the arts of India and Southeast Asia. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5790 - Methods in Art History

A seminar about the various research methodologies in the history of art. Through reading, discussion, research, writing assignments, and presentations, students will demonstrate knowledge of art historiography. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5800 - Art Seminar

Required of Fine Arts majors in the B.F.A. and B.A. studio degree tracks majoring in Painting/Drawing, Photography or Sculpture. Course work covers research into professional practices, business practices, creative practice and career development. Note: Students missing the first 2 classes of this course may be administratively dropped. Students will not be allowed to add course if they have missed the first 2 classes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5825 - 3D Architectural Visualization

A lecture/lab course covering the 3D visualization of architectural projects. Students will develop skills/ knowledge about the techniques for creating realistic 3D Architectural visualization. Special emphasis will be placed creating realism in modeling, materials, lighting, and professional renderings. Intro level 3D/CAD skills req. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5840 - Independent Study: FINE

Max hours: 12 Credits. **Semester Hours:** 1 to 3

FINE 5939 - Internship

Max hours: 12 Credits. **Semester Hours:** 1 to 6

FINE 5980 - Gender in Contemporary Art

This lecture course will address ways in which gender issues have affected the creation and study of visual arts since the early 20th century, with an emphasis on art and culture since World War II. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5990 - Contemporary Art:1960-Present

A lecture course about developments in art and architecture since 1960. Through visual analysis, vocabulary acquisition, discussion, exams and writing assignments, students will demonstrate knowledge of historical developments and an ability to analyze the art. Restriction: Restricted to Graduate level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FINE 5995 - Travel Study

Created for students doing travel study in a foreign country. Students register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

FITV 1000 - Introduction to Visual Culture

Provides fundamentals in academic theories surrounding visual culture. Topics include representation, spectatorship, mass media and popular culture, new media, and scientific images. Student participation is through discussion, creative projects, reading, and written response. Cross-listed with THTR 1000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1035 - Introduction to Filmmaking

Students will be introduced to the concepts and practices of filmmaking. Through a series of hands-on exercises students will gain experience production management, cinematography, editing and client/director relationships. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1040 - Lighting, Grip, and Sound Introductory Workshop

The purpose of this course is to acquire basic competence with all film/video production equipment. The course acts as an introductory look at maintaining professionalism, efficiency, and safety in film/video sets for cast and crew. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1050 - Production I Basics of Film and Television

Learn the fundamentals of video production including idea creation, videography, composing a professional image, cinematic lighting, sound track recording and construction, non-linear software. Individual and collaborative productions for film, video, and TV will be created. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1115 - Horror in Western Culture and Cinema

This course is designed to analyze the history, practice and production of the horror film. By examining the horror genre students analyze how cinema is both a reflection of the time it was produced as well as it impacts on art and society. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1200 - Aesthetics of Television

The course will combine viewing of television programs with reading, writing and discussing television as students begin to understand intellectually, and learn to take an analytical view of this remarkable phenomenon. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1550 - Scriptwriting 1 - Fiction

Critical exploration of dramatic writing for stage and screen. Understand how imagery, character, story, narrative

structure, literary conventions, and more, impact compelling writing. Utilize effective writing and critiquing strategies focused on drafting and writing an original film/TV script. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 1600 - Writing Short Film:Non Fiction

Students study basic writing elements such as idea generation, character building, and scene setting while writing short non-fiction screenplays or teleplays for production. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2040 - Introduction to Digital Effects

Learn the fundamentals of digital effects, animation, compression, and color correction as you incorporate graphic elements into your productions. Demonstrate the skills to utilize software applications used to create 2D, 3D animation, and motion graphics, green screen technology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2050 - Production II Film and Television Techniques

Through a series of assigned film and TV projects students will be introduced to various genres of filmmaking, while building upon the skills of preproduction, production, and post-production. Prereq: FITV 1050/TFVP 1050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2090 - Production Management for Film and Television

Students will learn the various aspects of planning, scheduling, budgeting, and managing both television and film productions. Students will develop skills for conceptualizing projects from script to screen. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2220 - Acting for Film and Television

Provides the study, skill development and workshop experience for the actor in various media – including film, television, commercial, and voice-over work. Students do physical exercises, vocal training, develop vocabulary, and scene exercises. Cross-listed with THTR 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2570 - Directing for Film and Television

Through a series of assigned video projects, students will practice the art of directing several film and television projects. Applying communication skills and directing techniques to the process. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2650 - Sound for Film and TV

Building upon basic understandings of audio for film and television techniques, students will get intermediate instruction and experience with field audio recording and audio post-production practices. Students will work with

digital audio editing software to gain knowledge and skills in sweetening, mixing, and sound design. Prereq: FITV 1040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 2670 - Cinematography

Students create film and TV projects that exhibit effective use of light, composition, depth of field, focal length. Student directors will learn how to collaborate with cinematographers and understand the science of photography, lenses, and lighting. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3040 - TV Studio Production

Working in a multi-camera television studio environment, students in this course will experience each aspect of creating multiple live-to-tape television programs. Students will work in teams to create a television pilot as well as individual projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3050 - Production III: Junior Project

Students will refine their knowledge of single-camera film and TV techniques in this hands-on, collaborative course. Students will conceptualize, develop, and shoot a short film or television project throughout the semester. Emphasis on storytelling, production design, production management, and cinematography. Prereq: TFTV-BFA + FITV 2570/TFVP 3550, FITV 2050 or FILM 2050, FITV 1200, FITV 2670, FITV 2650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3055 - Documentary Production

Students produce non-fiction film/TV productions in collaboration with non-profit organizations while exploring and experiencing industry practices. Prereq: FITV 2050/TFVP 2050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3060 - Editing for Film and Television

Students will apply post-production skills learned in previous courses to edit projects produced in Prod 3/Jr Project. This course will emphasize the completion of a professional broadcast-quality production with full audio and visual sweetening. Students will attain advanced editing skills through a longer format project. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3090 - Producing Episodic Television

Students explore and develop skills in the collective practices necessary for the full production of an episodic television series. Students will actively participate in various aspects of episodic television production including preproduction, production, and post-production. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3200 - Film History 1

The development of cinema in the early 1880s brought with it a wealth of techniques still used today, from the close-up

to crosscutting and montage. In this course students will view, analyze, research, and critique the beauty and sophistication of silent film from its beginnings through the late 1930s. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3264 - Advanced Digital Effects

Students will study software and create projects with advanced visual effects. With industry standard techniques in animation, applying compositing, image acquisition and motion graphics. Students will create a variety of projects by the end of the semester. Prereq: FITV 2040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3300 - Film History 2

Take a journey through the many genres of film, from the introduction of sound to the present. Students will trace the development of various Hollywood genres and examine films that represent major developments in American cinema. In this course students will view, analyze, research, and critique films from 1938 to the present. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3350 - Editing Aesthetics

A historical, theoretical, and practical hands-on approach to deconstructing and utilizing editing aesthetics. Students will consider the theory behind editing strategies that elicit an emotional or response from viewers, and put those theories to practice through demonstrative production exercises as well as analytical writing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3400 - Feature Screenwriting

Emphasis is on creating character, conflict and structure through the use of theme, motifs, subplots, and story tone. Students complete the first act and a 25-page feature film treatment or the first draft of a feature-length script. Prereq: TFVP Majors: FITV 3500 - Non-TFVP Majors must have taken: Any Two of ENGL 3415, ENGL 3417, ENGL 2390 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3500 - Writing for Episodic Television

Explores the constructive and critical process of writing prime-time dramatic television and alternative broadcast platforms. Each student is guided through a series of viewings, readings, and writing exercises culminating with the written completion of television episodes for an original series. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3600 - Denver Film Festival

Students in this course will know how to contextualize films in terms of content and form. Through film viewing, written assignments, and critical analysis students learn to describe, classify and appreciate narrative, craft and artistic intent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 3999SA - Upper Div General Credit

- **Semester Hours:** 3 to 3

FITV 4000 - Senior Thesis Production

The first course of a two-part capstone experience in which students collaborate, plan, cast, budget, and produce a professional quality film/TV project or script. Projects/scripts will be completed in FITV 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 4010 - Senior Thesis Post-Production

Second course of a two-part capstone experience in which students collaborate on post-production to complete the film/TV/script project. Emphasis will be on editing, color-correcting, audio sweetening, graphics, finishing a fine-cut of their project; students will seek distribution and exhibition. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 4020 - CAM Film Productions

Under the supervision of a faculty member, this class works together as a group to create broadcast quality television projects. Projects will be designed for a PBS television market and may be aired as such. Pre-requisite: FITV 3050. Restriction: Restricted to TFTV-BFA majors. Max hours: 9 Credits. **Semester Hours:** 3 to 3

FITV 4050 - Shooting Action

In this production workshop, students will analyze films and storyboards, and shoot projects created for specific action and special effects outcomes. In addition, students will examine a variety of techniques used to create action scenes in preparation for the edit. Prereq: FITV 2670. Restriction: Restricted to TFTV-BFA majors within the College of Arts and Media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FITV 4600 - Special Topics

Specialized topics in film and video. Max hours: 12 Credits. **Semester Hours:** 1 to 3

FITV 4840 - Independent Study: FILM

Max hours: 12 Credits. **Semester Hours:** 1 to 3

FNCE 1000 - Intro to Risk Mgmt Insurance Careers

Provides a comprehensive overview of available Risk Management and Insurance careers. For all majors. Emphasis will be on interactions with industry professionals to provide hands-on knowledge and opportunities for in-depth discussion. Cross-listed with RISK 1000. Max hours: 1 Credit. **Semester Hours:** 1 to 1

FNCE 2939 - Internship

Max hours: 3 Credits. **Semester Hours:** 1 to 3

FNCE 3000 - Principles of Finance

This course provides an introduction to financial markets and institutions, financial statement analysis, interest rates and the time value of money, principles of security valuation, concepts of risk and return, and capital budgeting. Note: This course is required in the Business Core. A grade of 'C' or better must be earned. Prereq: DSCI/BANA 2010 and ACCT 2200 (both with a grade of 'C-' or higher), ECON 2012, and ECON 2022. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 3500 - Management of Business Capital

Students learn the basic principles governing the management of capital in the business firm. Topics include management of working capital, cost of capital, capital budgeting, firm valuation, and theory and management of capital structure, grade of 'C' must be earned to take subsequent courses for which this course is a pre-req.. Prereq: FNCE 3000 with a grade of 'C' or better. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 3600 - Financial Markets and Institutions

Focuses on the supply and demand for loanable funds, the process of money creation, the structure of interest rates, and the role of banks and the Federal Reserve in the financial system. Special attention is devoted to the impact of monetary and fiscal policies on interest rates, the flow of funds and economic activity; and the operation of financial markets and institutions. A grade of 'C' or better must be earned in this course to receive credit for the area of emphasis and to take subsequent courses for which it is a prerequisite. Coreq: FNCE 3000. If completed prior must have completed with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 3700 - Investment and Portfolio Management

In this course students learn about the different types of investment vehicles, including methods to estimate their value and analyze their risk. They will also be introduced to portfolio management, including the identification of objectives and constraints and the analysis and use of investment information. Topics include the functioning of security markets, asset allocation, security valuation, and portfolio analysis. A grade of 'C' or better must be earned to receive credit for the course, and to take subsequent courses for which it is a prerequisite. Note: FNCE 3700 and FNCE 3600 may be taken concurrently. Prereq: FNCE 3000. Coreq: FNCE 3500. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 3809 - Introduction to Risk Management

This course introduces students to fundamentals of risk and risk management for businesses and individuals. Insurance is among the risk management tools examined. The insurance industry and carrier operations are also explored. Coreq: FNCE 3000. If completed prior must have earned a grade of C or higher. Cross-listed with RISK 3809. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 3840 - Independent Study: FNCE

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits.

Semester Hours: 1 to 3

FNCE 3939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. To enroll in an internship, students must work with the Experiential Learning Center on campus and have a 2.40 GPA or higher.

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits.

Semester Hours: 1 to 3

FNCE 3949 - Experiential Learning with Risk Management Industry

This course will connect students to risk management service providers, through the Risk Management and Insurance (RMI) Program. The students will either intern, or carry out independent projects with specific providers. The RMI program and faculty will supervise and monitor task and assignments, and coordinate with the providers to maximize the learning experience. Prereq: FNCE 3809. Cross-listed with RISK 3949. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4129 - Practical Enterprise Risk Mgmt

Skills in legal and factual analysis and the application of ethical theories are advanced and refined through integrative cases. Topics include insurance law, personal property law, intellectual property law, agency, business organizations, securities, employment law, and consumer law. Special focus is placed on the relationship between insurance and risk and the topics covered. Prereq: FNCE 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with FNCE 6129 and RISK 4129/6129. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4370 - International Financial Management

Financial management in the international environment. Topics include international capital movements; international operations as they affect the financial functions; foreign and international institutions; and the foreign exchange process. Also considers foreign exchange theory and risk management, financial requirements, problems, sources, and policies of firms doing business internationally. Cross-listed with INTB 4370. Prereq: FNCE 3000 with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4382 - Survey of Financial and Commodity Derivatives

This course introduces forward contracts, used in price risk management for millennia. We cover the properties of forward/futures contracts, structure of the markets and strategic implications for speculation and hedging. We price forwards from spot price, and introduce convenience yield. Options used for insurance purpose (think of your car insurance as a put option) is a more expensive way to manage risk; we cover option strategies and basic pricing. The course concludes with swaps, credit derivatives and structured products. Asset classes covered are equity, fixed

income, currency, agriculture, energy (oil/gas and electricity) and metal/mining. Prereq: FNCE 3500 and FNCE 3700 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4470 - Behavioral Finance

Over the past several decades, the field of finance has developed a successful paradigm based on the notions that investors and managers were generally rational and the prices of securities were generally "efficient." In recent years, however, anecdotal evidence as well as theoretical and empirical research has shown this paradigm to be insufficient to describe various features of actual financial markets. In this course we examine how the insights of behavioral finance complements the traditional paradigm and sheds light on the behavior of asset prices, corporate finance, and various Wall Street institutions and practices. Prereq: FNCE 3500 with a C or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4500 - Corporate Financial Decisions

This is a required capstone course for the financial management emphasis. It uses the case method to develop the analytical and decision making skills of students. Students are required to apply theories and concepts learned in previous finance and accounting classes to real world scenarios. Topical coverage includes financial analysis, planning, control, working capital management, long-term investment and financing decisions and corporate valuation. A grade of 'C' or better must be earned to receive credit towards graduation. Prereq: DSCI/BANA 2010, ACCT 2200 and MATH 1070 all with a 'C-' or higher; MATH 1080, ECON 2012 and ECON 2022 all with a 'D-' or higher; FNCE 3000, 3500 and 3700 with a grade of 'C' or higher and senior standing. Restriction: Restricted to Business School majors with senior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4509 - Global Risk Management

This course is designed to study how risk is transferred globally. The course will include travel to London, which is the home to many of the world's largest insurers and reinsurers. While in London, we will visit and have presentations from insurance brokers, companies, Lloyds of London, and reinsurers. Cross-listed with FNCE 6509 and RISK 4509/6509. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4709 - Life and Health Insurance

The course is designed to provide the student with the basic understanding of life and health insurance concepts. The course will focus on a needs analysis for individual life insurance needs in preserving an estate or creating an estate. We also focus on the needs of the family and the preservation of the income stream for meeting short and long term needs and how we accomplish this via life insurance. We also will look at life insurance in terms of business planning using such concepts as key person life insurance, funding buy sell agreements, and related needs. On the health side, we will use a needs analysis approach to provide health coverage for the individual and family. We also explore the employee benefits arena and how businesses will focus on providing group medical coverage and related benefits in an ever changing health care environment with health care reform being phased in. We also will explore the internal workings of life and health insurance companies by review. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4750 - Business Intelligence and Financial Modeling

In this course, the student learns to analyze and solve financial problems with spreadsheet models, apply Oracle Financial and Business Intelligence software that is widely used in corporate financial operations and model risk and uncertainty with Monte Carlo software. Prereq: ISMG 2050 with a grade of C- or higher, FNCE 3000 and (ISMG 3000 or ACCT 4054) all with a grade of 'C' or higher. Cross-listed with ISMG 4750. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4802 - Foundations of Commodities

This course introduces students to the physical aspects of commodities and connects them to the financial markets in which commodities are traded. Fundamental concepts and terminology necessary for understanding commodity production, transportation, economics, financial analysis and marketing are described. Supply chains for several specific commodities are reviewed in detail, as examples of the production and market structure knowledge needed to be successful professional participants in commodity trading capacities. The course also serves a foundation for more focused education in the specific commodity sectors, as well as the applied use of marketing and financial trading concepts learned in other courses. Cross-listed with FNCE 6802 and CMDT 4802/6802. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4809 - Property & Casualty Insurance

Introduces students to fundamentals of risk & risk management for businesses & uses of property, casualty, liability, directors and officers insurance, including cost and pricing issues. Types of insurance companies, agencies, and brokerages are also explored, along with insurance company financial mgmt & current trends in insurance industry. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Cross-listed with RISK 4809. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4840 - Independent Study: FNCE

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 8 Credits. **Semester Hours:** 1 to 8

FNCE 4909 - Corporate Risk Management

The ultimate goal of corporate risk management is to maximize firm value by shaping a firm's risk profile. The risk management team identifies the type and level of risk exposure faced by their company. This helps the executive choose which risks to bear and which risks to transfer to other entities, in three basic ways: modifying the firm's operations, adjusting its capital structure, and employing targeted financial instruments such as derivatives, insurance contracts, and structured financial products. Prereq: FNCE 3500 with a grade of C or higher. Coreq: FNCE 3809. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with FNCE 6909 and RISK 4909/6909. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 4950 - Special Topics

Research methods and results, special topics and professional development in finance. Prerequisites vary according to topic and instructor requirements. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

FNCE 5939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. Prereq: 21 semester hours and 3.5 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

FNCE 6290 - Quantitative Methods for Finance

This course provides a statistical foundation for subsequent courses in the Master of Science in Finance program. Major topics include descriptive statistics, probability theory, statistical estimation and inference and regression analysis. The emphasis is on finance applications, such as risk measurement, for portfolio diversification and the "market model". In addition, students develop competence in the use of statistical software packages. This course provides preparation for the statistical portions of the Certified Financial Analyst professional examinations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6300 - Macroeconomics and Financial Markets

Covers the U.S. financial system in the global economy. Specific topics include financial institutions, money creation and monetary policy; the Federal Reserve System and its operation; the international financial system; interest rate determination, yield curves, and their relation to fiscal policy; the role of households and business in financial markets; stock markets; and money markets and instruments. (Required for the M.S. in Finance degree.) Coreq: BUSN 6620. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6310 - Financial Decisions and Policies

Emphasizes investment and financing decisions, and the analysis of the financial condition of the firm. Specific topics include capital budgeting, cost of capital, financing mix and strategy, firm valuation and management of working capital. Instruction is by the case method. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6330 - Investment Management Analysis

In this course students will learn investment theories and how to apply them to portfolio management. Topics covered include asset allocation, security markets, the analysis and use of investment information, risk analysis and security valuation. This course is required for the M.S. in Finance degree. Prereq: BUSN 6640 and BUSN 6620 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6340 - Business Firm Valuation

In this class, students will learn two valuation techniques, fundamental valuation and relative valuation, to value a business. These techniques are useful in such situations as valuing firms for mergers and acquisitions and valuing stocks for investment purposes. Some of the topics included are valuation of start-up firms, valuation of privately held firms, and valuation of firms with negative earnings. Prereq: BUSN 6640 with a grade of C (2.0) or higher.

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6350 - Financial Innovations

Innovations include zero coupon bonds, inflation indexed bonds, structured notes, asset-backed securities, collateralized mortgage obligations, and interest rate swaps. The student learns about the markets and pricing of these securities, and how they affect interest rate risk. The course prepares the student for careers in corporate treasury management, structured financing, swaps trading, and mortgage backed securities design. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6360 - Management of Financial Institutions

Overview of financial institutions and their risk management/financial performance management issues such as: management of operational, credit, liquidity, interest-rate, capital, off-balance sheet, and environmental risks; Uniform Bank Performance Report (UBPR) risk/performance analysis, hedging techniques and regulations/performance/risk. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6365 - Banking Principles and Practices

Covers money and capital markets, commercial lending, asset and liability management, loan portfolio management and bank management. This class is only available to Colorado Graduate School of Banking students. Similar material is covered in FNCE 6300 and FNCE 6360. Therefore Business School students must enroll in those courses. Banking students cannot receive credit for FNCE 6300 or FNCE 6360. Max hours: 9 Credits. **Semester Hours:** 3 to 9

FNCE 6370 - International Financial Management

Addresses financial management in an international context that considers international capital movements and foreign exchange problems, and international operations as they affect financial functions. It reviews foreign and international institutions and the foreign exchange process and considers financial requirements, problems, sources and policies of firms doing business internationally. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Cross-listed with INTB 6372. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6372 - Business Forecasting

Students learn forecasting methodologies such as ARIMA, regression, smoothing, and time-series decomposition applicable to marketing, finance, accounting, human resources management, and supply chain and production management decision-making. This course focuses on practical applications of forecasting techniques, choosing and comparing appropriate methods and applying the results to workplace situations. Prereq: BANA 6610 or BUSN 6530 or FNCE 6290 or (BUSN 6530 taken at CU Denver or consent of instructor - no CBK waivers of BUSN 6530 will be considered. Cross-listed with BANA 6630. Note: Can only receive credit for either DSCI 6230/BANA 6630 or FNCE 6372. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6380 - Futures and Options

This covers both speculation and hedging using futures and options. The student learns about futures pricing, how futures are related to the underlying commodities and how to design hedges. Stock index futures and interest rates futures get particular attention. The course covers the theory and application of option pricing, focusing on the binomial and Black-Scholes models. Popular options trading strategies are discussed. This course is useful for those who wish to trade or become portfolio managers, as well as those who plan on corporate treasury management. Prereq: BUSN 6640 with a C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6382 - Survey of Financial Derivatives

This course introduces forward contracts, used in price risk management for millennia. We cover the properties of forward/futures contracts, structure of the markets and strategic implications for speculation and hedging. We price forwards from spot price, and introduce convenience yield. Options used for insurance purpose (think of your car insurance as a put option) is a more expensive way to manage risk; we cover option strategies and basic pricing. The course concludes with swaps, credit derivatives and structured products. Asset classes covered are equity, fixed income, currency, agriculture, energy (oil/gas and electricity) and metal/mining. Prereq: BUSN 6640. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6410 - Real Options and Decisions Under Uncertainty

This is an applied course in making investment decisions under uncertainty and flexibility. Traditional NPV analysis using tools such as Discounted Cash Flow (DCF) model assumes that once an investment decision has been made, managers have no control over the outcome and they remain passive throughout the life of the project. Most corporate projects, however, have a great deal of flexibility in terms of their execution. This course will help students develop skills to identify and analyze real options so that they may approach real world corporate investment decisions in a strategic manner. This course may be used to fulfill the requirement for an options course in the MS (Finance) program. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6411 - International Corporate Governance

Discusses the structure and goals of the modern corporation, the primary governance mechanisms used to help companies achieve these goals, and how and why these roles, goals, and mechanisms vary across nations. The topics to be covered in the course include how share ownership, particularly by institutional shareholders, managerial compensation and board of director activities are being used to improve corporate governance systems. The class compares the Codes of Best Governance Practices from several countries as well as recent innovations in individual company governance rating systems. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Note: Students cannot receive credit for both FNCE 6411 and INTB 6411. Cross-listed with INTB 6411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6420 - Mergers and Acquisitions

Examines the processes and decisions by which mergers, takeovers and other corporate restructuring are, the

transactions occur. Analyzes merger and acquisition decisions as part of strategic decision making, and how firms are valued in mergers. Discusses the market for corporate control and the public policy implications of mergers and corporate governance. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6450 - Short-Term Financial Management

This course is a survey of methods for managing short term assets and liabilities. Specific topics include the analysis of the firm's liquidity and cash flow, banking relationships; collection and disbursement systems; management of short term investment and financing; management of receivables, payables and inventory; and short term forecasting. This course is affiliated with the Association of Financial Professionals, allowing students earning at least a 'B' to sit for the Certified Treasury Professional (CTP-A) exam. Prereq: BUSN 6640 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6460 - Emerging Market Finance

This course aims to explore key emerging market finance issues from the perspectives of corporations, investors and markets. Emerging economies are deemed to be the engine of growth opportunities in the world economy. However, compared with developed markets, they typically have some unique features in their economic systems and financial markets, and thus different risk and return characteristics, leading to special considerations of capital budgeting, financing and investing in these economies. This course is to help develop a better understanding of financial markets, corporate finance and investments in emerging economies, with case studies on some major emerging markets (e.g., China, India). Prereq: BUSN 6620 and 6640. Cross-listed with INTB 6460. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6470 - Behavioral Finance

Over the past several decades, the field of finance has developed a successful paradigm based on the notions that investors and managers were generally rational and the prices of securities were generally "efficient." In recent years, however, anecdotal evidence as well as theoretical and empirical research has shown this paradigm to be insufficient to describe various features of actual financial markets. In this course we examine how the insights of behavioral finance complements the traditional paradigm and sheds light on the behavior of asset prices, corporate finance, and various Wall Street institutions and practices. Prereq: BUSN 6640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6480 - Financial Modeling

Develops and implements financial models for purposes of financial planning and decision making. This course is intended to allow the student to increase her or his knowledge and skill in the development of various types of computer-based financial planning models. The students are exposed to the uses of a variety of computer software packages that can be used for modeling financial planning problems. Prereq: BUSN 6640, knowledge of computer and spreadsheet software. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6509 - Global Risk Management

This course is designed to study how risk is transferred globally. The course will include travel to London, which is the

home to many of the world's largest insurers and reinsurers. While in London, we will visit and have presentations from insurance brokers, companies, Lloyds of London, and reinsurers. Cross-listed with FNCE 4509 and RISK 4509/6509. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6800 - Special Topics

Experimental course offered irregularly for the purpose of presenting new subject matter in finance. Prerequisites vary depending upon topics covered. (Consult the 'Schedule Planner' for semester offerings.) Prereq: BUSN 6640. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 9 Credits. **Semester Hours:** 3 to 3

FNCE 6802 - Foundations of Commodities

This course introduces students to the physical aspects of commodities and connects them to the financial markets in which commodities are traded. Fundamental concepts and terminology necessary for understanding commodity production, transportation, economics, financial analysis and marketing are described. Supply chains for several specific commodities are reviewed in detail, as examples of the production and market structure knowledge needed to be successful professional participants in commodity trading capacities. The course also serves a foundation for more focused education in the specific commodity sectors, as well as the applied use of marketing and financial trading concepts learned in other courses. Cross-listed with FNCE 4802 and CMDT 4802/6802. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6809 - Principles of Risk and Insurance

Prepares students for advanced work in insurance and risk management. The course first covers the nature of risk and risk fundamentals, insurer operations, and insurance regulation. It then considers the principal techniques of managing risk exposures and the bases for decision making in management of business and personal risks. Prereq: BUSN 6640 (not strictly enforced). Cross-listed with RISK 6809. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6840 - Independent Study: FNCE

Instructor approval required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 8 Credits. **Semester Hours:** 1 to 8

FNCE 6909 - Corporate Risk Management

The ultimate goal of corporate risk management is to maximize firm value by shaping a firm's risk profile. The risk management team identifies the type and level of risk exposure faced by their company. This helps the executive choose which risks to bear and which risks to transfer to other entities, in three basic ways: modifying the firm's operations, adjusting its capital structure, and employing targeted financial instruments such as derivatives, insurance contracts, and structured financial products. Prereq: FNCE 3500 with a grade of C or higher. Coreq: FNCE 3809. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with FNCE 6909 and RISK 4909/6909. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNCE 6995 - Travel Study

Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 5000 - Teaching as a Profession

General foundations of education course for pre-service candidates. Provides a broad overview of the historical, sociological, philosophical, and legal foundations of education. Includes an examination of contemporary issues in schooling, school organizational patterns, and the professional rights and responsibilities of the teacher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 5660 - History of Schooling in the United States

This course introduces education professionals to the history of contemporary public school. The contents of this course emphasize the ways in which people from marginalized national and cultural groups have experienced education through eras of compulsory schooling, school segregation, and the contemporary context of school reform. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 5810 - Special Topics

Variable credit courses designed to deal with specific areas of content not covered in-depth in other program offerings; e.g., the social structure of the classroom. Max hours: 3 Credits. **Semester Hours:** 1 to 3

FNDS 5840 - Independent Study: FNDS

Max hours: 4 Credits. **Semester Hours:** 1 to 4

FNDS 5920 - Readings in Foundations of Education

Critical examination of very recent publications in the field of foundations: books and professional journal publications. Prereq: At least one graduate-level course in foundations and permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 6350 - Seminar: Foundations of Education

Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 6600 - Special Topics: Laboratory in Educational Leadership and Innovation

Laboratories are organized by professors to engage students in on-going research programs. They provide opportunities for students to extend and apply knowledge and skills developed in course work. The laboratories enable students to

complete portfolio requirements and work on doctoral dissertations. Prereq: Admission to M.A. or PhD programs; permission of instructor. Cross-listed with FNDS 7600. Max hours: 6 Credits. **Semester Hours:** 1 to 6

FNDS 6920 - Readings in Foundations of Education

Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 6950 - Master's Thesis

Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 7370 - Dissertation Seminar

Max hours: 1 Credit. **Semester Hours:** 1 to 1

FNDS 7420 - History and Philosophy of Education: Twentieth Century America

Designed around selected themes from 20th century American social, political and economic history. Students examine such issues as immigration, racism, war, and social reform to identify the larger societal forces, ideas, and values that have shaped contemporary American education. Overriding purpose of the course is the development of an enlarged frame of reference from which to exercise professional judgment. Cross-listed with FNDS 5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 7500 - Contemporary Philosophies of Education

Provides an examination of selected contemporary philosophies and their impact on educational thought and practice. Students are challenged to determine their own educational philosophy, while yet recognize and respect the variety of beliefs of educators. Students are asked to re-examine current educational issues from within the perspectives of different philosophies. Cross-listed with FNDS 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 7600 - Special Topics: Laboratory in Educational Leadership and Innovation

Laboratories are organized by professors to engage students in on-going research programs. They provide opportunities for students to extend and apply knowledge and skills developed in course work. The laboratories enable students to complete portfolio requirements and work on doctoral dissertations. Prereq: Admission to M.A. or PhD programs; permission of instructor. Cross-listed with FNDS 6600. Max hours: 6 Credits. **Semester Hours:** 1 to 6

FNDS 7840 - Independent Study: FNDS

Max hours: 4 Credits. **Semester Hours:** 1 to 4

FNDS 7930 - Teaching Internship in Foundations of Education

Max hours: 3 Credits. **Semester Hours:** 3 to 3

FNDS 8990 - Doctor of Philosophy Dissertation

Max hours: 10 Credits. **Semester Hours:** 3 to 10

FNDS 8991 - Doctor of Education Dissertation

Max hours: 10 Credits. **Semester Hours:** 3 to 10

FREN 1000 - Introduction to Cultures of the French- Speaking World

Introduces students to the many cultures of the French-speaking world. Taught in English for accessibility to students from different colleges at the University. The countries studied are: France, its overseas departments (Guadeloupe and Martinique) and territories (Tahiti); Quebec; Senegal; and other African countries. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1. **Semester Hours:** 3 to 3

FREN 1001 - French Language I

Introductory course in French language skills, in which basic grammatical structures are introduced, together with elementary vocabulary and cultural items that allow the student to carry on simple conversations in French. No previous study of French is required. No co-credit with FREN 1010. Max hours: 4 Credits. **Semester Hours:** 4 to 4

FREN 1002 - French Language II

Second semester of elementary French language skills- continuation of French Language I (FREN 1001). More complex grammatical structures are introduced together with appropriate vocabulary and cultural and literary readings that allow students to carry on more complex conversations. Note: This course assumes that students have passed FREN 1001 or 1010 or equivalent, or have taken one year of high school French, or possess equivalent proficiency. A grade of C- or higher in the previous French course is recommended for success in this course. This course is not intended for native speakers. No co-credit with FREN 1020. Max hours: 4 Credits. **Semester Hours:** 4 to 4

FREN 1010 - Beginning French I

Basic grammatical and syntactic structures are introduced, together with an elementary vocabulary and cultural items that allow the student to carry on simple conversations in French. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. No previous study of French is required. Max hours: 5 Credits. **Semester Hours:** 5 to 5

FREN 1020 - Beginning French II

(Continuation of FREN 1010.) More complex grammatical structures are introduced, and literary and cultural readings are added. Elementary vocabulary and cultural awareness are expanded to enable the student to carry on more complicated conversations. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed FREN 1001 or 1010 or equivalent, or have taken one year of high school French, or possess equivalent proficiency. A grade of C- or higher in the previous French course is recommended for success in this course. This course is not intended for native speakers. Max hours: 5 Credits. **Semester Hours:** 5 to 5

FREN 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

FREN 2003 - French Language III

Third semester of French language skills- continuation of French Language II (FREN 1002). Further introduction to beginning & intermediate level grammatical structures with appropriate vocabulary and cultural & literary readings that allow students to understand oral & written French and to speak & write in French in everyday situations. Note: This course assumes that students have passed FREN 1002 or 1020 or equivalent, or have taken two years of high school French, or possess equivalent proficiency. A grade of C- or higher in the previous French course is recommended for success in this course. This course is not intended for native speakers. No co-credit with FREN 2110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 2004 - French Language 4: Introduction to Advanced Studies

This course is designed to review and further develop French language skills, to continue the study of Francophone cultures and to prepare students for advanced-level French studies. Note: This course assumes that students have passed FREN 2003 or 2110 or equivalent, or have taken three years of high school French, or possess equivalent proficiency. A grade of C- or higher in the previous French course is recommended for success in this course. This course is not intended for native speakers. No co-credit with FREN 2020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 2110 - Intermediate French I: Grammar Review, Reading and Composition

Designed to further develop all the language skills, with particular emphasis on reading and writing, and to further continue students' introduction to French culture. Students review grammar and vocabulary, read and discuss *Le Petit Prince*, and express their reactions to the text both orally and in writing. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed FREN 1002 or 1020 or equivalent, or have taken two years of high school French, or possess equivalent proficiency. A grade of C- or higher in the previous French course is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 2120 - Intermediate French II: Grammar Review and Conversation

Designed to further develop all the language skills, with particular emphasis on speaking, and to continue students' introduction to French culture. Students review grammar and vocabulary, read and discuss short cultural texts and participate in oral activities intended to increase communication skills. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed FREN 2003 or 2110 or equivalent, or have taken three years of high school French, or possess equivalent proficiency. A grade of C- or higher in the previous French course is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Sophomore standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

FREN 3010 - French Phonetics and Pronunciation

Helps students acquire speech habits through knowledge of phonetics. Topics include the function of the speech organs, accurate production and recognition of sound, and the use of phonetic symbols. Note: Students with native or near-native level proficiency in French must consult with the French advisor before enrolling in this course. These students may, in some cases, take this course. The instructor of the course and/or the French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3020 - Oral Practice

Conversation course, using dialogues, debates, small-group discussion, and short oral presentations to improve fluency in spoken French and to build vocabulary. Discussions center around current issues. Note: Students with native or near-native-level proficiency will not be allowed to take FREN 3020. The instructor of the course and/or the French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3050 - Advanced Grammar and Composition

Rigorous review of grammar (including past and future tenses, conditional mood and nominal phrase), along with development of writing skills through analysis and discussion of selections from French writers. Through questions and written exercises, students familiarize themselves with vocabulary, spelling, syntax and grammar. Note: May be taken before or after FREN 3060. Students with native or near-native level proficiency in French must consult with the French advisor before enrolling in this course. These students may, in some cases, take this course. The instructor of the course and/or the French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Note: This course

assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3060 - Advanced French Language Skills

Rigorous review of grammar (including subjunctive, interrogative, verbal phrase and passive voice), along with development of writing skills through analysis and discussion of selections from French writers. Through questions and written exercises, students familiarize themselves with vocabulary, spelling, and grammar. Note: May be taken before or after FREN 3050. Students with native or near-native level proficiency in French must consult with the French advisor before enrolling in this course. These students may, in some cases, take this course. The instructor of the course and/or the French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3112 - Survey of French Literature I

Introduces survey of the major literary trends and prominent writers of French literature from 842 A.D. to the end of the 18th century. Note: May be taken before or after FREN 3122. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3120 - French Cultural Identities: Myths and Realities

The self-assured demeanor of the average French man or woman both attracts and confounds. In fact, a French person's behavior -- or that of the French government -- can seem impossible to decode if not understood within an authentically French context. This course examines that context and explores how the French view everyday life. Includes analysis of classic French films. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3122 - Survey of French Literature II

Introduces survey of the major literary trends (romanticism, realism and existentialism) and writers of the 19th and 20th centuries. Students become acquainted with prominent writers of the period such as Beauvoir, Chateaubriand, Hugo, Balzac, Flaubert, Proust, Camus and Sartre. Note: May be taken before or after FREN 3112. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3130 - Current Topics of the French-Speaking World

Combines discussion and writing on political, economic, and social conditions in contemporary France and the Francophone world. Articles from current French newspapers, news magazines, television broadcasts, and the World Wide Web are analyzed for a better understanding of modern French culture. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3140 - Contemporary Francophone Cultures

Through the reading of short stories and cultural texts, engages students in the exploration of cultures of the Francophone world. Addresses political, economic and geographic status of each region as well as societal identity, immigration, the individual and cultural identity. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3200 - The Francophone World in the Post-Colonial Era

Focuses on the many Francophone regions of the world, including (but not limited to) France, North and West Africa, Southeast Asia, and the Caribbean, and surveys a wide span of subject matter as it pertains to the post-colonial situations in these regions. Taught in English. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq: Sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 3840 - Independent Study: FREN

Max hours: 6 Credits. **Semester Hours:** 1 to 3

FREN 3939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FREN 3970 - Special Topics

Varying topics in French and Francophone language, literature and culture appropriate to the 3000 level, not otherwise covered by regular courses. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Note: May be taken more than once, provided that the topic is different each time. Max hours: 9 Credits. **Semester Hours:** 3 to 3

FREN 3995 - Travel Study

For students doing travel study in the Francophone world; register through the Office of International Affairs. Note: This course assumes that students have passed FREN 2004 or 2120 or equivalent, or have taken four years of high school French, or possess equivalent proficiency. Max hours: 15 Credits. **Semester Hours:** 3 to 6

FREN 4010 - Advanced Composition: Stylistics

Focuses on improvement of writing skills and development of the student's ability to compose logically and convincingly. The writing styles to be studied include: narration, description, portrait, persuasive essay and report.

Note: This course assumes that students have passed FREN 3050 or 3060 or an equivalent course, plus one other 3000 level course in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4050 - Advanced French for Business

Concentrates on the technical language necessary to meet the economic and commercial needs of the modern world. Prepares students for the practical certificate of business and economic French of the Paris Chamber of Commerce. Note: Students with native or near-native level proficiency in French must consult with the French advisor before enrolling in this course. These students may, in some cases, take this course. The instructor of the course and/or the French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Note: This course assumes that students have passed FREN 3050 or 3060 or an equivalent course, plus one other 3000 level course in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4082 - Introduction to Translation

Introduces the methodology and practice of written translation from English to French/French to English. Students will learn techniques on how to avoid word by word translation, faulty sentence structure and anglicisms by focusing on grammar, syntax and vocabulary. Note: Students must demonstrate third-year competence and advanced writing skills in English. Students with native or near-native level proficiency in French must consult with the French advisor before enrolling in this course. These students may, in some cases, take this course. The instructor of the course and/or the French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Note: This course assumes that students have passed FREN 3050 or 3060 or an equivalent course, plus one other 3000 level course in French. Cross-listed with FREN 5082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4200 - French Civilization Through the Nineteenth Century

Development of French culture and civilization from a historical perspective, beginning with the origins of France and continuing through the 19th century. Includes historical background, sciences and techniques, daily life, the arts, literature and philosophy, and religion. Note: May be taken before or after FREN 4210. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed two 3000 level courses in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4210 - French Civilization - Twentieth and Twenty-First Centuries

(Continuation of FREN 4200) The development of French culture and civilization in a historical perspective from the beginning of the 20th century to the present. Includes historical background, sciences and techniques, daily life, the arts, literature and philosophy, and religion. Note: May be taken before or after FREN 4200. Note: This course assumes that students have passed two 3000 level courses in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4310 - Seventeenth Century Literature

An in-depth study of the century considered to be the pinnacle of French theatre. Includes plays by Racine, Moliere and Corneille, as well as poetry by Lafontaine and Boileau. Note: This course assumes that students have passed FREN

3112 or 3122 or an equivalent course, plus one other 3000 level course in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4360 - Eighteenth Century Novel, Theater and Poetry

Studies several novels and plays characteristic of the 18th century as well as some of the more famous poems. Includes Diderot, Rousseau, Voltaire, Marivaux and Laclos. Note: This course assumes that students have passed FREN 3112 or 3122 or an equivalent course, plus one other 3000 level course in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4430 - Nineteenth Century French Novel

Development of the French novel during the 19th century. Includes such writers as Stendhal, Hugo, Balzac, George Sand, Flaubert, Maupassant and Zola. Note: This course assumes that students have passed FREN 3112 or 3122 or an equivalent course, plus one other 3000 level course in French. Cross-listed with FREN 5430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4480 - Twentieth Century French Novel

Represents novels of the 20th century, a period of great innovation in the French novel. Authors generally treated are Camus, Giono, Ernaux and Duras. Note: This course assumes that students have passed FREN 3112 or 3122 or an equivalent course, plus one other 3000 level course in French. Cross-listed with FREN 5480. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4490 - Twentieth Century French Theater

Surveys the major movements in French literature of the 20th century as represented in the theater arts. Such authors as Jarry, Artaud, Apollinaire, Giraudoux, Sartre, and Beckett are discussed. Note: This course assumes that students have passed FREN 3112 or 3122 or an equivalent course, plus one other 3000 level course in French. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4510 - French Women Writers

Designed to explore writings by French and Francophone women from the Middle Ages to the present. Addresses the question of what it means to be a woman and want to write. The selections include a wide variety of genres: autobiographical writings, stories, poems, manifestos, letters, political and historical documents. Note: This course assumes that students have passed FREN 3112 or 3122 or an equivalent course, plus one other 3000 level course in French. Cross-listed with FREN 5510 and WGST 4511/5511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4520 - Voices of Haiti and the Caribbean

This course explores the literary production of contemporary Haitian and Caribbean writers within varied cultural and gender contexts. It focuses on historical, societal and post-quake issues confronting both men and women writers of the French Caribbean. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed FREN 3112 or 3122 or an equivalent

course, plus one other 3000 level course in French. Cross-listed with FREN 5520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4600 - History of the French Language

Studies phonological, morphological, and syntactic changes in the language of Gaul from Latin to modern French. Note: This course assumes that students have passed FREN 3010 and FREN 3050 or 3060 or equivalent courses. Cross-listed with FREN 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 4840 - Independent Study: FREN

Max hours: 12 Credits. **Semester Hours:** 1 to 3

FREN 4841 - Independent Study: FREN

Max hours: 9 Credits. **Semester Hours:** 1 to 3

FREN 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

FREN 4970 - Special Topics

Varying topics in French and Francophone language, literature and culture appropriate to the 4000 level, not otherwise covered by regular courses. Note: This course assumes that students have passed two 3000 level courses in French. Note: May be taken more than once, provided that the topic is different each time. Max hours: 9 Credits. **Semester Hours:** 3 to 3

FREN 4995 - Travel Study

For students doing travel study in the Francophone world; register through the Office of International Affairs. Cross-listed with FREN 5995. Note: This course assumes that students have passed two 3000 level courses in French. Max hours: 15 Credits. **Semester Hours:** 1 to 15

FREN 5082 - Introduction to Translation

Introduces the methodology and practice of written translation from English to French/French to English. Students will learn techniques on how to avoid word by word translation, faulty sentence structure and anglicisms by focusing on grammar, syntax and vocabulary. Note: Students must demonstrate third-year competence and advanced writing skills in English. Students with native or near-native level proficiency in French must consult with the French advisor before enrolling in this course. These students may, in some cases, take this course. The instructor of the course and/or the

French advisor reserve the right to determine the level of linguistic proficiency of the student and his or her admission to the class by means of an oral interview and/or placement exam scores. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Cross-listed with FREN 4082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5200 - French Civilization Through the Nineteenth Century

Development of French culture and civilization from a historical perspective, beginning with the origins of France and continuing through the 19th century. Includes historical background, sciences and techniques, daily life, the arts, literature and philosophy, and religion. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5210 - French Civilization - Twentieth and Twenty-First Centuries

(Continuation of FREN 5200) The development of French culture and civilization in a historical perspective from the beginning of the 20th century to the present. Includes historical background, sciences and techniques, daily life, the arts, literature and philosophy, and religion. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5430 - Nineteenth Century French Novel

Development of the French novel during the 19th century. Includes such writers as Stendhal, Hugo, Balzac, George Sand, Flaubert, Maupassant and Zola. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Cross-listed with FREN 4430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5480 - Twentieth Century French Novel

Represents novels of the 20th century, a period of great innovation in the French novel. Authors generally treated are Camus, Giono, Ernaux and Duras. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Cross-listed with FREN 4480. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5510 - French Women Writers

Designed to explore writings by French and Francophone women from the Middle Ages to the present. Addresses the question of what it means to be a woman and want to write. The selections include a wide variety of genres: autobiographical writings, stories, poems, manifestos, letters, political and historical documents. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Cross-listed with FREN 4510 and WGST 4511/5511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5520 - Voices of Haiti and the Caribbean

This course explores the literary production of contemporary Haitian and Caribbean writers within varied cultural and gender contexts. It focuses on historical, societal and post-quake issues confronting both men and women writers of the

French Caribbean. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Cross-listed with FREN 4520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5600 - History of the French Language

Studies phonological, morphological, and syntactic changes in the language of Gaul from Latin to modern French. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Cross-listed with FREN 4600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

FREN 5840 - Independent Study: FREN

Max hours: 3 Credits. **Semester Hours:** 1 to 3

FREN 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

FREN 5995 - Travel Study

For students doing travel study in the Francophone world; register through the Office of International Affairs. Cross-listed with FREN 4995. Prereq: graduate standing. Note: This course is intended for students with an undergraduate degree in French or advanced-level proficiency. Max hours: 15 Credits. **Semester Hours:** 1 to 15

GEMM 6000 - 21st Century Global Energy Issues and Realities

Introduction to the global energy industry's past, present and future. Current and historical issues in regions such as: Atlantic Basin, former Soviet Union, east of Suez, North and South America will be covered. World production centers and markets are discussed to include relevant energy security, scenario planning, risk management and regulation, deregulation, and environmental concerns. Note: Students will learn the geographic distribution of energy resources worldwide including governmental systems. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEMM 6100 - Global Energy Economics

Course includes energy geo-economics with an introduction to managerial tools of the trade. Topics will include world energy markets-demand and supply; refining and marketing, energy forecasts, oil and gas transportation, and National Oil Companies vs. International Oil Companies. An introduction to environmental economics will also help students connect the energy industry to sustainable work practices. In addition students will learn the geographic distribution of energy resources worldwide along with the political and government systems associated with those resources. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6200 - Environmental, Regulatory, Legal & Political Environment in the Energy Industry

Exploration of current political situations regarding the energy industry, its environmental impact in the short and long term. Topics include climate change, pollution, solid wastes and conversions to natural resources. Students will become familiar with national and international energy laws and regulations, financial arrangements, confidentiality, and bidding agreements. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6210 - Energy and the Law: Property and Contracts

The elective will focus on the process of managing the use and development of land resources in a sustainable way. Topics such as; public controls, powers used for land regulation, and an intro to real estate will be covered to enhance students understanding of land management and its application to the energy industry. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6220 - Interacting With Foreign Governments And State Enterprises

Globalization of many energy companies, dwindling U.S. energy sources, and growing overseas energy demand have increased the need for energy professionals to gain expertise in doing business with foreign governments and state enterprises, which play a much greater role in the ownership and operation of energy extraction and energy delivery in virtually all countries beyond the United States and Canada. This course reviews negotiation strategies in the context of uncertain contract enforcement, volatility and uncertainty of prices and restrictions, and highly contentious political contexts. It also reviews the approaches for interacting effectively with state enterprises that are often undercapitalized and inefficient, and examines how valuation of energy assets can take into account political risk, and requirements to provide infrastructure and social services. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6230 - Political Risk Management for Global Energy Environmen

The course examines public influence on energy business activities. Students will explore the economics of political action and methods for evaluating how stakeholder groups interact to influence political outcomes. They will use these tools to develop strategies for stakeholder engagement and to manage business risks. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6300 - Technical Aspects of Energy Science

This course will familiarize students with the newest renewable and alternative energy sources. The course does not focus on hydrocarbon sources but examines challenges and opportunities that exist for the establishment of the new energy sources to become viable in the industry. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6400 - Leadership and Decision Making in the Global Energy Environment

Students will examine leadership from an energy executive perspective. Topics include: how execs lead, change, innovation, interacting with top management teams, the board, leadership issues involved with governance of the firm, strategies for enhancing executive influence and ethics and responsibilities associated with exec. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6410 - People Management in the Global Energy Environment

Explains that people are energy's most important asset. Students will learn the latest research in human resource theories, study models, and learn how to develop organizational effectiveness from the firm's human capital. Concepts on: effective teamwork, attracting and retaining talent and using HR processes such as performance management and development to drive engagement will be discussed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6430 - Organizational Behavior in the Energy Industry

Students will learn how to lead and manage human assets inside energy industries. Students will be exposed to fundamental principles of human behavior and increase their competence of working in diverse settings. Proper management can lead to a sustainable competitive advantage, because of management of employees and developing them into enthusiasts of your firm. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6450 - Strategic Management of the Energy Industry

The course focuses on how to improve an organization's competitiveness in a changing global environment. Emphasis on sustainable strategies, students develop skills to formulate, implement and evaluate organizational strategies in the rapidly changing environment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6460 - Integrated Information Management for Energy Firms

This course covers issues associated with developing an integrated information managing strategy to identify major information categories used with an energy firm. It covers relationships to business processes to guide applications development and facilitate the integration and sharing of data. Using case studies from energy firms operational, administrative and strategic systems will be discussed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6470 - Energy Marketing and Communications

This course covers the challenges faced by energy industries in developing branding, and developing new markets. Marketing both products and the company to its stakeholders, in the face of competitive pressures, students learn practical marketing tools and how they can be used to effect corporate strategy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6500 - Energy Accounting in the Global Markets

The course builds a basic understanding of how to convey to decision makers, in and out of the firm, information about its resources. Emphasis on; analysis of income statements, balance sheet, statement and cash flows (historical financial accounting information) with specific coverage of cost-volume-profit, variance, forecasting, joint interest accounting and measurement of divisional performance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6600 - Introduction To Financial Management In The Energy Industry

Introduction to fundamental principal of asset valuation and financing in competitive global markets. Providing the tools necessary to analyze day-to-day financial issues in the energy industry (time value of money, valuation of income

streams, risk weighted investment returns.) Topics such as: risk management, arbitrage, hedging and foreign exchange will be covered. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEMM 6610 - Advanced Financial Management in the Energy Industry

This course is focused on understanding the costs and benefits of various forms of capital. By examining internal and external managers, students will be able to assess alternative capital sources to achieve their strategic objectives. The course will introduce effective investor communication techniques. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6620 - Energy Asset & Production Management for the Energy Industry

The course covers management of an organization's energy resources and facilities as well as broader coverage of project management. Portfolio strategy, planning, scope, time, cost, quality and organizational effectiveness will be addressed. Also when budget, material, vendor relations or other factors disrupt a project, students will be prepared on how to react. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEMM 6630 - Commercialization Management of Renewable Energies

This course will focus on the business aspects running a renewable energy entity either as a separate company or sector within an established company. Students taking this course have completed a previous course on the basic science of renewable energy. This course is intended to focus on leadership issues and decision making regarding renewable energy. As a significant part of the course, students will learn how to review information and data supplied to them by engineers, accountants, finance, marketing, scientists, and other stakeholders within and outside their company including federal, state, and local governments and regulatory agencies to make sound business decisions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEMM 6690 - Special Topics

This elective course is intended to be a variable-credit course specially designed to provide national and international learning opportunities. The course will offer concentrated problem-solving experiences within the energy industry through travel to industry-significant cities and regions, while meeting and visiting with people working and dealing with issues in the industry. Max hours: 6 Credits. **Semester Hours:** 1 to 3

GEMM 6840 - Independent Study

Allow students to gain additional experience in a particular realm of energy business that interest them and suit their ultimate career goals. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOG 1102 - World Regions Global Context

Analyzes world regions and their global interconnectedness, including the dynamic and complex relationships between people and the world they inhabit. Demographic and cultural (political, economic, and historic) issues are examined as well as interactions between human societies and natural environments. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. GT: Course

is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2. **Semester Hours:** 3 to 3

GEOG 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOG 1202 - Introduction to Physical Geography

The science that studies the processes, forms, and spatial or geographic structures of natural systems operating at or near the earth's surface, including weather, climate, and landform processes. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 3 to 3

GEOG 1302 - Introduction to Human Geography

Systematic introduction to basic concepts and approaches in human geographic analysis. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 1332 - Topics in Science

A series of five-week modules on various topics in physical geography. Section 001. Violent Storms. Analysis of the causes, characteristics, and regional patterns of thunderstorms, tornadoes and hurricanes, emphasizing the hazards associated with each type of storm. Section 002. Elementary Surveying. Introduces the various techniques of running a traverse, location of points by intersection and resection, determination of distance by pacing, chaining, stadia and trigonometry and carrying of elevations. Section 003. Basic Navigation. Introduces the principles of navigation using the sun as the celestial body. Emphasis is on determining latitude and longitude at solar noon. Section 004. Earthquakes. The characteristics, causes, and results of earth movements along faults. Section 005. Waves and Beaches. Analysis of wind-generated waves in the open ocean and the changes that occur as waves enter shallow water, forming surf. The tides and seismic sea waves are discussed for comparison. Sec Max hours: 9 Credits. **Semester Hours:** 1 to 1

GEOG 1602 - Urban Studies and Planning

Surveys the process of urbanization, emphasizing the development of American cities, using Denver as an example. Topics covered include: evolution of metropolitan form/land use patterns, cultural landscape formation, city planning and architectural design, and urban social and policy issues. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2. **Semester Hours:** 3 to 3

GEOG 2080 - Introduction to Mapping and Map Analysis

Studies major elements in the preparation of thematic maps, including sources of data collection and manipulation of data, and cartographic techniques for display of data. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 2202 - Hazards to Disasters: Perception and Management

Surveys those physical phenomena that often cause substantial damage when they occur in areas of human settlement. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2. **Semester Hours:** 3 to 3

GEOG 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

GEOG 3100 - Geography of Colorado

An analysis of the physical environment, history of settlement, and resource base of Colorado in relation to present economic patterns of the state. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3110 - Geography of North America

Systematic study of the physical, cultural, economic, and political relationships that shape the landscape of the United States, Canada, Greenland, and the U.S.-Mexico Borderlands. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3120 - Geography of Europe

An analysis of the physical environment, resource utilization, economic development and cooperation in Europe. A cultural and political geography which focuses on continuity and change in Eastern and Western Europe. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3130 - Central America and the Caribbean

Surveys the physical environment and cultural development of Central America and the Caribbean Islands. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3140 - Geography of South America

The physical environment, cultural development, and political instability within the area are analyzed. Influence of the landscape and climate, as well as Iberian cultural and land tenure patterns on historic settlement and modern growth are discussed. Problems associated with population, economics, politics, education, and geography are emphasized. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3150 - Middle East

Physical, cultural, and economic approach to the arid lands of the Middle East, including Arab land of the Sahara. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3160 - Geography of China

Geographic survey of the physical, cultural, and economic features characterizing the geography of China. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3232 - Weather and Climate

Introduces the processes and systems that govern both day-to-day weather and longer-term climate variations. Covers instrumentation and weather forecasting techniques. Prereq: GEOG 1202 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3240 - Colorado Climates

Provides a broad overview of the various weather and climate patterns that are found within the state of Colorado. To accomplish this, the state of Colorado will be divided into regions which (hopefully) have a large degree of homogeneity in terms of weather and climate controls. Note: Taught in a seminar style with students giving presentations and reports on their findings about a given region. Prereq: GEOG 1202 and/or GEOG 3232 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3301 - Population and Resources in the World Environment

Increasing world human populations are examined in the context of regional and global resources. Opposing viewpoints are studied, and students are required to complete a case study of a self-selected issue analyzing viewpoints associated with relevant opposing opinions. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq: upper division standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3302 - Water Resources

Introduces water resources aimed at students with little or no background in the field. This is a broad course covering topics ranging from the physical aspects of water to water politics and international law. While the course is largely a lecture format, discussion of current issues is a significant part of the class. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3401 - Geography of Food and Agriculture

An overview of food systems and agriculture as they impact an increasingly urbanized planet. We will survey historical food production and preservation, food justice and insecurity, land-use and preservation, as well as local and global systems of distribution and consumption. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3411 - Globalization and Regional Development

Addresses global political-restructuring and its implications for regional development in the U.S. Both historical and contemporary processes of globalization are examined. Topics include: the environmental basis of American industrial growth, the relationship between technological change and geographical shifts, the rise and decline of Fordism, the transfer of Japanese manufacturing methods to the U.S., the role of regional and national industrial policy, and the social consequences of globalization for labor and communities. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3430 - Geography of Tourism

Geographic analysis of trends in recreation, travel, and tourism, and their economic, social, and environmental impacts. Examines growth and change in resorts and tourist destination areas. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq: GEOG 1302 or 3411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3440 - Ecotourism

The geographic study of a growing segment in contemporary tourism aimed at the provision of low impact travel to fragile, pristine and usually protected areas with the purpose of directly benefitting local communities and ecological conservation. The course surveys leading destination areas for ecotourism worldwide. GEOG 1302, GEOG 3411 or GEOG 3430 recommended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3501 - Geography of Health

Offers a critical geographic perspective to human health issues, examining disease distributions, how changing relationships between people and their environments (natural, built, and social environments) influence health, and different approaches to the study of health in geography. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3770 - Geography and Film

Geographic analysis of past and current film production and distribution systems and the complex relationships between film making and place in feature, documentary and educational film. Prereq: GEOG 1302 or 2411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 3840 - Independent Study: GEOG

Max hours: 6 Credits. **Semester Hours:** 1 to 3

GEOG 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

GEOG 3990 - Special Topics

Investigation of current topics in geography such as analysis of issues (crime, public transportation), techniques (socioeconomic impact analysis), or areas of specialization (climatology). Prereq: Vary with each topic, but no less than six hours in relevant social or physical science. Max hours: 9 Credits. **Semester Hours:** 3 to 3

GEOG 4000 - Planning Methods

Focuses on the application of statistical, quantitative, and mathematical techniques and computer applications for urban and regional planning and policy development. This course focuses on the most commonly applied quantitative and qualitative methods used in planning; data organization and management principles; and various ways to collect, analyze, and communicate data as a fundamental component of the planning process. Cross-listed with URPL 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4010 - Landscape Geochemistry

A holistic approach to studying the role chemical elements play in synthesis/decomposition cycles, and the resultant environment from interaction of the lithosphere with the hydrosphere, atmosphere, biosphere, and pedosphere during geological, and ecological timeframes, together with anthropogenic activities. Prereq: Introductory college-level physical geography or environmental science course or permission of instructor. Prereq: GEOG 1202 or GEOL 1072 or permission from instructor. Cross-listed with GEOL 4010/ENVS 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4020 - Earth Environments and Human Impacts

Basic concepts describing earth's biomes and physical environment are presented in a systems context. Global warming assessment, from both political and scientific perspectives, is then presented. Model visualization of these concepts to consider human impacts on Earth's biomes is discussed. Earth system viewpoint, having links of Earth's biomes to oceans and atmosphere, completes the course discussion. Prereq: GEOG 1202 and 3232 or permission of instructor. Cross-listed with ENVS 5020, GEOL 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4060 - Remote Sensing I: Introduction to Environmental Remote Sensing

An in-depth treatment of the use of aerial photographs and other forms of imagery for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Prereq: GEOG 2080 or permission of instructor. Cross-listed with GEOG 5060, GEOL 4060, GEOL 5060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4070 - Remote Sensing II: Advanced Remote Sensing

Focuses on digital image processing of satellite and aerial images. Students explore the nature of digital image data, gain an understanding of image analysis using PCs, and learn about the use of analysis products in the development of GIS databases. Prereq: GEOG 4060/5060 or GEOL 4060/5060 or permission of instructor. Cross-listed with GEOG 5070, GEOL 4070, 5070. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4080 - Introduction to GIS

Introduces Geographic Information Systems (GIS), including justification, hardware/software, database design, and data conversion. GIS is a computer-based mapping system providing a graphical interface to locational and relational attribute data. Includes hands-on use of a GIS workstation. Prereq: GEOG 2080. Cross-listed with GEOG 5080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4081 - Cartography and Computer Mapping

Provides an introduction to the art and science of cartography (map making). Students will learn about design principles, tools and techniques of map production, culminating in the creation of a high-quality map through hands-on exercises. Prereq: GEOG 4080 or GEOG 5080. Cross-listed with GEOG 5081. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4085 - GIS Applications for the Urban Environment

Takes a more detailed look at basic concepts presented in the introductory GIS course, concentrating on how GIS is used to solve real-world geographic problems. Various GIS applications within both the natural and social sciences are highlighted. The selection of specific topics is flexible, based on the interests of enrolled students. Prereq: GEOG 4080 or GEOG 5080 or permission of instructor. Cross-listed with GEOG 5085. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4090 - Environmental Modeling with Geographic Information Systems

Expands the basic knowledge of GIS to spatial models. Establishes a comprehensive framework that can be used to address a wide range of applications in natural and built environments. Prereq: GEOG 4080 or GEOG 5080 or permission of instructor. Cross-listed with GEOG 5090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4091 - Open Source Software for Geospatial Applications

Students will master the individual use and integration of a stack of the most powerful Free and Open Source Software for Geospatial Applications (FOSS4G) to analyze spatial problems and create Spatial Data Infrastructures in different technological, socio-economic and organizational settings. Prereq: GEOG 4080 or 5080 or equivalent course or permission of the instructor. Cross-listed with GEOG 5091. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4092 - GIS Programming and Automation

Students will learn the most commonly used programming language to automate GIS geoprocessing tasks and workflows in the latest versions of the most popular GIS systems. Cross-listed with GEOG 5092. Prereq: Prereq: grade of B- or higher in GEOG 4080 or 5080 or similar course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4095 - Deploying GIS Functionality on the Web

Covers the core principles and technologies that allow the deployment of geographic information system (GIS) functionality over the World Wide Web. Hands-on exercises make use of the latest commercial software as well as

open source technologies. Prereq: GEOG 4080 or GEOG 5080, computer science background, or permission of instructor. Cross-listed with GEOG 5095. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4150 - Place, Landscape, and Meaning

Investigates concepts that constitute place and landscape--how they are not just simply "there." Incorporates different schools of thought to help understand why landscapes are objects inseparable from us and open to multiple interpretations and meanings. Prereq: Introductory human geography or instructor permission. Cross-listed with GEOG 5150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4220 - Environmental Impact Assessment

The objective of this course is to provide the foundation for understanding the environmental impact assessment process, its legal context, and the criteria and methods for procedural and substantive compliance. Cross-listed with GEOG 5220, URPL 6549. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4230 - Hazard Mitigation and Vulnerability Assessment

Examines hazard mitigation and its planning and policy implications, emphasizing how vulnerability assessments play an integral role. Students explore how mitigation minimizes the impacts from hazards and use GIS to conduct a local study. Prereq: GEOG 2202 or permission of instructor. Cross-listed with GEOG 5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4235 - GIS Applications in the Health Sciences

Examines how GIS is used throughout the health care industry and public health. Covers environmental health, disease surveillance, and health services research. Students critically review current literature and gain hands-on experience with GIS software. Prereq: GEOG 4080 or GEOG 5080, public health background, or consent of instructor. Cross-listed with GEOG 5235, HBSC 7235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4240 - Applied Geomorphology

Uses hands-on tasks and field trips to investigate processes behind Earth's changing landforms in a variety of physical landscapes(aeolian, volcanic, coastal, fluvial, karst, glacial and periglacial) as related to rock decay, soils and climatic forcings. Prereq: GEOG 1202 or GEOL 1072 (required) and GEOG 3232 strongly recommended. Cross-listed with GEOL 4240, 5240 and GEOG 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4251 - Fluvial Geomorphology

Examines interactions between Earth's surface and flowing water across spatial and temporal scales. Considers structure and function of the major components of fluvial systems, with particular attention to the variety of fluvial systems to hydrologic, geologic and anthropogenic controls. Cross-listed with GEOG 5251, GEOL 4251 and GEOL 5251. Prereq: Students must have completed GEOG 1202 or GEOL 1072 or have graduate standing or gain instructor approval in order to register for this course. GEOG 3232 is strongly recommended, though not required. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOG 4260 - Energy and Natural Resource Planning

This course provides an overview of the issues associated with energy and natural resource planning. Topics include: energy policy; alternative energy development; water resources; extraction/mining; natural resource protection and regulation; resource management, policies, politics, and technologies. Cross-listed with URPL 6510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4265 - Sustainability in Resources Management

Sustainability and sustainable development are the dominant economic, environmental and social issues of the 21st century. Follows a multi-disciplinary approach to these concepts. Case studies demonstrate their implementation in different geographical, ecological and socio-economic conditions worldwide. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq: ENVS 1042 or permission of instructor. Cross-listed with GEOG 5265. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEOG 4270 - Glacial Geomorphology

Provides an in-depth view of the processes and systems found in glacial environments. Topics include: evidence of past glaciation; present-day glacial extent; glacier dynamics; glacial erosional processes and landforms; glacial depositional processes and landforms. Prereq: GEOG 1202 or GEOL 1072. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4280 - Environmental Hydrology

Examination of hydrologic processes in relation to climate, soils, vegetation, land-use practices, and human interactions. Natural scientific perspectives emphasized; field and laboratory included. Prereq: GEOG 1202 AND one of: 1) GEOG 3232; 2) GEOG 4240/GEOL 4240/GEOG 5240; 3) GEOG 4010/GEOL 4010/ENVS 5000. Cross-listed with GEOL 4280 and ENVS 5280. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOG 4335 - Contemporary Environmental Issues

Provides an overview of environmental challenges facing society today, focusing on how humans impact and change the environment. Opposing views and environmental policy at the local, state, national, and international levels are explored. Cross-listed with GEOG 5335. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEOG 4350 - Environment and Society in the American Past

Overview of the geographical development of North American society from the late 15th century to the mid-20th century. A comparative regional approach emphasizing relationships between natural resource exploitation, cultural landscape formation and environmental change. Cross-listed with GEOG 5350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4400 - Regional Economic Systems

This course offers a comprehensive investigation into regional economic systems; metropolitan economies; regional economic development; regional market assessment; job generation; taxes/spending; and fiscal/economic policies and impacts at the metropolitan, regional, and statewide scale. Cross-listed with URPL 6605. Max hours: 3 Credits.

Semester Hours: 3 to 3

GEOG 4420 - The Politics of Nature

Examines how economic systems, scientific discovery, institutional policies, and environmental knowledge converge to shape the environment and mediate the way societies understand, manage and respond to environmental changes in both the United States and the developing world. Cross-listed with GEOG 5420. Max hours: 3 Credits. **Semester**

Hours: 3 to 3

GEOG 4440 - Science, Policy and the Environment

Examines the social, economic and political forces shaping scientific discovery and the development and enforcement of environmental policy. Students will examine perspectives on issues such as risk, expertise, uncertainty and objectivity that influence the problem-defining, standard-setting and policy-making process. Cross-listed with GEOG 5440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4450 - Urban Food and Agriculture: Perspectives and Research

Provides an overview of research & practices in urban farming. Critically reviews emergent models of local food production/distribution. Compares new practices to traditional agribusiness. Assesses the prospects for solving sustainability problems within the modern agro-food system. Cross-list ENV5 5450. Max hours: 3 Credits. **Semester**

Hours: 3 to 3

GEOG 4460 - Sustainable Urban Agriculture Field Study I

Provides a field-based overview of urban farm planning & management. Topics: range/land conservation, native/invasive species, water distribution, animal husbandry, government interaction, local markets, community relations, conservation easements and issues pertaining to urban farming. Prerequisite GEOG 4450. Cross-list ENV5 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4470 - Sustainable Urban Agriculture Field Study II

Provides a field-based overview of current practices in local agricultural production. Emphasis will be placed on sustainable practices and their most efficient situation, Special consideration will be given to plausible solutions for food insecure communities both local and global. Prerequisite GEOG 4450, 4460. Cross-list ENV5 5470. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4480 - Urban Vegetable CSA: Planning, Production&Distribution

This course outlines the planning, production, and distribution in an active urban vegetable CSA (community supported

agriculture) model. It is offered as a part of the GES Sustainable Urban Agriculture Certificate. Cross-listed with ENV5 5480. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4630 - Transportation and Land Use

Examines basic concepts/methods in contemp. land use & transportation planning, incl. travel demand forecasting, traffic impact analysis, travel behavior, active transportation; & examples of transportation/land use interaction such as influence of built environments on travel & transit-oriented development. Cross-listed with URPL 6555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4640 - Urban Geography: Denver and the U.S.

Uses a combined lecture/seminar format to explore research themes in urban geography. Topics covered include both historical and contemporary processes of urban development and transformation. Particular emphasis is placed on the U.S. and Colorado's Front Range. Cross-listed with GEOG 5640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4670 - Transportation Planning and Policy

This course examines policy issues in urban transportation planning: how transportation system design and political/institutional contexts shape transportation decision-making; major modes of urban transportation; and the social, environmental, economic, energy, and health impacts of transportation systems. Cross-listed with URPL 6550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4680 - Urban Sustainability: Perspectives and Practice

Examines various perspectives on sustainability, including ambiguities and opportunities of sustainability as a conceptual framework. Class also examines what sustainability looks like in practice, using numerous topics such as poverty and urban farming to water and climate change. Cross-listed with GEOG 5680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4700 - Synthesis for Interdisciplinary Science

Synthesis is an approach in interdisciplinary research and education that links ideas, data and methods. This course develops synthesis skills through the lens of systems theory. It includes exercises for synthetic thinking, examination of integrative tools, and a service-learning project. Cross-listed with ENV5 5700. Breadth and depth training in environmental sciences. Interest in interdisciplinary collaboration. Senior standing required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4710 - Disasters, Climate Change, and Health

Provides a review of the impacts of disasters and climate change on human health, using a broad framework of preparedness, mitigation, response, recovery, and adaptation. Prereq: GEOG 2202 or GEOG 3501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4720 - Climate Change: Causes, Impacts and Solutions

Examines science behind past, present & future climate change & environmental, social & political implications & solutions. Explores recent scientific research, syntheses & mainstream literature advancing knowledge about causes & consequences of natural & anthropogenic climate change. Prereq: GEOG 3232. Cross-listed with GEOG 5720/ ENVS 4720/ ENVS 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4731 - Mountain Biogeography

This course utilizes the close proximity of the Rocky Mountains to examine altitudinal influences on species distributions. Topics include species patterns and distributions, disturbance, climate impacts, forest management and sustainability. Prereq: GEOG 1202 or ENVS 1042 or graduate standing or permission from the instructor is required in order to register for this course. Cross-listed with ENVS 5731. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4770 - Applied Statistics for the Natural Sciences

Surveys statistical techniques including: quick review of basic statistics, tests for normality and outliers, display of data; simple and multiple regression; ANOVA and its relation to regression. Emphasis on computer or stat-pak analysis and interpretation of statistical results. Prereq: College algebra and GEOG 2080, or consent of instructor. Cross-listed with ENVS 5600, GEOL 4770, 5770. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4840 - Independent Study: GEOG

Independent research primarily for undergraduate majors. Prereq: Permission of department. Max hours: 12 Credits. **Semester Hours:** 1 to 3

GEOG 4850 - Understanding And Communicating Field Methods

Interdisciplinary course that presents a balanced overview of common field methods and how to communicate them effectively to a general audience. Includes hands-on experience with various field methods (e.g., transects, survey design, historical assessment, GIS, etc.) and communication strategies. Prereq: Introductory geography or environmental science course, and graduate or advanced upper-level standing, or instructor permission. Cross-listed with GEOG 5850 and ENVS 4850/5850. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GEOG 4900 - Colloquium

Engages students and faculty in discussion of current and pertinent world topics, including specific readings, (guest)

presentations, and creation of working research papers, among other items. Students and faculty may work in research groups to accomplish specific goals. Prereq: Advanced Standing (undergrad). Cross-listed with ENVS 4900, ENVS 5900, GEOG 5900. Max hours: 4 Credits. **Semester Hours:** 1 to 1

GEOG 4940 - Senior Seminar

Introduces students to the professional literature in the field. Various professionals and faculty lecture about geography/planning research and careers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4950 - Honors Thesis

A capstone course designed to promote critical thinking, research methodology, and writing/oral presentation skills. Students design and develop a research project under the supervision of a faculty advisor. Each student gives an oral presentation or defense of his or her thesis at the end of the semester in which they enroll. Prereq: GEOG 4940 and junior or senior standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 4990 - Special Topics

Max hours: 9 Credits. **Semester Hours:** 3 to 3

GEOG 4992 - Advanced Regional Field Study

Directed, hands-on study of concepts involved in understanding geographic regions. Utilizes field observations, field techniques/methods, & data observation, collection, analysis, & interpretation related to the specific region being studied. May include physical as well as cultural phenomena. Note: Instructor permission required. Cross-listed with GEOG 5992, ENVS 4992, ENVS 5992. Max hours: 12 Credits. **Semester Hours:** 1 to 6

GEOG 4995 - Travel Study

Rigorous yet flexible fieldwork-based experience exploring geographical and environmental phenomena in diverse world locations. Course begins with intensive regional and methodological introductions, followed by on-location field investigations in environmental analyses, cultural studies, GIS applications, tourism evaluation and/or hazards assessment. Prereq: GEOG 1202 and GEOG 1302, or permission of instructor. Cross-listed with ENVS 4995, ENVS 5995, and GEOG 5995. Max hours: 12 Credits. **Semester Hours:** 3 to 9

GEOG 4998 - Geography By Rail

Systematic and geographic exploration of region(s) mainly via train, focused on creating broad understanding of peoples, cultures, and landscapes. This course represents an intensive, field-based experience that may encompass both physical and cultural characteristics of place and space. Prereq: GEOG 1202 and 1302, or equivalent as determined by instructor. Cross-listed with GEOG 5998 and ENVS 4998/5998. Max hours: 12 Credits. **Semester Hours:** 1 to 12

GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing

An in-depth treatment of the use of aerial photographs and other forms of imagery for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Cross-listed with GEOG 4060, GEOL 4060, GEOL 5060. Completion of GEOG 2080 with a C or better is recommended for optimal student success. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5070 - Remote Sensing II: Advanced Remote Sensing

Focuses on digital image processing of satellite and aerial images. Students explore the nature of digital image data, gain an understanding of image analysis using PCs, and learn about the use of analysis products in the development of GIS databases. Prereq: GEOG 5060/4060 or GEOL 5060/4060 or permission of instructor. Cross-listed with GEOG 4070, GEOL 5070, 4070. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5080 - Introduction to GIS

Introduces Geographic Information Systems (GIS), including justification, hardware/software, database design, and data conversion. GIS is a computer-based mapping system providing a graphical interface to locational and relational attribute data. Includes hands-on use of a GIS workstation. Cross-listed with GEOG 4080. Completion of GEOG 2080 with a C or better is recommended for optimal student success. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5081 - Cartography and Computer Mapping

Provides an introduction to the art and science of cartography (map making). Students will learn about design principles, tools and techniques of map production, culminating in the creation of a high-quality map through hands-on exercises. Prereq: GEOG 4080 or GEOG 5080. Cross-listed with GEOG 4081. Note: Completion of GEOG 2080 with a C or better is recommended for optimal student success. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5085 - GIS Applications for the Urban Environment

Takes a more detailed look at basic concepts presented in the introductory GIS course, concentrating on how GIS is used to solve real-world geographic problems. Various GIS applications within both the natural and social sciences are highlighted. The selection of specific topics is flexible, based on the interests of enrolled students. Prereq: GEOG 4080 or GEOG 5080 or permission of instructor. Cross-listed with GEOG 4085. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5090 - Environmental Modeling with Geographic Information Systems

Expands the basic knowledge of GIS to spatial models. Establishes a comprehensive framework that can be used to address a wide range of applications in natural and built environments. Prereq: GEOG 4080 or GEOG 5080 or permission of instructor. Cross-listed with GEOG 4090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5091 - Open Source Software for Geospatial Applications

Students will master the individual use and integration of a stack of the most powerful Free and Open Source Software

for Geospatial Applications (FOSS4G) to analyze spatial problems and create Spatial Data Infrastructures in different technological, socio-economic and organizational settings. Prereq: GEOG 4080 or 5080 or equivalent course or permission of the instructor. Cross-listed with GEOG 4091. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5092 - GIS Programming and Automation

Students will learn the most commonly used programming language to automate GIS geoprocessing tasks and workflows in the latest versions of the most popular GIS systems. Cross-listed with GEOG 4092. Prereq: grade of B- or higher in GEOG 4080 or 5080 or similar course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5095 - Deploying GIS Functionality on the Web

Covers the core principles and technologies that allow the deployment of geographic information system (GIS) functionality over the World Wide Web. Hands-on exercises make use of the latest commercial software as well as open source technologies. Prereq: GEOG 4080 or GEOG 5080, computer science background, or permission of instructor. Cross-listed with GEOG 4095. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5150 - Place, Landscape, and Meaning

Investigates concepts that constitute place and landscape--how they are not just simply "there." Incorporates different schools of thought to help understand why landscapes are objects inseparable from us and open to multiple interpretations and meanings. Prereq: Introductory human geography or graduate standing. Cross-listed with GEOG 4150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5220 - Environmental Impact Assessment

The objective of this course is to provide the foundation for understanding the environmental impact assessment process, its legal context, and the criteria and methods for procedural and substantive compliance. Cross-listed with GEOG 4220, URPL 6549. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5230 - Hazard Mitigation and Vulnerability Assessment

Examines hazard mitigation and its planning and policy implications, emphasizing how vulnerability assessments play an integral role. Students explore how mitigation minimizes the impacts from hazards and use GIS to conduct a local study. Prereq: GEOG 2202 or permission of instructor. Cross-listed with GEOG 4230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5235 - GIS Applications in the Health Sciences

Examines how GIS is used throughout the health care industry and public health. Covers environmental health, disease surveillance, and health services research. Students critically review current literature and gain hands-on experience with GIS software. Prereq: GEOG 4080 or GEOG 5080, public health background, or consent of instructor. Cross-listed with GEOG 4235, HBSC 7235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5240 - Applied Geomorphology

Uses hands-on tasks and field trips to investigate processes behind Earth's changing landforms in a variety of physical landscapes (aeolian, volcanic, coastal, fluvial, karst, glacial and periglacial) as related to rock decay, soils and climatic forcings. Prereq: GEOG 1202 or GEOL 1072 and GEOG 3232. Cross-listed with GEOL 4240, 5240 and GEOG 4240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5251 - Fluvial Geomorphology

Examines interactions between Earth's surface and flowing water across spatial and temporal scales. Considers structure and function of the major components of fluvial systems, with particular attention to the variety of fluvial systems to hydrologic, geologic and anthropogenic controls. Cross-listed with GEOG 4251, GEOL 4251 and GEOL 5251. Prereq: Students must have completed GEOG 1202 or GEOL 1072 or have graduate standing or gain instructor approval in order to register for this course. GEOG 3232 is strongly recommended, though not required. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOG 5265 - Sustainability in Resources Management

Sustainability and sustainable development are the dominant economic, environmental and social issues of the 21st century. Follows a multi-disciplinary approach to these concepts. Case studies demonstrate their implementation in different geographical, ecological and socio-economic conditions worldwide. Prereq: ENVS 1042 or permission of instructor. Cross-listed with GEOG 4265. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEOG 5270 - Glacial Geomorphology

Provides an in-depth view of the processes and systems found in glacial environments. Topics include: evidence of past glaciation; present-day glacial extent; glacier dynamics; glacial erosional processes and landforms; glacial depositional processes and landforms. Prereq: GEOG 1202 or GEOL 1072. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5335 - Contemporary Environmental Issues

Provides an overview of environmental challenges facing society today, focusing on how humans impact and change the environment. Opposing views and environmental policy at the local, state, national, and international levels are explored. Cross-listed with GEOG 4335. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 3

GEOG 5350 - Environment and Society in the American Past

Overview of the geographical development of North American society from the late 15th century to the mid-20th century. A comparative regional approach emphasizing relationships between natural resource exploitation, cultural landscape formation and environmental change. Cross-listed with GEOG 4350. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5420 - The Politics of Nature

"Examines how economic systems, scientific discovery, institutional policies, and environmental knowledge converge to shape the environment and mediate the way societies understand, manage and respond to environmental changes in both the United States and the developing world. Cross-listed with GEOG 4420. Prereq: Graduate standing. Max hours: 3 Credits." **Semester Hours:** 3 to 3

GEOG 5440 - Science, Policy and the Environment

Examines the social, economic and political forces shaping scientific discovery and the development and enforcement of environmental policy. Students will examine perspectives on issues such as risk, expertise, uncertainty and objectivity that influence the problem-defining, standard-setting and policy-making process. Cross-listed with GEOG 4440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5640 - Urban Geography: Denver and the U.S.

Uses a combined lecture/seminar format to explore research themes in urban geography. Topics covered include both historical and contemporary processes of urban development and transformation. Particular emphasis is placed on the U.S. and Colorado's Front Range. Cross-listed with GEOG 4640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5680 - Urban Sustainability: Perspectives and Practice

Examines various perspectives on sustainability, including ambiguities and opportunities of sustainability as a conceptual framework. Class also examines what sustainability looks like in practice, using numerous topics such as poverty and urban farming to water and climate change. Cross-listed with GEOG 4680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5710 - Disasters, Climate Change, and Health

Provides a review of the impacts of disasters and climate change on human health, using a broad framework of preparedness, mitigation, response, recovery, and adaptation. Prereq: GEOG 2202 or GEOG 3501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5720 - Climate Change: Causes, Impacts and Solutions

Examines science behind past, present & future climate change & environmental, social & political implications & solutions. Explores recent scientific research, syntheses & mainstream literature advancing knowledge about causes & consequences of natural & anthropogenic climate change. Cross-listed with GEOG 4720/ ENVS 4720/ ENVS 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5840 - Independent Study

Section 1, economic; 2, physical; 3, urban; 4, social; 5, quantitative; 6, transportation. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOG 5850 - Understanding And Communicating Field Methods

Interdisciplinary course that presents a balanced overview of common field methods and how to communicate them effectively to a general audience. Includes hands-on experience with various field methods (e.g., transects, survey design, historical assessment, GIS, etc.) and communication strategies. Prereq: Introductory geography or environmental science course, and graduate or advanced upper-level standing, or instructor permission. Cross-listed with GEOG 4850 and ENVS 4850/5850. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GEOG 5900 - Colloquium

Engages students and faculty in discussion of current and pertinent world topics, including specific readings, (guest) presentations, and creation of working research papers, among other items. Students and faculty may work in research groups to accomplish specific goals. Prereq: graduate student status. Cross-listed with ENVS 4900, ENVS 5900, GEOG 4900. Max hours: 4 Credits. **Semester Hours:** 1 to 1

GEOG 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

GEOG 5990 - Special Topics In Geography

Course content varies from semester to semester, depending on faculty member teaching the course. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GEOG 5992 - Advanced Regional Field Study

Directed, hands-on study of concepts involved in understanding geographic regions. Utilizes field observations, field techniques/methods, & data observation, collection, analysis, & interpretation related to the specific region being studied. May include physical as well as cultural phenomena. Note: Instructor permission required. Cross-listed with GEOG 4992, ENVS 4992, ENVS 5992. Max hours: 12 Credits. **Semester Hours:** 1 to 6

GEOG 5995 - Travel Study

Rigorous yet flexible fieldwork-based experience exploring geographical and environmental phenomena in diverse world locations. Course begins with intensive regional and methodological introductions, followed by on-location field investigations in environmental analyses, cultural studies, GIS applications, tourism evaluation and/or hazards

assessment. Prereq: GEOG 1202 and GEOG 1302, or permission of instructor. Cross-listed with ENVS 4995, ENVS 5995, and GEOG 4995. Max hours: 12 Credits. **Semester Hours:** 3 to 9

GEOG 5998 - Geography By Rail

Systematic and geographic exploration of region(s) mainly via train, focused on creating broad understanding of peoples, cultures, and landscapes. This course represents an intensive, field-based experience that may encompass both physical and cultural characteristics of place and space. Prereq: GEOG 1202 and 1302, or equivalent as determined by instructor. Cross-listed with GEOG 4998 and ENVS 4998/5998. Max hours: 12 Credits. **Semester Hours:** 1 to 12

GEOG 6300 - Foundations Seminar in Human-Environmental Interaction

This seminar allows students to gain a deeper appreciation for historical and contemporary geographical approaches to understanding the relationship between society and the environment through a survey review of seminal concepts, theories and debates that have shaped the discipline. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 6700 - Integrated Methods

Geographers employ a variety of quantitative and qualitative methods in their research. The course presents these methods as a continuum, rather than separate typologies, and reviews the difference between integrated and mixed methods. Students will evaluate how and when to apply various methods to most appropriately elicit data. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 6750 - Research Design

Reviews research framework common to all geographers. Reviews the key steps in designing and executing high-caliber independent research, including topic selection, literature review and data collection analysis. Students will develop competence in applying relevant theories from the natural and social sciences through projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 6800 - Community-Based Research Practicum

For students to apply the concepts and skills presented throughout the masters program in a community setting. Students will participate in a real-world, studio-based project that meets the needs of a government, non-governmental, or private sector organization and will produce a scoped product. Prereq: Must be graduate level and have completed ENVS 6002, ENVS 6004 and ENVS 6100. Cross-list ENVS 6800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOG 6840 - Independent Study: GEOG

Independent research for graduate major students. Prereq: Permission of department. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOG 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 6 to 6

GEOG 8990 - Doctor's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

GEOL 1022 - History of Life

Non-technical study of fossils through time and their relationships to environments through earth history. Includes discussion of evolution and extinction events and current controversies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 1072 - Physical Geology: Surface Processes

Introductory course in physical geology that covers surface processes and landforms, and includes one all-day field trip. Note: Required for geology majors. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 4 to 4

GEOL 1082 - Physical Geology: Internal Processes

Introductory course in physical geology that covers internal processes and properties of the earth's interior, with plate tectonics as the underlying theme. Includes one all-day field trip. Note: Required for geology majors. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 4 to 4

GEOL 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOL 1115 - Earth Sciences Content

Covers content areas of undergraduate earth sciences. Topics include physical geology; historical geology; oceanography; meteorology; and astronomy. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOL 1202 - Introduction to Oceanography

Surveys modern scientific knowledge of the world's oceans. Intended for non-science students, the course offers a non-quantitative introduction to the major facts and principles of physical, chemical, biological, and geological oceanography. The impact of natural and anthropic events on the marine environment are included. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 1400 - Geology of the National Parks

Combines lecture and laboratory exercises to help students interpret Earth history using the national parks as examples. Students learn to identify the common rocks and minerals, and how to interpret topographic and geologic maps. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 1840 - Independent Study: GEOL

Max hours: 3 Credits. **Semester Hours:** 1 to 3

GEOL 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

GEOL 3011 - Mineralogy

Principles of mineralogy, including crystallography, crystal chemistry, and a systematic study of the more important nonsilicate and silicate minerals. Origins and occurrences of minerals. Prereq: Physical geology and college-level chemistry. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 3032 - Geology of Colorado

Introductory course focused on the geology of Colorado. The course is divided into two parts: the first half covers general principles of geology, and the second is devoted to the observation of rock types, structures, and geologic relationships in the field. Discussion of plate tectonics, rock formation, construction and interpretation of geologic maps, the geologic time scale, geologic provinces of Colorado, evolution of major landforms, formation and development of mineral resources of Colorado, and current topics in environmental geology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 3102 - Dinosaurs Past and Present

A broad-based, non-technical new look at the world's most popular prehistoric animals. Stresses the rapid and perennial growth of knowledge about dinosaurs and the relevance of such knowledge in the 20th century. Prereq: Introductory geology and/or biology are recommended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 3411 - Introductory Paleontology

Studies invertebrate fossils, including a survey of the organic world and its history in the geological past. Includes an introduction to evolution and paleoecology, and discussion of the uses of fossils in geologic correlations. Prereq: Introductory geology-surface processes, or an introductory biology class. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 3421 - Sedimentation and Stratigraphy

Introduces the principles of sedimentology and stratigraphy. Emphasis is on dynamic processes within sedimentary environments and the resulting stratigraphic record. Prereq: GEOL 1082 or equivalent. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 3840 - Independent Study: GEOL

Max hours: 6 Credits. **Semester Hours:** 1 to 3

GEOL 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

GEOL 4010 - Landscape Geochemistry

A holistic approach to studying the role chemical elements play in synthesis/decomposition cycles, and the resultant environment from interaction of the lithosphere with the hydrosphere, atmosphere, biosphere, and pedosphere during geological, and ecological timeframes, together with anthropogenic activities. Prereq: GEOG 1202 or GEOL 1072 or permission of instructor. Cross-listed with GEOG 4010/ENVS 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4020 - Earth Environments and Human Impacts

Basic concepts describing earth's biomes and physical environment are presented in a systems context. Global warming assessment, from both political and scientific perspectives, is then presented. Model visualization of these concepts to consider human impacts on Earth's biomes is discussed. Earth system viewpoint, having links of Earth's biomes to oceans and atmosphere, completes the course discussion. Cross-listed with ENVS 5020, GEOG 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4030 - Environmental Geology

Applies geological information to interactions between people and the physical environment. Increasing awareness of its importance in our society means that this is an expanding field as companies are required to address the environmental consequences of their actions. Prereq: Entry into MSES program, senior standing in sciences or geography, or permission of instructor. Cross-listed with ENVS 5030 and GEOL 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4060 - Remote Sensing I: Introduction to Environmental Remote Sensing

An in-depth treatment of the use of aerial photographs and other forms of imagery for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Prereq: GEOG 3080 or consent of instructor. Cross-listed with GEOL 5060, GEOG 4060, 5060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4111 - Field Methods In Geology

Introduction to the basic methods of geologic mapping (metamorphic, sedimentary, and igneous rocks), including use of the Brunton compass and Jacob Staff, as well as preparation of measured stratigraphic sections, geologic maps, and geologic cross-sections. Prereq: GEOL 1072 or GEOG 1202, GEOL 3421 strongly recommended. Cross-listed with GEOL 5111. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4240 - Applied Geomorphology

Uses hands-on tasks and field trips to investigate processes behind Earth's changing landforms in a variety of physical landscapes (aeolian, volcanic, coastal, fluvial, karst, glacial and periglacial) as related to rock decay, soils and climatic forcings. Prereq: GEOG 1202 or GEOL 1072 (required) and GEOG 3232 strongly recommended. Cross-listed with GEOG 4240, 5240 and GEOL 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4251 - Fluvial Geomorphology

Examines interactions between Earth's surface and flowing water across spatial and temporal scales. Considers structure and function of the major components of fluvial systems, with particular attention to the variety of fluvial systems to hydrologic, geologic and anthropogenic controls. Cross-listed with GEOG 4251, GEOG 5251 and GEOL 5251. Prereq: Students must have completed GEOG 1202 or GEOL 1072 or have graduate standing or gain instructor approval in order to register for this course. GEOG 3232 is strongly recommended, though not required. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 4270 - Glacial Geomorphology

Provides an in-depth view of the processes and systems found in glacial environments. Topics include: evidence of past glaciation; present-day glacial extent; glacier dynamics; glacial erosional processes and landforms; glacial depositional processes and landforms. Prereq: GEOG 1202 or GEOL 1072. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4280 - Environmental Hydrology

Examination of hydrologic processes in relation to climate, soils, vegetation, land-use practices, and human interactions. Natural scientific perspectives emphasized; field and laboratory included. Prereq: GEOG 1202 and one of: 1) GEOG 3232; 2) GEOG 4240/GEOL 4240/GEOG 5240; 3) GEOG 4010/GEOL 4010/ENVS 5000. Cross-listed with GEOG 4280 and ENVS 5280. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 4402 - Unsaturated Zone Hydrology

Focuses on water and contaminant transport through the unsaturated zone, infiltration and drainage, and heat and gas transport. Students learn to design, perform field installation, and collect data in order to model and predict contaminant movement on/off site. Prereq: Chemistry, physics, calculus or permission of instructor. Cross-listed with ENVS 5403. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4513 - Geology of the Grand Canyon

Raft down the Grand Canyon and examine the geology of igneous, sedimentary, and metamorphic rocks from the Precambrian to the Holocene. Study marine and terrestrial fossils, migmatization and observe modern sedimentary processes. Prereq: GEOL 1072 or 1082. Cross-listed: ENVS 5513. Max hours: 5 Credits. **Semester Hours:** 3 to 5

GEOL 4770 - Applied Statistics for the Natural Sciences

Surveys statistical techniques including: quick review of basic statistics, tests for normality and outliers, display of data; simple and multiple regression; Anova and its relation to regression. Emphasis on computer or stat-pak analysis and interpretation of statistical results. Prereq: College algebra and GEOG 3080, or consent of instructor. Cross-listed with GEOL 5770, GEOG 4770, ENVS 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 4780 - Engineering Geology

Studies geology as utilized in engineering and environmental practice. Emphasizes a conceptual integration of geologic materials, processes, and rates of change as a basis for successful application of geologic knowledge to environmental planning and engineering design projects. Prereq: MATH 2411 and CVEN 2121. Cross-listed with GEOL 5780 and CVEN 4780. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 4840 - Independent Study: GEOL

Max hours: 12 Credits. **Semester Hours:** 1 to 3

GEOL 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GEOL 4995 - Travel Study

Fieldwork- and research-based experience studying a diverse selection of geologic settings worldwide. Students individually research geologic areas of interest in an assigned region, followed by on-location field investigations and measurements of geologic data and phenomena. Note: Topics vary depending on region under study, student interest, and faculty specialty. Prereq: GEOL 1072 and 1082, or permission of instructor. Cross-listed with GEOL 5995. Max hours: 12 Credits. **Semester Hours:** 3 to 9

GEOL 5001 - RM-MSMSP: Earth Processes I

Systematic study of geological concepts, rock and mineral formation, plate tectonics, volcanism and earthquakes, landforms and weathering, historical environmental interpretation. Includes a field component. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: Permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 5002 - RM-MSMSP: Earth Sciences II - Sedimentology and Paleontology

Field and lecture course building on Earth Sciences I, which covers internal earth processes. Students learn about erosional processes and how sedimentary rocks are deposited and may be preserved; the different ways fossils are preserved; describing rocks in the field; and collecting, preparing and describing fossils. Provides an overview of the geology of the area so that students can place the detailed studies in context. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: GEOL 5001 (or equivalent) or permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 5003 - RM-MSMSP: Earth Science in Context

Designed for teachers in the RM-MSMSP program. Topics include global climate change, glaciers, coastal geology, volcanism, and their effects on culture. Monuments such as Florissant Fossil Beds, Ice Core, Cave of the Winds and a quarry will be visited. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 5004 - RM-MSMSP Research Experience for Teachers - Geology Cohort

A five-week research exploration in which RM-MSMSP teachers will raise their level of relevant scientific understanding by engaging in a "hands-on" workshop, transforming what they have learned into new curricular materials that will improve the scientific abilities of their students and hopefully stimulate them to consider a STEM career. Note: credit may not apply toward any CLAS degree. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GEOL 5030 - Environmental Geology

Applies geological information to interactions between people and the physical environment. Increasing awareness of its importance in our society means that this is an expanding field as companies are required to address the environmental consequences of their actions. Prereq: Entry into MSES program, senior standing in sciences or geography, or permission of instructor. Cross-listed with GEOL 4030 and ENVS 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing

An in-depth treatment of the use of aerial photographs and other forms of imagery for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Prereq: GEOG 3080 or consent of instructor. Cross-listed with GEOL 4060, GEOG 4060, 5060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 5111 - Field Methods in Geology

Introduction to the basic methods of geologic mapping (metamorphic, sedimentary, and igneous rocks), including use of the Brunton compass and Jacob Staff, as well as preparation of measured stratigraphic sections, geologic maps, and geologic cross-sections. Prereq: GEOL 1072 or GEOG 1202, GEOL 3421 strongly recommended. Cross-listed with GEOL 4111. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 5240 - Applied Geomorphology

Uses hands-on tasks and field trips to investigate processes behind Earth's changing landforms in a variety of physical landscapes(aeolian, volcanic, coastal, fluvial, karst, glacial and periglacial) as related to rock decay, soils and climatic forcings. Prereq: GEOG or GEOL 1072 and GEOG 3232. Cross-listed with GEOG 4240, 5240 and GEOL 4240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 5251 - Fluvial Geomorphology

Examines interactions between Earth's surface and flowing water across spatial and temporal scales. Considers structure and function of the major components of fluvial systems, with particular attention to the variety of fluvial systems to hydrologic, geologic and anthropogenic controls. Cross-listed with GEOG 4251, GEOG 5251 and GEOL 4251. Prereq: Students must have completed GEOG 1202 or GEOL 1072 or have graduate standing or gain instructor approval in order to register for this course. GEOG 3232 is strongly recommended, though not required. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 5270 - Glacial Geomorphology

Provides an in-depth view of the processes and systems found in glacial environments. Topics include: evidence of past glaciation; present-day glacial extent; glacier dynamics; glacial erosional processes and landforms; glacial depositional processes and landforms. Prereq: GEOG 1202 or GEOL 1072. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 5770 - Applied Statistics for the Natural Sciences

Surveys statistical techniques including: quick review of basic statistics, tests for normality and outliers, display of data; simple and multiple regression; Anova and its relation to regression. Emphasis on computer or stat-pak analysis and interpretation of statistical results. Prereq: College algebra and GEOG 3080, or consent of an instructor. Cross-listed with GEOL 4770, GEOG 4770, ENVS 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GEOL 5780 - Engineering Geology

Studies geology as utilized in engineering and environmental practice. Emphasizes a conceptual integration of geologic materials, processes, and rates of change as a basis for successful application of geologic knowledge to environmental planning and engineering design projects. Cross-listed with GEOL 4780 and CVEN 5780. Max hours: 4 Credits. **Semester Hours:** 4 to 4

GEOL 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GEOL 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

GEOL 5950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

GEOL 5995 - Travel Study

Fieldwork- and research-based experience studying a diverse selection of geologic settings worldwide. Students individually research geologic areas of interest in an assigned region, followed by on-location field investigations and measurements of geologic data and phenomena. Note: Topics vary depending on region under study, student interest, and faculty specialty. Prereq: GEOL 1072 and 1082, or permission of instructor. Cross-listed with GEOL 4995. Max hours: 12 Credits. **Semester Hours:** 3 to 9

GEOL 6840 - Independent Study: GEOL

Max hours: 9 Credits. **Semester Hours:** 1 to 3

GEOL 6950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

GEOL 6960 - Master's Project

Max hours: 8 Credits. **Semester Hours:** 1 to 8

GREK 1010 - Greek I: Biblical

Intended for students of languages, religious studies, and philosophy. Introduces the forms and syntax of Greek so that in the 13th week students will be able to read about 85% of the New Testament in the original language. Cross-listed with RLST 1010. Max hours: 5 Credits. **Semester Hours:** 5 to 5

GREK 1020 - Greek II: Biblical

A continuation of 1st-semester Biblical and Classical Greek. Covers the remaining forms and syntax of the textbook, with an emphasis on sight-reading passages from the New Testament. At the end of the course we will read, translate and study short fragments and lines written by some Pre-Socratic philosophers such as Thales, Anaxagoras, Anaximander, Heraclitus, and Parmenides. Prereq: GREK 1010. Max hours: 5 Credits. **Semester Hours:** 5 to 5

GREK 2110 - Greek III: Classical

Introduction to classical Greek, followed by reading of Plato's "Apology" with selections from "Pre-Socratic philosophers" (e.g. Xenophanes of Colophon, Zeno of Elea, Pythagoras) and Aristotle. Prereq: GREK 1020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 1000 - Germany and the Germans

Introduces the ways in which the various aspects of German culture help define German life and national identity. By examining art, music and media, primarily of the 20th century, students explore what it means to be German. Note: Taught in English. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1. **Semester Hours:** 3 to 3

GRMN 1010 - Beginning German I

Introduces basic grammar, sentence structure and speech patterns. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Max hours: 5 Credits. **Semester Hours:** 5 to 5

GRMN 1020 - Beginning German II

(Continuation of GRMN 1010.) Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed GRMN 1010 or equivalent, or have taken one year of high school German, or possess equivalent proficiency. A grade of C- or higher in GRMN 1010 is recommended for success in this course. This course is not intended for native speakers. Max hours: 5 Credits. **Semester Hours:** 5 to 5

GRMN 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

GRMN 1995 - Travel Study

Students study various topics at an off-campus location, either a foreign country or another city or region in the United States, led by a Downtown Denver Campus instructor. Max hours: 15 Credits. **Semester Hours:** 1 to 15

GRMN 2110 - Intermediate German I

(Continuation of German 1020.) Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed GRMN 1020 or equivalent, or have taken two years of high school German, or possess equivalent proficiency. A grade of C- or higher in GRMN

1020 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits.
Semester Hours: 3 to 3

GRMN 2130 - Intermediate German II

A fourth-semester course designed for those majoring or minoring in International Affairs. Along with grammar review, the course deals with contemporary topics in cultural, political, economic and social affairs. Note: Open to all those wanting to satisfy a fourth semester language requirement to qualify for upper division German courses. Satisfies the language requirement for the minor in International Affairs, may be applied to the major and minor in German, and will satisfy the fourth-semester foreign requirement at most graduate schools. Note: This course assumes that students have passed GRMN 2110 or equivalent, or have taken three years of high school German, or possess equivalent proficiency. A grade of C- or higher in GRMN 2110 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 2150 - Intermediate German II: Grammar Review and Oral Practice

Prepares students for upper division. German language skills courses. Students practice abilities gained in previous semesters of language instruction, improve conversational abilities, develop skills using reference works, learn tactics for reading and discussing newspaper style German and develop written composition abilities. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Taught in German. Note: This course assumes that students have passed GRMN 2110 or equivalent, or have taken three years of high school German, or possess equivalent proficiency. A grade of C- or higher in GRMN 2110 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 2210 - Readings and Translation

Stresses reading and translation skills rather than speaking. Students work with short German texts in a variety of areas: natural and social sciences, history and literature. Note: Taught in English. Prereq: GRMN 1020. Max hours: 3 Credits.
Semester Hours: 3 to 3

GRMN 2240 - Intermediate Composition and Vocabulary Building

A fourth-semester composition and vocabulary building course. Note: Taught in English. Note: This course assumes that students have passed GRMN 2110 or 2210 or equivalent, or possess equivalent proficiency. Max hours: 3 Credits.
Semester Hours: 3 to 3

GRMN 2840 - Independent Study: GRMN

Max hours: 3 Credits. **Semester Hours:** 1 to 3

GRMN 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Sophomore standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

GRMN 2995 - Travel Study

For students doing travel study in Germany; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

GRMN 3030 - Advanced Conversation: Idioms and Vocabulary Building

An advanced conversation course, using small-group discussion, skits, and short oral presentations to improve fluency in spoken German and to build vocabulary. Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3050 - Phonetics and Pronunciation of German

Students acquire skills for articulating German with a high degree of accuracy, and systematically develop a more native-like pronunciation of German. Students learn basic linguistic principles for the purpose of gaining insight into the mechanics of spoken German. Note: Taught in German. Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3060 - Advanced German Language Skills I

An advanced course in German language skills with equal emphasis devoted to speaking, listening, reading and writing. Students improve their cultural awareness, pronunciation, and vocabulary as well. Specific grammar topics include: subjunctive I and II, participles I and II, extended adjectives, verb tenses, gender of nouns, and reflexive. Note: Primary language of instruction for this course is German. Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3070 - Advanced German Language Skills II

An advanced course in German language skills with equal emphasis devoted to speaking, listening, reading and writing. Students improve their cultural awareness, pronunciation and vocabulary. Specific grammar topics include: semantic categories, functions of nouns, determiners, adjectives, relative clauses, pronouns. Note: Primary language of instruction for this course is German. Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3080 - Advanced German Language Skills III

An advanced course in German language skills with equal emphasis devoted to speaking, listening, reading and

writing. Students improve their cultural awareness, pronunciation, and vocabulary as well. Specific grammar topics include: prepositions and idioms, "da" compounds, German syntax, clause typology numerals, and time expressions. Note: Primary language of instruction for this course is German. Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3090 - Advanced German Language Skills IV

An advanced course in German language skills with equal emphasis devoted to speaking, listening, reading, and writing. Students improve their cultural awareness, pronunciation and vocabulary. Specific grammar topics include: modal verbs, complex clause and sentence structure, "werden," passive voice, double infinitives, perfect infinitives, and dependent infinitives. Note: Primary language of instruction for this course is German. Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3110 - Introduction to German Literature I

Selected readings from German short stories, drama, and poetry, primarily from the modern period. Emphasis on techniques of reading. Note: Primary language of instruction for this course is German. Note: This course assumes that students have passed GRMN 2110 or equivalent, or have taken three years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3130 - Current Topics of the German-Speaking World

Combines discussion and writing on political, economic, and social conditions in contemporary Germany, Austria and Switzerland. Articles from current German newspapers, magazines, television broadcasts, and the World Wide Web are analyzed for a better understanding of how citizens of these countries see themselves and the world. Note: This course assumes that students have passed a third-year German course, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3200 - Current German Society and Culture

Provides students with a detailed overview of the systems in modern, united Germany such as social, educational, and political. Examines how Germany sees itself as a vital member of the EU. Exposes students to rudimentary use of the German language. Prereq: Sophomore standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3230 - German Civilization I: From Medieval Through Age of Idealism

Selected highlights of major cultural aspects of the Middle Ages, the Reformation, the Enlightenment, and the Age of Idealism. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3240 - German Civilization II: The Modern Age

Selected highlights of major cultural aspects of the later 19th century, the Wilhelminian period, the Weimar Republic, the Third Reich, and the period since 1945. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3310 - Techniques of Translation

Trains students in strategic translation skills that aid in rapid comprehension of short German texts and the ability to render them into well written contemporary English. Students choose content areas of individual interest (e.g. history, literature, chemistry). Note: This course assumes that students have passed GRMN 2130 or equivalent, or have taken four years of high school German, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3512 - Faust in Literature and Music

Surveys the Faust legend in literature and music. Includes works by Marlowe, Goethe, Berlioz, Schumann, Gounod, Boito and others. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3540 - German Cinema and Society

Studies several key German films from 1918 to the present that illuminate the political/cultural discourses of their times. Readings from historical and film-critical texts aid in contextualizing the films. Note: Taught in English. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 3840 - Independent Study: GRMN

Max hours: 6 Credits. **Semester Hours:** 1 to 3

GRMN 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

GRMN 3995 - Travel Study

For students doing travel study in Germany; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

GRMN 4050 - Advanced German Phonetics and Language History

Students develop advanced phonetic skills for analyzing the sounds and orthography of German. They apply these skills by examining the diachronic (historic) developments in the grammatical and phonological structures of German over the last two millennia. Note: Taught in German. Note: This course assumes that students have passed GRMN 3050 or equivalent, or possess equivalent proficiency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

GRMN 4840 - Independent Study: GRMN

Max hours: 12 Credits. **Semester Hours:** 1 to 3

GRMN 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GRMN 4995 - Travel Study

For students doing travel study in Germany; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

GRMN 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

GRMN 5995 - Travel Study

For students doing travel study in Germany; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

HBSC 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HBSC 5020 - Global Health: Comparative Public Health Systems

Within a limited period of time, middle and low income countries have experienced dramatic changes that affect the length and quality of peoples' lives. The health indicators for each country reflect a rich and meaningful context within interacting systems of economic, social, cultural patterns, and environmental and social justice. Analysis and contrast of public health indicators such as the millennium development goals develop an understanding of the complexity against a background of change. Prereq: Upper division and/or graduate standing. Cross-listed with HBSC 4020 and PBHL 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5021 - Community Health Assessment

Introduces applied methods of public health, including: analyzing community-level assessment data, developing a casual model for selected health outcomes, maximizing community participation in the assessment process, developing assessments as a team, and setting the stage for effective intervention and evaluation. Prereq: Upper division standing, a

course in statistics, and an introductory course in epidemiology (HBSC 5001, 4001). Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5031 - Ethnographic Research in Public Health

Qualitative, ethnographic tools for practical applications in public health, including methods of direct observation, informant interviews, focus groups, structured ethnographic methods, rapid assessment and participatory action research. Basic analytic strategies, including review of computer software, coding and data display techniques. Cross-listed with PBHL 4031. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5040 - Social Determinants of Health

This course explores social inequalities in physical and mental health, the illness experience, the healing professions, health policy, relations between providers and patients, and the structure, access to, and financing of health care organizations, with some cross-national discussions. Prereq: Graduate standing. Cross-listed with PBHL 4040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5060 - Evolutionary Medicine

Evolutionary medicine is a relatively new approach for understanding patterns of human health and disease. In this course, students will learn how human evolutionary history has shaped our susceptibility and resistance to both chronic and infectious diseases. Prereq: ANTH 1303. Cross-listed with ANTH 4060 and 5060, PBHL 4060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5080 - Global Health Practice

A travel-study course that provides students the opportunity to work on global health issues in the context of a supervised internship experience. In addition to a formal internship placement or directed research opportunity, students attend formal lectures and participate in seminars devoted to addressing those health issues most relevant to the country in which the course is being taught. Prereq: HBSC/ANTH 5014/4010, HBSC/ANTH 5024/4020, HLTH 6070 or equivalent. Cross-listed with ANTH 4080 and 5080, PBHL 4080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5090 - Political Economy of Drugs

Psychotropic drugs, both legal and illicit, are a predominant part of our everyday lives. This course examines their use and meaning within cultures, and the social, political and economic issues that surround their production, use and misuse. Prereq: Introductory course in Cultural Anthropology. Cross-listed with ANTH 4090/5090 and PBHL 4090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5110 - Public Health Perspectives on Family Violence

Public health views family violence from a prevention perspective. Our exploration of child abuse, intimate partner violence, and other forms of family violence will complement other disciplinary approaches by focusing heavily on the community and social factors that contribute to abusive relationships. Theories of power and coercion and approaches

to researching these issues will be analyzed and discussed through our exploration of the various forms of family violence. Prereq: Graduate standing. Cross-listed with PBHL 4110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5200 - The Global HIV/AIDS Epidemic

Provides a foundation for a critical analysis of HIV/AIDS in global context, concerning topics such as disease, the body, ethnicity/race, gender, sexuality, risk, addiction, power, and culture together with a set of ethnographic texts that explore the epidemic's impact. Cross-listed with HBSC 4200 and PBHL 4200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5620 - Health Risk Communication

Acquaints students with contemporary theory, research, and practice in health risk communication. Cross-listed with COMM 5620/4620, ENVS 5620, and PBHL 4620. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 5840 - Independent Study

This course requires active independent learning based upon a written curricular outline and agreement with a faculty from Health and Behavioral Sciences who supervises the student's work throughout the semester. Prereq: Permission of instructor required. Max hours: 9 Credits. **Semester Hours:** 3 to 3

HBSC 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HBSC 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

HBSC 5995 - Travel Study

A flexible format that permits courses to be taught in various areas of the world. Prereq: Graduate standing and permission of instructor. Max hours: 12 Credits. **Semester Hours:** 3 to 9

HBSC 5999 - Topics in the Health and Behavioral Sciences

An in-depth study of selected social science perspectives/theories and their applications to population health. Topics will vary from semester to semester, with a particular emphasis on current, salient population health problems. Prereq: Graduate standing or permission of instructor. Cross-listed with PBHL 4999. Max hours: 9 Credits. **Semester Hours:** 3 to 3

HBSC 6320 - Human Genetics: Legal, Ethical and Social Issues

Examines legal, ethical, and social issues that have come about with advances in human genetics. Topics include privacy, informed consent, discrimination, forensics, medical malpractice, and property rights. Prereq: Graduate standing. Cross-listed with HBSC 7320, ANTH 6041. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 6840 - Independent Study: HBSC

Max hours: 9 Credits. **Semester Hours:** 1 to 3

HBSC 7001 - Colloquium Series in the Health and Behavioral Sciences

Features presentations by core, affiliated and adjunct faculty; alumni; distinguished guest speakers; and students nearing completion of the dissertation. The goal is to expose students to cutting-edge applications of health-related social and biological science research and to introduce students to the research interests of core and affiliated HBS faculty, advanced students, and alumni who they might otherwise not have the opportunity to meet. Note: Required for ALL first and second year students but open to all graduate students and faculty. May be taken up to three times for credit. Max hours: 3 Credits. **Semester Hours:** 1 to 1

HBSC 7011 - Theoretical Perspectives in Health and Behavioral Science I

Covers the following subject areas: philosophy and epistemology of the social and behavioral sciences as they are applied in public health and health care contexts; historical perspectives of Western biomedicine and public health; cross-cultural perspectives on health systems; class, ethnic, and gender correlates of health and sickness; critical perspectives on Western health and health care models; and the structure and organization of health care systems. Note: Part I of a required, two-semester, interdisciplinary, team-taught, seminar-format course that meets three hours a week for the academic year. Prereq: Admission to the Health and Behavioral Sciences program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7021 - Theory in Health and Behavioral Sciences

Covers theories utilized in development and assessment of public health programs with goals to improve health. Students acquire skills in theory building and testing and how to best utilize theory to address pressing health concerns. Prereq: HBSC 7011. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7031 - Human Ecology and Environmental Adaptation

Focuses on the interplay of biology, environment, culture, and behavior in the causes and exacerbation of disease. The course includes the following topics: health in environmental and evolutionary contexts; models of causation in biomedicine and other medical systems; individual, community, and population manifestations of health and disease; and biocultural interaction in disease process. Specific case studies drawn from contemporary health problems are used to illustrate in detail the nature of these processes. Prereq: Admission to the Health and Behavioral Sciences program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7041 - Research Design and Methods in the Health and Behavioral Sciences I

This course has four principal aims: (1) to provide students a working knowledge of research methodology as applied to field research efforts; (2) to enable students to apply research methodologies to areas of particular interest in the health and behavioral sciences; (3) to expose students to data manipulation techniques common to social science quantitative research; and (4) to teach basic research proposal development techniques. Prereq: Admission to the Health and Behavioral Sciences program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7051 - Qualitative Research Design and Methods

Much of the data collected in the social sciences is interview- and text-based. This course explores methods for collecting and analyzing these data and theoretical paradigms that underlie these methods. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7061 - Quantitative Methods in the Health and Behavioral Sciences

This course introduces students to multivariate regression methods - a set of statistical models that relate an outcome variable to a set of predictor variables. The course emphasizes understanding and applying regression models to address social science research questions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7071 - Social and Behavioral Determinants of Health and Disease

Surveys the distribution, determinants, and psychological and behavioral aspects of health and disease. Social, economic, environmental, and cultural variations in and determinants of health, disease, and quality of life, as well as barriers to access and utilization, geopolitical influences, environmental and social injustice, historical trends, and future directions are addressed. Prereq: HBSC 5001 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7111 - Applications of the Health and Behavioral Sciences

The purpose of this course is to help students select and refine a dissertation research topic. Each student, through presentations and discussions of their work, will receive feedback from fellow students and the instructor, and will have an opportunity to improve written and oral presentation skills. Prereq: HBSC 7041. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7120 - Human Reproductive Technologies and the Law

Examines the legal, ethical, and social issues that have come about with advances in assisted reproductive technologies (ART). Illustrates how lawyers, judges, bioethicists, legislators, and policy makers have addressed these issues. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7121 - Dissertation Proposal and Research

Max hours: 8 Credits. **Semester Hours:** 6 to 8

HBSC 7161 - Quantitative Methods in Health&Behavioral Sciences II

This course introduces students to advanced multivariate regression methods (e.g., generalized linear models, survival models, hierarchical models). This course emphasizes the application of advanced regression methods to test social and behavioral science theories related to health. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7210 - Human Health and Environmental Pollution

Examines the roles of technology and society in the etiology and control/prevention of adverse health outcomes associated with releases of toxic substances. Examples come from experience and the literature on occupational cancer and reproductive hazards, occupational and environmental regulation of hazardous wastes, air, and water pollution. Cross-listed with ENVS 6210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7235 - GIS Applications in the Health Sciences

Examines how GIS is used throughout the health care industry and public health. Covers environmental health, disease surveillance, and health services research. Students critically review current literature and gain hands-on experience with GIS software. Prereq: GEOG 4080 or GEOG 5080, public health background, or consent of instructor. Cross-listed with GEOG 4235, GEOG 5235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7310 - Environmental Epidemiology

Provides a basic understanding of the methods used to study the effects on human health of exposures to physical, chemical, or biological factors in the external environment. The course explains the use of epidemiologic methods through a problem solving approach to investigating environmental health case studies. Prereq: A basic statistics course and graduate standing or permission of instructor. Cross-listed with ENVS 6230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7320 - Human Genetics: Legal, Ethical and Social Issues

Examines legal, ethical, and social issues that have come about with advances in human genetics. Topics include privacy, informed consent, discrimination, forensics, medical malpractice, and property rights. Prereq: Graduate standing. Cross-listed with HBSC 6320, ANTH 6041. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7340 - Risk Assessment

The process of determining the likelihood and extent of harm that may result from an activity or event. Topics covered are: hazard identification, dose-response evaluation, exposure assessment, and risk characterization. The subjects of risk management, risk perception, and risk communication are also discussed. Prereq: Graduate standing or permission of instructor. Cross-listed with CVEN 5494, ENVS 6200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7360 - Toxicology

Introduces the field of toxicology. Emphasizes the mechanisms by which chemicals produce toxic effects and the methods for assessing toxicity. Note: Designed for students in the environmental sciences and occupational health fields. Prereq: One year college chemistry and one year college biology. Cross-listed with ENVS 6220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HBSC 7400 - Topics in the Health and Behavioral Sciences

A flexible seminar format for dealing with topics of special interest in the health and behavioral sciences. Topics to be considered vary from semester to semester. Prereq: Graduate standing. Max hours: 9 Credits. **Semester Hours:** 3 to 3

HBSC 8990 - Doctoral Dissertation

Prereq: Admission to the Health and Behavioral Sciences program. Max hours: 30 Credits. **Semester Hours:** 1 to 10

HDFR 1000 - Global Human Development & Learning

The purpose of this course is to examine the contextual nature of human development and learning at the global level. Emphasis is placed on the ecological development of individuals and learning and schooling within familial, cultural and educational contexts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 1010 - Life Span Development in Ecological Settings

This course is designed to introduce students to human development in ecological settings in particular family, school and community contexts as it occurs across the lifespan, including emotional, physical, and cognitive development, and emphasizes personal adjustment and achievement. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 1020 - Black and Latino Children

This course will use ecological systems theory perspectives as a foundation for understanding Black and Latino children in family systems, school systems and community systems. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 1030 - Who am I? Cultural Identity, Family, Diverse Soc Sys

This course will use ecological systems theory perspectives as a foundation for understanding diverse Latino family dynamics, the intersection between Latino families, schools and community systems and other critical issues that Latino family systems face in the United States. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 2000 - Introduction to Family and Community Services

Through ecological systems theories this course is designed to provide students with an introduction to family and community services within community and educational environments. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 2000 - Introduction to Family and Community Services

Through ecological systems theories this course is designed to provide students with an introduction to family and community services within community and educational environments. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 2110 - Child Ecology

This course focuses on the study of human growth and ecology from conception to adolescence. The emphasis is on the major theories of child growth, development, and ecology and the implications of classic and contemporary research in the community. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 2200 - Love, Family and Human Development

This course provides an introduction to understanding love, intimate relationships, and family relations through an ecological systems perspective. The course provides an exploration of contemporary diverse family systems and their relationships across the life span. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 3002 - Preparing to be a HDFR Professional

In a seminar format, students will examine the ethics, value systems, and family policies and law affecting the Human Development and Family Relations profession. Students will utilize tools of professional preparation including goal-setting, building/refining resumes, and marketing skills and abilities. Restriction: Faculty or Academic Advisor approval is required to register. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 3050 - Children's Thinking and Assessment

A review of the psychology of children's thinking emphasizing developmental changes in modes of thought. Topics include conceptual behavior, problem solving, intelligence, creativity, humor, play, and an introduction to diagnostic, formative and summative assessment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 3100 - Adolescent Ecology

Through ecological systems theories this course is designed to provide an understanding of adolescent ecological development and growth. Students will become familiar with adolescent development and growth from ecological perspectives in contexts of families, schools and communities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 3250 - Families in Global Perspectives

Students will become familiar with family life across the world. Through ecological systems theories, this course is designed to provide an understanding of families in global perspectives. The impact of family policy and practices on international families will be examined. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 3400 - Love, Couples and Family

This course examines the development and maintenance of couple and family relationships through family therapy based concepts, family systems theories and other family theories. Topics include communication patterns, stress and conflict management, decision making and goal-setting within the family. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 3500 - Introduction to Higher Education

The course examines the history and structure of the institutions higher education in U.S. This course will also examine the relationship between institutions of higher education, students, faculty, administrators, and society at large. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4000 - Human Sexuality

Students will become familiar with human sexuality across the life span. Ecological and family systems theories will provide an understanding of human sexuality from a systemic perspective. Implications for working with individuals, families, and couples will be examined. Cross-listed with COUN 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4001 - Families and Parenting

This course provides an advanced overview of theories and practices that impact culturally and linguistically diverse families and the parenting process through family systems and ecological perspectives. Specifically, there is a focus on the parent-child relationship through adolescence. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4002 - Family Life and Community Programming I

This course teaches the principles, philosophies, models, and strategic methods of family life education for strengthening interpersonal and family relationships. Culturally competent students will learn about the development and implementation of effective educational programs and experiences within different community settings. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4003 - Leadership and Organizations

This course provides an understanding of leadership theory and practice in community and educational environments. Students will learn about important aspects about leading diverse community and educational organizations including staff supervision, strategic planning, advancing the organization and maintaining integrity. Cross-listed with HDFR 5003. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4004 - Family and Comm. Prog. II Grant Writing/Fundraising

This course provides an understanding of developing skills on grant writing and fundraising as related to family, community and educational organizations/agencies. Students will learn about important aspects about grant writing, fundraising fundamentals and funding models for sustainability. Cross-listed with HDFR 5004. Max hours: 3 Credits.

Semester Hours: 3 to 3

HDFR 4010 - Family and Cultural Diversity

The examination of familial, gender, cultural, linguistic, social and other ecological factors on diverse family systems in the United States will be covered. An ecological theoretical analysis of minority family systems within a familial, educational and social justice perspective will be explored. Cross-listed with HDFR 5010. Max hours: 3 Credits.

Semester Hours: 3 to 3

HDFR 4040 - Latino Families in School and Communities

This course will use ecological systems theory perspectives as a foundation for understanding diverse Latino family dynamics, the intersection between Latino families, schools and community systems and other critical issues that Latino family systems face in the United States. Cross-listed with HDFR 5040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4045 - Abuelos (Grandparents) Latino Families

The course will focus on the social gerontology of Latinos families in later life. Specifically, the course will examine how ecological factors including familial, cultural, social, economic, health, cognitive and educational, impact the lives of Latino older person's in the contexts of family systems. Cross-listed with HDFR 5045. Max hours: 3 Credits.

Semester Hours: 3 to 3

HDFR 4050 - Foundations of Student Affairs

This course examines theories of college student development including student learning and growth during the postsecondary years. This course will provide an introduction to psychosocial, cognitive, moral, and social identity development theories used to explain college student development. Cross-listed with COUN 5050. Max hours: 6 Credits. **Semester Hours:** 3 to 3

HDFR 4075 - Family Policy & Law

In this course students will identify, develop, implement and evaluate social policies and laws that effect the well-being of families. Through a family systems perspective, students will examine the law, social services, education, the economy, religion, and politics impact families. Cross-listed with HDFR 5075. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4080 - Global Family Resource Management

This course examines the allocation of family resources (social, financial and material assets), the influence of various ecological systems, the effect on family functioning and goal-setting from a global perspective. Practical applications for Family Relations professionals are included. Cross-listed with HDFR 5080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4090 - Helping Profession Skills in HDFS

This course is designed to provide an overview of essential skills required in a variety of helping situations and settings. Course content includes the development of accurate listening, empathy, reflection, and inquiry skills. Implications for working with individuals, families, and couples will be examined. Cross-listed with HDFS 5090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4110 - Human Learning

A review of the research on human learning, including related topics such as information processing and motivation. Various theories of learning are examined in-depth, and their applications to teaching and practices in schools (and in other educational settings) are considered. Cross listed with EDHD 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFS 4130 - College Student Development

This course examines theories of college student development including student learning and growth during the postsecondary years. This course will provide an introduction to psychosocial, cognitive, moral, and social identity development theories used to explain college student development. Cross-listed with COUN 5130. Max hours: 6 Credits. **Semester Hours:** 3 to 3

HDFS 4200 - Adult Ecology

The emphasis is on the major theories of adult ecology and growth and the implications of classic and contemporary research in the community. Specifically, biological, psychological, psychosocial, cognitive, and cross-cultural theories will be explored. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFS 4240 - Cognition and Instruction

Explores recent developments in cognition and their implications for instructional practices. Includes theory and research in cognitive psychology and resultant educational practices. Cross listed with EDHD 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFS 4260 - Family Systems and Social Justice

Relying on ecological systems theories, this course will introduce students to families and family systems. Students will investigate how families experience (in)justice in the areas of access to education, community services, and employment. Cross-listed with HDFS 5260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4500 - Diversity, Inclusion, Social Justice in Higher Education

An examination of society, media, and public and educational policy and their impact on higher education access and persistence for marginalized groups. Students are called to consider how student affairs professionals might promote social justice for marginalized student groups. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 4910 - Practicum

This course provides supervised field experience to Human Development and Family Relations students. Students will apply theory and evidence-based knowledge in professional situations, enhancing the development of their professional identities and career goals by working within and evaluating community-based organizations. Prereq: HDFR 3002. Max hours: 5 Credits. **Semester Hours:** 1 to 5

HDFR 5003 - Leadership and Organizations

This course provides an understanding of leadership theory and practice in community and educational environments. Students will learn about important aspects about leading diverse community and educational organizations including staff supervision, strategic planning, advancing the organization and maintaining integrity. Cross-listed with HDFR 4003. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 5004 - Family and Comm. Prog. II Grant Writing/Fundraising

This course provides an understanding of developing skills on grant writing and fundraising as related to family, community and educational organizations/agencies. Students will learn about important aspects about grant writing, fundraising fundamentals and funding models for sustainability. Cross-listed with HDFR 4004. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 5010 - Family and Cultural Diversity

The examination of familial, gender, cultural, linguistic, social and other ecological factors on diverse family systems in the United States will be covered. An ecological theoretical analysis of minority family systems within a familial, educational and social justice perspective will be explored. Cross-listed with HDFR 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 5040 - Latino Families in School and Communities

This course will use ecological systems theory perspectives as a foundation for understanding diverse Latino family dynamics, the intersection between Latino families, schools and community systems and other critical issues that Latino family systems face in the United States. Cross listed with HDFR 4040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 5045 - Abuelos (Grandparents) Latino Families

The course will focus on the social gerontology of Latinos families in later life. Specifically, the course will examine how ecological factors including familial, cultural, social, economic, health, cognitive and educational, impact the lives of Latino older person's in the contexts of family systems. Cross-listed with HDFR 4045. Max hours: 3 Credits.

Semester Hours: 3 to 3

HDFR 5075 - Family Policy & Law

In this course students will identify, develop, implement and evaluate social policies and laws that effect the wellbeing of families. Through a family systems perspective, students will examine the law, social services, education, the economy, religion, and politics impact families. Cross-listed with HDFR 4075. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 5080 - Global Family Resource Management

This course examines the allocation of family resources (social, financial and material assets), the influence of various ecological systems, the effect on family functioning and goal-setting from a global perspective. Practical applications for Family Relations professionals are included. Cross-listed with HDFR 4080. Max hours: 3 Credits. **Semester**

Hours: 3 to 3

HDFR 5090 - Helping Profession Skills in HDFR

This course is designed to provide an overview of essential skills required in a variety of helping situations and settings. Course content includes the development of accurate listening, empathy, reflection, and inquiry skills. Implications for working with individuals, families, and couples will be examined. Prereq: COUN 5010. Cross-listed with HDFR 4090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 5260 - Family Systems Social Justice

Relying on ecological systems theories, this course will introduce students to families and family systems. Students will investigate how families experience (in)justice in the areas of access to education, community services, and employment. Cross-listed with HDFR 4260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 6000 - Family Theories

Students will examine the methods of inquiry and the basic foundations of contemporary family theory. Using a family systems perspective, students will utilize and analyze theory in the exploration of diverse and changing family dynamics in a societal context. Cross-listed with HDFR 7000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 6120 - Family Dynamics

Review and analysis of issues related to families with exceptional or at-risk young children. Topics include coping skills, family involvement, parent-child interaction, and sources of support. Special attention is given to current research and its application to early intervention. Cross-listed with EDHD 7120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HDFR 7000 - Family Theories

Students will examine the methods of inquiry and the basic foundations of contemporary family theory. Using a family systems perspective, students will utilize and analyze theory in the exploration of diverse and changing family dynamics in a societal context. Cross-listed with HDFR 6000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6010 - Preservation Theory and Practice

The practice of historic preservation has evolved in a specific policy context. This introductory course introduces basic American institutions and laws associated with preservation as well as standards, definitions, and practices associated with these. Cross-listed with URPL 6499. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6090 - Special Topics in Historic Preservation

Various topics in historic preservation, according to current faculty and student interests. Prereq: HIPR 6010 or permission of instructor. Max hours: 12 Credits. **Semester Hours:** 3 to 3

HIPR 6110 - Regionalisms & the Vernacular

This class explores the history of the built environment from the perspective of evolutionary change; peoples attempting to meet utilitarian needs, respond to environmental forces, societal expectations, and aesthetic aspirations through design. The course looks closely at vernacular structures in a global context. Prereq: HIPR 6010 or permission of instructor. Cross-listed with ARCH 6350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6170 - Preservation Design Studio

Preservation Design Studio provides a project-based learning experience for Historic Preservation students; who are typically integrated into a pre-approved studio of one of the College of Architecture & Planning's departments. Topics vary according to faculty interests. Cross-listed: Varies by semester. Max hours: 12 Credits. **Semester Hours:** 6 to 6

HIPR 6210 - Historic Buildings in Context

This course covers the concept of "historic significance" and develops skills in understanding and professionally utilizing this concept. Procedures and skills are introduced. Prereq: HIPR 6010 or permission of instructor. Cross-listed with ARCH 6233. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6310 - Documentation, Analysis, Representation

This methods course focuses on skills development in in-situ documentation of the historic environment. The course includes modules on: a) historic records, b) archaeological evidence, c) building and site measurement, d) photographic & photometric methods, e) geo-spatial data, f) graphic representation, and g) reporting formats. Prereq: HIPR 6010 or permission of instructor. Cross-listed with ARCH 6352. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6410 - Urban Conservation: Context for Reuse

This course begins with the premise that human habitats, and especially cities, are dynamic and ever changing; and that the preservationist cannot (and should not try) to freeze cities in a static representation of the past. The course deals with both the philosophical and political contexts, but emphasizes the role of strategic design intervention in the shaping of evolving cities. This includes traditional preservation activities, but also recognizes the importance of progressive change. Readings are diverse, but at least two case study cities are used to ground the concepts. Class activities include: a) research, b) field study, c) design, and d) presentation. Prereq: HIPR 6010 is recommended. Cross-listed with ARCH 6355. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6510 - Building Conservation

This course emphasizes the relationship between knowledge acquisition, professional judgement, and design modification. Topics include: 1) Historic Building Types & Methods, 2) Field and Lab Methods of Building Assessment, and 3) Management of Building Rehabilitation. The course takes an integrative approach to the scientific, aesthetic, managerial and legal dimensions of preservation. Prereq: HIPR 6010 or permission of instructor. Cross-listed with ARCH 6351. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6610 - Reading the City

Design and planning professionals, including preservationists, must learn to work in environments with which they have had little previous knowledge. This course emphasizes gaining understanding of a novel environment and translating that knowledge into a well researched and media savvy professional presentation. Students prepare a research plan, then conduct research on a relatively unfamiliar urban environment, such as Chicago (or other major city), returning to prepare, present, and critically reflect upon their applied research through a media-savvy final project. Prereq: HIPR 6410 is recommended. Cross-listed with ARCH 6232. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6840 - Independent Study

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to historic preservation. Prereq: Permission of instructor. Max hours: 3 Credits. **Semester Hours:** 1 to 3

HIPR 6851 - Professional Project

The Professional Project is one of two options for completing the Capstone Requirement. There are multiple ways of satisfying this requirement, but the agreed upon Project must show critically reviewed evidence of professional competence in the field of historic preservation. Prereq: Permission of instructor. Max hours: 3 Credits. **Semester Hours:** 1 to 3

HIPR 6930 - Internship

Designed to provide professional practice experience. The internship is composed of eight to twelve hours per week working in a professional preservation setting during the regular semester. Prereq: Permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIPR 6951 - Thesis

Thesis is one of two options for completing the Capstone Requirement. Students may choose to develop a specialized thesis in some topic related to historic preservation. Prereq: LDAR 6949. Max hours: 6 Credits. **Semester Hours:** 6 to 6

HIST 1016 - World History to 1500

Surveys the rise of civilizations and their interactions from prehistoric to modern times. The emphasis is on the understanding of the various styles or characteristics of civilizations within a global context. Max hours: 3 Credits.

Semester Hours: 3 to 3

HIST 1026 - World History Since 1500

Surveys the interactions of the world's civilizations in modern times. The emphasis is on understanding the concept of modernization within a global context. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

HIST 1211 - Western Civilization I

Introduces ancient Mediterranean civilization and the birth of Europe. Covers topics on economics and society, political organization, intellectual history, and art from 3000 B.C. to A.D. 1500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 1212 - Western Civilization II

Introduces modern European civilization and its spread over the world. Covers topics on economics and society, political organization, intellectual history, and art from A.D. 1500 to the 20th century. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 1361 - U.S. History to 1876

Provides an introduction to the major forces, events and individuals that shaped the historical development of American society, beginning with the European settlement of America and concluding with the Civil War, reconstruction and the early growth of an industrial order. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-HI1. **Semester Hours:** 3 to 3

HIST 1362 - U.S. History Since 1876

Provides an introduction to the major forces, events, and individuals that shaped the historical development of American society from the Civil War to the present. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-HI1. **Semester Hours:** 3 to 3

HIST 1381 - Paths to Present

Examines several topics of profound interest to historians world wide: nature and technology, secular and religious faiths, and concepts of political union. The experience of the U.S. as it relates to the experiences of other periods and cultures. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-HI1. **Semester Hours:** 3 to 3

HIST 1400 - Controversies in History

Examines a variety of cases where historians have significant disagreement or diverse interpretations regarding "what happened" and "why," to come to an understanding of what historians do and how they do it. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

HIST 3031 - Theory and Practice of History: An Introduction to the Major

Introduces history majors to the discipline at the outset of their course work. Covers historiographical trends and methodologies, and familiarizes students with the various types of research and writing they are likely to encounter in their classes. Note: This course should be taken as early as possible, and must be taken before HIST 4839. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3121 - The World at War, 1914-1945

Examines World Wars I and II as episodes in a protracted conflict among the nations of the capitalist West, the emerging states of Asia and the colonial world, and the USSR. Studies the causes and consequences of the wars. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3230 - The American Presidency

Explores the presidency in U.S. History. Topics include: ideological and constitutional foundations; expansion of presidential power in domestic politics and international relations; evolution of presidential campaigns; and dimensions of presidential leadership in politics, society and culture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3231 - Famous U.S. Trials

This introduction to the history of the U.S. trial court system will contextualize significant trials in historic and cultural moments. The course will explore the roles of legal communication and mass communication in contemporary and subsequent representations of the trial. Cross-list COMM 3231. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3232 - The American Colonies to 1750

The maturation of the American colonies within the British Empire, the development of commercial and intellectual centers, the creation of uniquely American politics, and the unfolding of critical differences between North and South. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3235 - U.S. Labor History, 1800 to the Present

Explores the experiences, contributions, and struggles of working-class Americans from the Civil War to the present. Areas of focus include pre-industrial and post-industrial labor, slavery, agricultural labor, gender and working class culture outside of the work place. Particular attention is paid to immigration, ethnicity, race and gender, as they relate to the history of America's laboring class. Prereq: Upper division standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3297 - Social History of Asian Americans

This introductory-level course surveys the social history of Asian American groups from the mid-19th century to the present. We will examine immigration patterns, the development of communities, social and economic problems, and anti-Asian movements and activities. Cross-listed with SOCY 3297 and ETST 3297. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3343 - Women in U.S. History

An analysis of women's place in society, in the work place, and in the political arena over the last 300 years. Cross-listed with WGST 3343. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3345 - Immigration and Ethnicity in American History

Explores the personal and collective experience of immigrants to America. Discusses problems of assimilation, urban and rural experiences, and implications for politics, the economy and social attitudes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3347 - African-American History, 1619-Present

Explores the African-American experience, including definitions of citizenship, strategies for protest and resistance, models of leadership, religious life and cultural expression, divisions of class, color and gender. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3348 - The African-American Protest Tradition, 1865 - Present

Examines a series of influential African-American activists and considers such themes as intra-racial divisions, Pan-Africanism, black nationalism, the use of the courts and legal efforts, and black conservatism. Max hours: 3 Credits.

Semester Hours: 3 to 3

HIST 3349 - Social Movements in 20th Century America

By surveying the major American social movements of the twentieth century, this course will explore how Americans have created categories of race, ethnicity, culture, and sexuality and how elite and marginalized citizens have deployed these categories in politics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3350 - Colonial Latin America

Surveys the creation of colonial empires by Spain and Portugal, 1492-1808. Topics include Native American responses to European incursions, women in colonial society, and slavery in Latin America. Cross-listed with ETST 3350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3360 - Denver History

Introduces the social, political, economic, and cultural life of this mile high metropolis. Founded in the 1858 gold rush, Denver has grown into a five-county metropolis of over two million. Explore this boom and bust history in lectures, slide shows and walking tours. This course offers students a chance to do their own primary source research project, as well as exams and book reports. Note: Open to all students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3364 - Native Americans and Spaniards in North America

Examines the interactions between Native Americans and Spanish invaders beginning in the 16th century. The course explores the impact of colonialism in what is today the American Southwest. Focuses on Native American adaptation and resistance to the European presence. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3365 - Aztlan in the United States: Chicano History from 1821

Explores the impact of U.S. rule on the Southwest, paying particular attention to legal, economic, and social changes that created new political and cultural identities in the Southwest. Cross-listed with ETST 3365. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3366 - Environmental History of North America

Examines the conversation that the peoples of North America have had with the earth, from Indian prehistory to modern industrial civilization. Out of the people-land dialogue has emerged a variety of cultures, some of which, as we shall see, successfully adapted to their environment, while others failed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3396 - History of the American Indian

Indigenous nations in North America comprise hundreds of diverse cultures. This course examines U.S. Indian policy and how indigenous nations responded; how they creatively adapted, and resisted cultural change; and how they continue to persist culturally, socially, and politically. Cross-listed with ETST 3396. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3451 - Introduction to African History

By looking at specific examples of the cultural, political, and economic experience of African society, this course attempts to introduce and make comprehensive the diverse history of the people of Africa. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3460 - Modern Latin American History

Surveys the historical development of the modern Latin American countries, beginning with the independence movements of the early 19th century. Emphasizes the 20th century issues and problems that have characterized these countries and affected their relations with the United States. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3469 - Intro to East Asia: To 1800

This course introduces the history of China, Japan and Korea to 1800 focusing on political, economic and social changes. It is designed for lower division undergraduates with no background in Asian history. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3470 - Intro to East Asia: Since 1800

This course introduces the history of China, Japan and Korea from 1800 to the present, focusing on political, economic and social changes. It is designed for lower division undergraduates with no background in Asian history. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3471 - Islam and Asia

The course traces patterns of identity construction and compares social, political and cultural practices across regions and through Asia's diverse states and empires. Taking a broad survey of historical processes led by Asian Muslims, the course asks: why did some regions of Asia convert to Islam in large measure and others not? Why has the nineteenth century been called ""Islam's Indian century?"" ""What is the difference..."" between creating a Muslim homeland like Pakistan and an Islamic state like Iran? Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3480 - Introduction to European History

Students are introduced to the major themes of European history and culture from the Enlightenment to the present. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3481 - Ancient Greece

A history of the Greek-speaking world, from the Bronze Age depicted in Homer's epics to Alexander the Great and the Hellenistic Kingdoms. The course addresses the political, intellectual, socioeconomic, and military history of the eastern Mediterranean, with an emphasis on Greece. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3482 - Rome: City and Empire

Pagan Rome from its earliest beginnings to the rise of Christianity. Emphasis is on the military, socio-economic, and political history of Rome, its empire in Italy, and its domination of the Mediterranean World (ca. 800 B.C. to A.D. 300). Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3483 - Gandhi's India and Modern South Asia

Surveys the social, economic, and political processes that shaped modern South Asia. Considers issues in contemporary political debates within their original historical contexts and trace the power of relationships that affected changes, long-term continuities, and revivals. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3484 - British Isles to 1714

A sampler of the rich, diverse, and dramatic history of the peoples of the British Isles. State formation, economic and social change and cultural values are several of the themes threaded through this survey course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3485 - British Isles Since 1714

This course examines the dramatic rise of the British industrial, commercial, and political empire during the 18th and 19th centuries and its equally dramatic decline in the 20th century. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3486 - Renaissance and Reformation

Explores the late 13th through middle 17th centuries when European art and culture changed dramatically, and when Europe was torn by explosive ideological conflicts and religious upheaval. Cross-listed with RLST 3486. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3487 - Medieval Europe

Surveys the general history of Europe from the fall of Rome to the opening of modern Europe. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3488 - Tudor-Stuart England

England's rise from obscurity in 1487 to the dawn of her age of European and world dominance in the early 18th century. Family life and popular culture as well as Henry VIII, Queen Elizabeth, Parliament, and Cromwell. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3500 - African History in Novels and Films

Introduces modern Africa through the eyes of creative artists. Various topics, such as childhood, religion, and colonialism, are presented from various points of view--African and non-African. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3601 - Colorado History

Presents the story of the people, society, and culture of Colorado from the earliest Native Americans, through the Spanish influx, the fur traders and mountain men, the gold rush, railroad builders, the cattlemen and farmers, the silver boom, the tourists, and the modern twentieth-century state. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3606 - Science, Technology, and Society in the Modern World

Examines the relationships among science, technology, and society from the early 19th century to the present. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3706 - Age of Revolution

Examines revolutions in selected societies around the world during the period from 1750 to 1950. The specific revolutions chosen may vary, but representative upheavals in both the Western and non-Western worlds are examined. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 3810 - Topics

Topics in history with varying subtitles reflecting course content. Max hours: 9 Credits. **Semester Hours:** 3 to 3

HIST 3840 - Independent Study: History

Max hours: 6 Credits. **Semester Hours:** 1 to 3

HIST 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

HIST 3995 - Travel Study

Created for students doing travel study in a foreign country; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

HIST 4027 - Enlightenment and Revolution

In this course students explore the relationship of ideas and events in Europe during the 17th and 18th centuries. Modernizing trends in the European economy, religion, science, states and international affairs leading up to the French Revolution. Cross-listed with HIST 5027. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4028 - Nations and Classes: 19th Century Europe

Focuses on material and ideological changes in 19th century Europe, exploring social, cultural, political, economic, and intellectual developments. Cross-listed with HIST 5028. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4029 - Age of Anxiety in Europe

Looks at Europe at the end of the nineteenth century in an effort to determine if there is any relation between the peculiarities in culture at the time and the horrors in politics that followed. Cross-listed with HIST 5029. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4030 - Europe During the World Wars

Covers the history of the two world wars and their origins, political and social upheaval during the interwar economic crisis, the rise of communism, Italian fascism and Nazism, with an emphasis on cultural production and intellectual life. Cross-listed with HIST 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4031 - Contemporary Europe

History of Europe since 1945. Students study the economic, social, and political history of Europe since World War II, with a special emphasis on the Cold War and intellectual currents. Cross-listed with HIST 5031. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4032 - Globalization in World History Since 1945

An interdisciplinary course on contemporary world history and globalization. While the course is historically structured, economic, political, and sociological matters are explored. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with HIST 5032. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4034 - Core Themes in European History

Core themes in modern Europe, 1750 to the present. Cross-listed with HIST 5034. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4035 - Crisis and Transformation: Europe's 20th Century

This course examines 20th century European history focusing on themes of crisis and transformation. We will explore how devastating wars, economic depression, stark ideological divisions, and revolutionary social, political and cultural movements dramatically changed Europe over the course of the century. Cross-listed with HIST 5035. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4046 - Victorians and Victorianism

Taking an interdisciplinary perspective, this course examines English people and English life during the reign of Queen Victoria, 1837-1901. What were the defining features of the Victorian age? What did it mean to be "Victorian?" When and why did the Victorian paradigm break down? Cross-listed with HIST 5046. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4051 - Britain and The Empire

Examines 19th and 20th century British history, addressing social, cultural, and political themes. Explores industrialization, state growth, and imperialism; relationships between race, gender, and class; and the ways in which colonizers and the colonized experienced empire. Cross-listed with HIST 5051. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4055 - The Atlantic Slave Trade: Africa, Caribbean and U.S.

Presents a broad overview of the slave trade in the Atlantic World, including discussion of the slave plantation, the creation of Caribbean societies and the consequences of independence from Britain. Cross-listed with HIST 5055. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4062 - Modern France, 1789 to the Present

Considers the shaping of modern France from the 18th century Bourbon Monarchy and aristocratic society to today's liberal democracy, in which multiculturalism, globalization and supranational institutions call into question the very nature of French identity. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with HIST 5062. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4071 - Modern Germany

Surveys the major political, institutional, social, economic, and cultural developments that have occurred in Germany since the late 18th century. Cross-listed with HIST 5071. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4074 - Post-War Germany

Historical survey of Germany since the second world war, with an emphasis on culture and society. Cross-listed with HIST 5074. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4075 - Travel Stories and Origins of Cultural Anthropology

Examines the early history of cultural anthropology by means of classic travel literature. Cross-listed with HIST 5075. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4076 - History of Modern Science

Surveys the history of science from the 18th century to the present. Treats all disciplines, from physics to physiology, in an attempt to understand how the natural world came to dominate our sense of ourselves. Cross-listed with HIST 5076. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4082 - Reform and Revolution in Russia: The 1860s to 1917

Emphasis upon Russia's attempts to modernize, beginning with great reforms of the 1860s and 1870s; increasing polarization of government and opposition groups. Examines governmental point of view through several monographs and revolutionary theory, including those of Marx, Engels, Lenin and Trotsky. Cross-listed with HIST 5082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4083 - Russia Since 1917

Studies the development of the Soviet Union from its formation in the October Revolution, through the Civil War, the new economic policy, industrialization, collectivism, the Stalinist purges, up to the present. Cross-listed with HIST 5083. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4086 - Eastern Europe

Studies the countries of Eastern Europe from their origins in the Middle Ages to the present. Cross-listed with HIST 5086. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4133 - Management of Material Culture and Museum Collections

This course provides in-depth knowledge of the rudiments of material culture documentation, preservation and management. While we have designed this class for those interested in working in history museums, this is also appropriate for those students who want to learn the place of artifacts in studying history. Cross-listed with HIST 5133. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4201 - Core Themes in U.S. History

This course surveys major themes in U.S. history. Cross-listed with HIST 5201. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4210 - The American Revolution

The crisis of the British Empire in North America from the end of the French and Indian War to the ratification of the American Constitution. Topics include the emerging economy, constitutional arguments against Britain, the conduct of the war, and the definition of a republic. Cross-listed with HIST 5210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4212 - Civil War and Reconstruction

Begins with the causes and outbreak of the American Civil War, describes the military conflict and the social aspects of the war, examines the federal efforts to reconstruct the southern states, and protect the rights of Black citizens after 1865. Cross-listed with HIST 5212. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4213 - The Gilded Age and Early 20th Century Challenges: U.S. History, 1865-1932

Topical study of major events in America, including Reconstruction; the rise of industry and the workers' response; westward expansion and the plight of Native Americans; urbanization and immigration; agrarian upheaval; Progressivism; World War I; the challenges of the 1920s and the onset of the Great Depression. Cross-listed with HIST 5213. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4216 - History of American Popular Culture

Explores the evolution of film, radio, television, and popular music from the 1940s to the 1980s. The course uses these and other forms of popular art to examine American history in this era. The course focuses on the shifting trends in popular culture, how that culture reflects the larger themes in American history, and how these media have impacted the national experience. Cross-listed with HIST 5216. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4217 - Consumer Culture

This interdisciplinary course examines the dynamics of the consumer culture in the context of social, economic, and technological history. The analysis begins with 17th century European origins, and continues through recent world developments, emphasizing the U.S. since 1800. Note: Open to all students. Cross-listed with HIST 5217. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4219 - Depression, Affluence and Anxiety: U.S. History, 1929 to the Present

Examines major developments, focusing on the causes of the Depression and efforts to combat it; World War II and postwar readjustments; the Cold War and challenges of world leadership; unparalleled prosperity; Civil Rights movement; the Vietnam War; and economic uncertainties amidst general prosperity. Cross-listed with HIST 5219. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4220 - U.S. Foreign Policy Since 1912

The main thrust is the emergence of the U.S. from isolation toward full-scale participation in the affairs of Europe and other areas. Special attention is given to U.S. intervention in two world wars, the Cold War, and the over extension of U.S. commitments since 1960. Cross-listed with HIST 5220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4222 - U.S. Society and Thought to 1860

Major topics include the evolution of Protestantism from Puritans to Transcendentalists; humanitarian reforms such as abolition, temperance, and women's rights; European influences on American thought; the effect of industrialization on the development of class society; and American nostalgia for agrarian life. Cross-listed with HIST 5222. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4223 - U.S. Society and Thought Since 1860

Topical survey of the main currents of American thought and their impact upon society. Topics include American philosophy, literature (extensively), art, music, immigration and urbanization, technology, extremism of both left and right, and education. Cross-listed with HIST 5223. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4225 - Urban America: Colonial Times to the Present

Rise of the American city from colonial times to present. Major emphasis on the process of urbanization since 1840: town promotion, the industrial city, immigration, boss politics and reform, urban technology, transportation systems, minorities, city planning, and the future of urban America. Cross-listed with HIST 5225. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4226 - U.S. Business History

Surveys the major changes in business practices from colonial times to the present. Primary emphasis is placed on the Industrial Revolution and after. Topics include the emergence of major personalities in the Industrial Revolution; the rise of giant corporations; the response of industrial labor unions; government intervention and regulations and the emergence of the post-industrial society. Cross-listed with HIST 5226. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4227 - American West

Introduces the diverse peoples, places, and approaches to the development of the trans-Missouri West from prehistoric times to the present. Cross-listed with HIST 5227. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4228 - Western Art and Architecture

Introduces art and architecture of the American West, emphasizing their historical context. Students are required to do book reports and a research paper. Course includes walking tours and museum visits. Cross-listed with HIST 5228. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4229 - Colorado Historic Places

Introduces community architecture, folklore, and history for all students. Students learn how to survey, describe, and designate significant historical structures and districts. Cross-listed with HIST 5229. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4230 - Women in the West

Focuses on ways in which women, from the mid-19th century through the mid-20th century, of different races, classes, and ethnic background, have interacted and been active participants in the development of the Western states. Cross-listed with HIST 5230 and WGST 4230/5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4231 - History in Museums

This core course for the museum studies area of public history introduces students to the theory and practice of museum operations. It covers the basics of museum administration, museum collection and preservation, and museum interpretation from both theoretical and practical points of view. Cross-listed with HIST 5231. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4232 - Historic Preservation

Introduces the history, methodology, and goals of historic preservation. Guest speakers, field trips, research projects, and book reports. Cross-listed with HIST 5232. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4234 - Introduction to Public History

An overview of history outside the academic setting. Students have the opportunity to learn about jobs through on-site visits and presentations made by people engaged in a wide variety of occupations in history other than teaching. Cross-listed with HIST 5234. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4235 - Sports and American Society

Examines American society and culture through the history of recreational and professional sport. Issues include class, race, gender, religion, business and politics. Cross-listed with HIST 5235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4236 - Colorado Mining and Railroads

Focuses on the transportation network that shaped the inland West, and its key role in the extractive industry that gave Colorado its start and nourished the highest state through adolescence. Cross-listed with HIST 5236. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4238 - U.S. History Through Fiction

Explores American history through novels, based on the idea that fiction offers a superb "window" through which to view the past, especially to understand the texture of American society. Prereq: Upper division standing. Cross-listed with HIST 5238. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4240 - National Parks History

Introduces how the National Park Service uses history to identify, designate, preserve, and interpret America's most outstanding historic and natural history sites. After tours of NPS sites, students select from a wide range of projects. Note: Open to all students. Cross-listed with HIST 5240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4242 - Oral History

Trains public history students in the collection of oral history interviews. Students master core readings on the theory, practice, and ethics of oral history. Cross-listed with HIST 5242. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4243 - Public History Administration

Introduces students to the skills, practice, and ethics of public history administration. Cross-listed with HIST 5243. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4244 - Interpretation of History in Museums: Exhibits and Education

This course allows students to gain in-depth knowledge of historical interpretation through exhibits and education in a museum setting. This class is designed for those preparing to work in history museums but is also appropriate for teachers and others who want to learn how museum programs interpret history with artifacts and other historical materials. Cross-listed with HIST 5244. **Semester Hours:** 3 to 3

HIST 4245 - Heritage Tourism

History and historic sites have become big business in 21st century tourism. The heritage tourism industry is explored in this introductory course for all interested students focusing on how academic history and historians can partner with tourism and recreation interests. Cross-listed with HIST 5245. **Semester Hours:** 3 to 3

HIST 4303 - Sex and Gender in Modern Britain

Examines modern British history by focusing on sex and gender as central aspects in people's lives. Considers the ways gender shapes the realms of politics, economics, society and culture in Britain from the 18th century to the present. Cross-listed with HIST 5303 and WGST 4303/5303. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4306 - Survey of Feminist Thought

Examines changes and continuities in feminist thought from the 18th century to the present, using historical and literary

materials. Explores the ways that women's characteristics, experiences, and capabilities have been understood and challenged. Cross-listed with ENGL 4306, 5306, HIST 5306, WGST 4306, 5306. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4307 - History of Sexuality

Explores the relationships between gender and norms, sexual practice, and ideas about sexuality in Europe and the United States. Examines how sex and sexuality have changed over time and how those changes relate to social, cultural, political and economic history. Cross-listed with HIST 5307 and WGST 4307/5307. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4308 - Crime, Policing, and Justice in American History

Focuses on changing legal and cultural definitions of crime, the role of the police, the evolution of punishment in theory and practice, and the role of mass culture in shaping the social history of crime and justice. Cross-listed with HIST 5308. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4345 - Gender, Science, and Medicine: 1600 to the Present

Examines the ways science and medicine have both shaped and been shaped by ideas about gender. Pays particular attention to the relationship between scientific/medical ideas about the sexes and the social organization of gender. Cross-listed with HIST 5345 and WGST 4345/5345. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4346 - Medicine and Society: the Ancients to the Present

Surveys change and continuity in definitions of health and illness, interactions between patients and practitioners, the practice of medical authority, and the relationships between science, clinical medicine, and the provision of health care. Cross-listed with HIST 5346. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4347 - History of Biology

Examines the development of modern biology from the mid-18th century to the present. Students will look at intellectual, methodological, institutional and social contexts in an attempt to answer the question of how biology became the "pre-eminent" science. Cross-listed with HIST 5347. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4348 - Mind and Malady: A History of Mental Illness

Examines the history of mental illness from the mid-18th century to the present, focusing on the institutionalization of the mentally ill, the origin of psychiatry, the development of models of mental illness and the evolution of clinical treatment. Cross-listed with HIST 5348. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4411 - Modern Mexico

Designed to familiarize students with the critical issues in Mexican political, economic and social history. Traces the emergence of independence and the difficult consolidation of an independent nation state. Cross-listed with HIST 5411, ETST 4411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4412 - Mexico and the United States: People and Politics on the Border

Examines the convoluted relations between these two republics, focusing on diplomatic, cultural, and social interactions. Cross-listed with HIST 5412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4414 - Nationalism and State Building in Latin America, 1750-1850

Explores the problems of nationalism and post-colonial state building by examining the late colonial and early national periods of Latin American history. The course discusses the impact of the enlightenment, the events of the Wars of Independence, and the quandaries faced by the new nations. Cross-listed with HIST 5414. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4415 - Social Revolutions in Latin America

A theoretical framework and an empirical basis for understanding the large-scale social movements that have influenced the course of Latin American nations. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with HIST 5415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4416 - The Age of Imperialism

Examines causes, character, and consequences of imperialism in the industrial era (ca. 1840-1975). Through intense study of selected cases, students gain an understanding of the different dynamics and varieties of imperialist control. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4417 - Commodities and Globalization: Dessert in World History

Traces the impact of "dessert commodities" (sugar, cacao, vanilla and coffee) on Latin America during an early period of globalization (nineteenth century). Explores cultural shifts in North Atlantic countries that created the incessant demand for dessert. Prereq: Senior or graduate student standing. Cross-listed with HIST 5417. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4418 - Trade and Premodern World History

Explores the interconnections that shaped premodern world history, considering the ways that the production, exchange, and consumption of cloth were tied to specific forms of political power, social and religious organization, and long distance economic relationships. Cross-listed with HIST 5418. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4420 - Traditional China: China to 1600

A general introduction to the history of China from the advent of historic civilization to the point of the great encounter with the West. Cross-listed with HIST 5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4421 - Modern China

Surveys Chinese history in the modern era. Includes examination of Western domination of China; revolution and internal fragmentation of China; Japanese attacks and World War II; and civil war and the communist revolution. Cross-listed with HIST 5421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4422 - Lvng thr Mao's China: Life, Mat. Cult, Movies, 1949-76

Introduces students to ordinary people's daily life in Mao's China (1949-1976) through an exploration of material culture, movies and scholarship. This course pays particular attention to the ways people's everyday living intertwined with politics. Cross-listed with HIST 5422. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4431 - Modern Japan

Course of Japanese history since the Perry expedition. Covers Japanese Westernization and industrialization, the expansion of empire and defeat in World War II, the occupation, and the amazing technological and social transformation since the occupation years. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with HIST 5431. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4451 - Southern Africa

An in-depth history of the clash of peoples and cultures in Africa south of the Zambezi River. African and Afrikaner political, economic and cultural development in a single land and the consequences of several competing nationalisms existing side by side are examined. Apartheid and African opposition to it are analyzed. Cross-listed with HIST 5451. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4455 - African Struggle for Independence

An assessment of African leadership from the colonial era to the present. Cross-listed with HIST 5455. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4460 - The Islamic World's Golden Age

The Islamic world's golden age before European expansion was characterized by sophisticated business institutions, scholarship, new technologies, and art. This class asks: What roles did Islam play in connecting diverse societies across broad regions? What characterized these territories? Cross-listed with HIST 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4461 - The Modern Middle East

Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with HIST 5461. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4462 - Islam in Modern History

This course studies Islamic thought and practice over the last two centuries in terms of major historical processes that have operated at local, national, and global scales. Cross-listed with HIST 5462, RLST 4462, RLST 5462. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4471 - The Second World War

The War in its totality: causes, military strategies (equal treatment to European and Pacific theaters), campaigns, impact of technology and weapons, political and social upheaval. Cross-listed with HIST 5471. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4472 - The 1950s: Korean War, the Cold War and Social Transformation

A critical and methodical exploration of several of the social, cultural, and political events of the 1950s. Investigates the complex interaction between politics and culture during this decade, paying close attention to anti-Communist thought and the Korean War. Cross-listed with HIST 5472. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4475 - The Vietnam War

Covers the conflict in Vietnam, with roots in the period prior to World War II. Main topics include the rise of nationalism in French Indochina, the war against the French, the Northern move to unify Vietnam, American intervention, and eventual victory of the Northern regime. Cross-listed with HIST 5475. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4490 - Weapons of Mass Destruction

Weapons of mass destruction have affected politics, health, and environments around the globe. This course will examine the development, use, and consequences of these modern technologies of war and terror. Cross-listed with HIST 5490. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4491 - United States History, 1865-1919

Surveys the major intersections of politics, culture, and society in American history between 1865 and 1919. The course will be attentive to the diversity of American experiences and will explore domestic and international themes in United States history. Cross-listed with HIST 5491. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4492 - United States History, 1919-1945

Surveys the major intersections of politics, culture, and society in American history between 1919 and 1945. The course will be attentive to the diversity of American experiences and will explore both domestic and international themes in United States history. Cross-listed with HIST 5492. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4493 - United States History, 1945-1973

Surveys the major intersections of politics, culture, and society in American history between 1945 and 1973. The course will be attentive to the diversity of American experiences and will explore both domestic and international themes in United States history. Cross-listed with HIST 5493. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4494 - United States History, 1973-Present

Surveys the major intersections of politics, culture, and society in American history since 1973. The course will be attentive to the diversity of American experiences and will explore both domestic and international themes in United States history. Cross-listed with HIST 5494. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4501 - World History for Educators

Introduces world history for candidates for teaching positions. Discussion of themes, problems of research and interpretation, and relevant instructional methods. Prereq: Upper division standing. Cross-listed with HIST 5501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4503 - Topics in History of Science

Themes vary from year to year. Possible topics: Darwinism, Nature of Memory, Time and Space, Origins. Cross-listed with HIST 5503. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4504 - Animals in U.S. History

Human-animal relationships offer powerful and unexpected perspectives on the American past. An eclectic range of readings and viewings, written assignments and contemplative experiences will contextualize contemporary practices, beliefs, and ethics -- vegetarianism, hunting, pet-keeping, and many others -- in historical context. Cross-listed with HIST 5504. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4621 - Explorers and Exploration

Examines the history of travel and exploration from the 13th century to the present. Readings draw primarily from first-person accounts to understand why people voyage, what they hope to discover, and what happens to them along the way. Cross-listed with HIST 5621. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4622 - Oceans In History

Explores emerging historical scholarship of transoceanic exchanges, relations, and transformations in early modern world history. Examines how historians analyze and conceptualize global interactions. Topics include voluntary and forced migrations, resistance and revolution, transoceanic economic relations, piracy, and environmental change. Cross-listed with HIST 5622. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4645 - Archival Management

This course studies theory and principles pertaining to the management of current and non-current records, public and private archival materials, as well as the administration of archival manuscript depositories for housing records of historical value. Cross-listed with HIST 5645. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4810 - Special Topics

Cross-listed with HIST 5810. Max hours: 12 Credits. **Semester Hours:** 1 to 3

HIST 4839 - History Seminar

Covers the use of documentary sources and historical criticism, with students utilizing these skills in a historical research paper. Note: Required for history majors. Preferably taken in the senior year. Prereq: HIST 3031 with a grade of C or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4840 - Independent Study: HIST

Max hours: 12 Credits. **Semester Hours:** 1 to 3

HIST 4849 - Independent Study History Honors Research Paper

Students competing for history honors must take this course to prepare their honors paper. The course requires students to produce a finished research paper of professional quality under the direction of a history faculty member. Prereq: Open to advanced history majors only. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 4850 - History in the Community: History Day Mentoring

Under direction of UCD history faculty, students participate in the Denver Public Schools National History Day program. They gain teaching experience by mentoring DPS students in preparation of History Day projects, and may also participate in judging local and state History Day contests. Prereq: Permission of department chair. Max hours: 3 Credits. **Semester Hours:** 1 to 3

HIST 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty

prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HIST 5027 - Enlightenment and Revolution

In this course students explore the relationship of ideas and events in Europe during the 17th and 18th centuries. Modernizing trends in the European economy, religion, science, states and international affairs leading up to the French Revolution. Cross-listed with HIST 4027. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5028 - Nations and Classes: 19th Century Europe

Focuses on material and ideological changes in 19th century Europe, exploring social, cultural, political, economic, and intellectual developments. Cross-listed with HIST 4028. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5029 - Age of Anxiety in Europe

Looks at Europe at the end of the nineteenth century in an effort to determine if there is any relation between the peculiarities in culture at the time and the horrors in politics that followed. Cross-listed with HIST 4029. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5030 - Europe During the World Wars

Covers the history of the two world wars and their origins, political and social upheaval during the interwar economic crisis, the rise of communism, Italian fascism and Nazism, with an emphasis on cultural production and intellectual life. Cross-listed with HIST 4030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5031 - Contemporary Europe

History of Europe since 1945. Students study the economic, social, and political history of Europe since World War II, with a special emphasis on the Cold War and intellectual currents. Cross-listed with HIST 4031. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5032 - Globalization in World History Since 1945

An interdisciplinary course on contemporary world history and globalization. While the course is historically structured, economic, political, and sociological matters are explored. Cross-listed with HIST 4032. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5034 - Core Themes in European History

Core themes in modern Europe, 1750 to the present. Cross-listed with HIST 4034. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5035 - Crisis and Transformation: Europe's 20th Century

This course examines 20th century European history focusing on themes of crisis and transformation. We will explore how devastating wars, economic depression, stark ideological divisions, and revolutionary social, political and cultural movements dramatically changed Europe over the course of the century. Cross-listed with HIST 4035. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5046 - Victorians and Victorianism

Taking an interdisciplinary perspective, this course examines English people and English life during the reign of Queen Victoria, 1837-1901. What were the defining features of the Victorian age? What did it mean to be "Victorian?" When and why did the Victorian paradigm break down? Cross-listed with HIST 4046. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5051 - Britain and The Empire

Examines 19th and 20th century British history, addressing social, cultural, and political themes. Explores industrialization, state growth, and imperialism; relationships between race, gender, and class; and the ways in which colonizers and the colonized experienced empire. Cross-listed with HIST 4051. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5055 - The Atlantic Slave Trade: Africa, Caribbean and U.S.

Presents a broad overview of the slave trade in the Atlantic World, including discussion of the slave plantation, the creation of Caribbean societies and the consequences of independence from Britain. Cross-listed with HIST 4055. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5062 - Modern France: 1789 to the Present

Considers the shaping of modern France from the 18th century Bourbon Monarchy and aristocratic society to today's liberal democracy, in which multiculturalism, globalization and supranational institutions call into question the very nature of French identity. Cross-listed with HIST 4062. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5071 - Modern Germany

Surveys the major political, institutional, social, economic, and cultural developments that have occurred in Germany since the late 18th century. Cross-listed with HIST 4071. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5074 - Post-War Germany

Historical survey of Germany since the second world war, with an emphasis on culture and society. Cross-listed with HIST 4074. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5075 - Travel Stories and Origins of Cultural Anthropology

Examines the early history of cultural anthropology by means of classic travel literature. Cross-listed with HIST 4075. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5076 - History of Modern Science

Surveys the history of science from the 18th century to the present. Treats all disciplines, from physics to physiology, in an attempt to understand how the natural world came to dominate our sense of ourselves. Cross-listed with HIST 4076. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5082 - Reform and Revolution in Russia: The 1860s to 1917

Emphasis upon Russia's attempts to modernize, beginning with great reforms of the 1860s and 1870s; increasing polarization of government and opposition groups. Examines governmental point of view through several monographs and revolutionary theory, including those of Marx, Engels, Lenin and Trotsky. Cross-listed with HIST 4082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5083 - Russia Since 1917

Studies the development of the Soviet Union from its formation in the October Revolution, through the Civil War, the new economic policy, industrialization, collectivism, the Stalinist purges, up to the present. Cross-listed with HIST 4083. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5086 - Eastern Europe

Studies the countries of Eastern Europe from their origins in the Middle Ages to the present. Cross-listed with HIST 4086. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5133 - Management of Material Culture and Museum Collections

This course provides in-depth knowledge of the rudiments of material culture documentation, preservation and management. While we have designed this class for those interested in working in history museums, this is also appropriate for those students who want to learn the place of artifacts in studying history. Cross-listed with HIST 4133. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5201 - Core Themes in U.S. History

This course surveys major themes in U.S. history. Cross-listed with HIST 4201. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5210 - The American Revolution

The crisis of the British Empire in North America from the end of the French and Indian War to the ratification of the American Constitution. Topics include the emerging economy, constitutional arguments against Britain, the conduct of the war, and the definition of a republic. Cross-listed with HIST 4210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5212 - Civil War and Reconstruction

Begins with the causes and outbreak of the American Civil War, describes the military conflict and the social aspects of the war, and examines the federal efforts to reconstruct the southern states and protect the rights of Black citizens after 1865. Cross-listed with HIST 4212. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5213 - The Gilded Age and Early 20th Century Challenges: U.S. History, 1865-1932

Topical study of major events in America, including Reconstruction; the rise of industry and the workers' response; westward expansion and the plight of Native Americans; urbanization and immigration; agrarian upheaval; Progressivism; World War I; the challenges of the 1920s and the onset of the Great Depression. Cross-listed with HIST 4213. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5216 - History of American Popular Culture

Explores the evolution of film, radio, television, and popular music from the 1940s to the 1980s. The course uses these and other forms of popular art to examine American history in this era. The course focuses on the shifting trends in popular culture, how that culture reflects the larger themes in American history, and how these media have impacted the national experience. Cross-listed with HIST 4216. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5217 - Consumer Culture

This interdisciplinary course examines the dynamics of the consumer culture in the context of social, economic, and technological history. The analysis begins with 17th century European origins, and continue through recent world developments, emphasizing the U.S. since 1800. Note: Open to all students. Cross-listed with HIST 4217. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5219 - Depression, Affluence and Anxiety: U.S. History, 1929 to the Present

Examines major developments, focusing on the causes of the Depression and efforts to combat it; World War II and postwar readjustments; the Cold War and challenges of world leadership; unparalleled prosperity; Civil Rights movement; the Vietnam War; and economic uncertainties amid general prosperity. Cross-listed with HIST 4219. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5220 - U.S. Foreign Policy Since 1912

The main thrust is the emergence of the U.S. from isolation toward full-scale participation in the affairs of Europe and

other areas. Special attention is given to U.S. intervention in two world wars, the Cold War, and the overextension of U.S. commitments since 1960. Cross-listed with HIST 4220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5222 - U.S. Society and Thought to 1860

Major topics include the evolution of Protestantism from Puritans to Transcendentalists; humanitarian reforms such as abolition, temperance, and women's rights; European influences on American thought; the effect of industrialization on the development of class society; and American nostalgia for agrarian life. Cross-listed with HIST 4222. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5223 - U.S. Society and Thought Since 1860

Topical survey of the main currents of American thought and their impact upon society. Topics include American philosophy, literature (extensively), art, music, immigration and urbanization, technology, extremism of both left and right, and education. Cross-listed with HIST 4223. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5225 - Urban America: Colonial Times to the Present

Rise of the American city from colonial times to present. Major emphasis on the process of urbanization since 1840: town promotion, the industrial city, immigration, boss politics and reform, urban technology, transportation systems, minorities, city planning, and the future of urban America. Cross-listed with HIST 4225. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5226 - U.S. Business History

Surveys the major changes in business practices from colonial times to the present. Primary emphasis is placed on the Industrial Revolution and after. Topics include the emergence of major personalities in the Industrial Revolution; the rise of giant corporations; the response of industrial labor unions; government intervention and regulation; and the emergence of the post-industrial society. Cross-listed with HIST 4226. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5227 - American West

Introduces the diverse peoples, places, and approaches to the development of the trans-Missouri West from prehistoric times to the present. Cross-listed with HIST 4227. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5228 - Western Art and Architecture

Introduces Western art and architecture, emphasizing their historical context. Students are required to do book reports and a major research paper. Course includes walking tours and museum visits. Cross-listed with HIST 4228. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5229 - Colorado Historic Places

Introduces community architecture, folklore, and history for all students. Students learn how to survey, describe, and designate significant historical structures and districts. Cross-listed with HIST 4229. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5230 - Women in the West

Focuses on ways in which women, from the mid-19th century through the mid-20th century, of different races, classes, and ethnic background, have interacted and been active participants in the development of the Western states. Cross-listed with HIST 4230 and WGST 4230/5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5231 - History in Museums

This core course for the museum studies area of public history introduces students to the theory and practice of museum operations. It covers the basics of museum administration, museum collection and preservation, and museum interpretation from both theoretical and practical points of view. Cross-listed with HIST 4231. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5232 - Historic Preservation

Introduces the history, methodology, and goals of historic preservation. Guest speakers, field trips, research projects, and book reports. Cross-listed with HIST 4232. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5234 - Introduction to Public History

An overview of history outside the academic setting. Students have the opportunity to learn about jobs through on-site visits and presentations made by people engaged in a wide variety of occupations in history other than teaching. Cross-listed with HIST 4234. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5235 - Sports and American Society

Examines American society and culture through the history of recreational and professional sport. Issues include class, race, gender, religion, business and politics. Cross-listed with HIST 4235. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5236 - Colorado Mining and Railroads

Focuses on the transportation network that shaped the inland West, and its key role in the extractive industry that gave Colorado its start and nourished the highest state through adolescence. Cross-listed with HIST 4236. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5238 - U.S. History Through Fiction

Explores American history through novels, based on the idea that fiction offers a superb "window" through which to view the past, especially to understand the texture of American society. Cross-listed with HIST 4238. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5240 - National Parks History

Introduces how the National Park Service uses history to identify, designate, preserve, and interpret America's most outstanding historic and natural history sites. After tours of NPS sites, students select from a wide range of projects. Note: Open to all students. Cross-listed with HIST 4240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5242 - Oral History

Trains public history students in the collection of oral history interviews. Students master core readings on the theory, practice, and ethics of oral history. Cross-listed with HIST 4242. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5243 - Public History Administration

Introduces students to the skills, practice, and ethics of public history administration. Cross-listed with HIST 4243. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5244 - Interpretation of History in Museums: Exhibits and Education

This course allows students to gain in-depth knowledge of historical interpretation through exhibits and education in a museum setting. This class is designed for those preparing to work in history museums but is also appropriate for teachers and others who want to learn how museum programs interpret history with artifacts and other historical materials. Cross-listed with HIST 4244. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5245 - Heritage Tourism

History and historic sites have become big business in 21st century tourism. The heritage tourism industry is explored in this introductory course for all interested students focusing on how academic history and historians can partner with tourism and recreation interests. Cross-listed with HIST 4245. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5303 - Sex and Gender in Modern Britain

Examines modern British history by focusing on sex and gender as central aspects in people's lives. Considers the ways gender shapes the realms of politics, economics, society and culture in Britain from the 18th century to the present. Cross-listed with HIST 4303 and WGST 4303/5303. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5306 - Survey of Feminist Thought

Examines changes and continuities in feminist thought from the 18th century to the present, using historical and literary

materials. Explores the ways that women's characteristics, experiences, and capabilities have been understood and challenged. Cross-listed with ENGL 4306, 5306, HIST 4306, WGST 4306, 5306. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5307 - History of Sexuality

Explores the relationships between gender and norms, sexual practice, and ideas about sexuality in Europe and the United States. Examines how sex and sexuality have changed over time and how those changes relate to social, cultural, political and economic history. Cross-listed with HIST 4307 and WGST 4307/5307. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5308 - Crime, Policing, and Justice in American History

Focuses on changing legal and cultural definitions of crime, the role of the police, the evolution of punishment in theory and practice, and the role of mass culture in shaping the social history of crime and justice. Cross-listed with HIST 4308. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5345 - Gender, Science, and Medicine: 1600 to the Present

Examines the ways science and medicine have both shaped and been shaped by ideas about gender. Pays particular attention to the relationship between scientific/medical ideas about the sexes and the social organization of gender. Cross-listed with HIST 4345 and WGST 4345/5345. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5346 - Medicine and Society: the Ancients to the Present

Surveys change and continuity in definitions of health and illness, interactions between patients and practitioners, the practice of medical authority, and the relationships between science, clinical medicine, and the provision of health care. Cross-listed with HIST 4346. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5347 - History of Biology

Examines the development of modern biology from the mid-18th century to the present. Students will look at intellectual, methodological, institutional and social contexts in an attempt to answer the question of how biology became the "pre-eminent" science. Cross-listed with HIST 4347. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5348 - Mind and Malady: A History of Mental Illness

Examines the history of mental illness from the mid-18th century to the present, focusing on the institutionalization of the mentally ill, the origin of psychiatry, the development of models of mental illness and the evolution of clinical treatment. Cross-listed with HIST 4348. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5411 - Modern Mexico

Designed to familiarize students with the critical issues in Mexican political, economic and social history. Traces the emergence of independence and the difficult consolidation of an independent nation state. Cross-listed with HIST 4411, ETST 4411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5412 - Mexico and the United States: People and Politics on the Border

Examines the convoluted relations between these two republics, focusing on diplomatic, cultural and social interactions. Cross-listed with HIST 4412. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5414 - Nationalism and State Building in Latin America, 1750-1850

Explores the problems of nationalism and post-colonial state building by examining the late colonial and early national periods of Latin American history. The course discusses the impact of the enlightenment, the events of the Wars of Independence, and the quandaries faced by the new nations. Cross-listed with HIST 4414. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5415 - Social Revolutions in Latin America

A theoretical framework and an empirical basis for understanding the large-scale social movements that have influenced the course of Latin American nations. Cross-listed with HIST 4415. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5417 - Commodities and Globalization: Dessert in World History

Traces the impact of "dessert commodities" (sugar, cacao, vanilla and coffee) on Latin America during an early period of globalization (nineteenth century). Explores cultural shifts in North Atlantic countries that created the incessant demand for dessert. Prereq: Senior or graduate student standing. Cross-listed with HIST 4417. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5418 - Trade and Premodern Wrld Hstry

Explores the interconnections that shaped premodern world history, considering the ways that the production, exchange, and consumption of cloth were tied to specific forms of political power, social and religious organization, and long distance economic relationships. Cross-listed with HIST 4418. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5420 - Traditional China: China to 1600

A general introduction to the history of China from the advent of historic civilization to the point of the great encounter with the West. Cross-listed with HIST 4420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5421 - Modern China

Surveys Chinese history in the modern era. Includes examination of Western domination of China, revolution, and internal fragmentation of China; Japanese attacks and World War II; and civil war and the communist revolution. Cross-listed with HIST 4421. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5422 - Lvng thr Mao's China: Life, Mat. Cult, Movies, 1949-76

Introduces students to ordinary people's daily life in Mao's China (1949-1976) through an exploration of material culture, movies and scholarship. This course pays particular attention to the ways people's everyday living intertwined with politics. Cross-listed with HIST 4422. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5431 - Modern Japan

Course of Japanese history since the Perry expedition. Covers Japanese Westernization and industrialization, the expansion of empire and defeat in World War II, the occupation, and the amazing technological and social transformation since the occupation years. Cross-listed with HIST 4431. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5451 - Southern Africa

An in-depth history of the clash of peoples and cultures in Africa south of the Zambezi River. African and Afrikaner political, economic and cultural development in a single land and the consequences of several competing nationalisms existing side by side are examined. Apartheid and African opposition to it are analyzed. Cross-listed with HIST 4451. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5455 - African Struggle for Independence

An assessment of African leadership from the colonial era to the present. Cross-listed with HIST 4455. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5460 - The Islamic World's Golden Age

The Islamic world's golden age before European expansion was characterized by sophisticated business institutions, scholarship, new technologies, and art. This class asks: What roles did Islam play in connecting diverse societies across broad regions? What characterized these territories? Cross-listed with HIST 4460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5461 - The Modern Middle East

Cross-listed with HIST 4461. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5462 - Islam in Modern History

This course studies Islamic thought and practice over the last two centuries in terms of major historical processes that

have operated at local, national, and global scales. Restriction: Must have graduate standing in order to enroll in this course. Cross-listed with HIST 4462, RLST 4462, RLST 5462. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5464 - Problems and Methods in Teaching History and Social Studies I

Introduces students to problems and methods in secondary education history and social studies teaching. This course focuses primarily on the teaching of history. Note: Open to students in the Initial Professional Teacher Education program or a relevant graduate program, and to practicing teachers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5465 - Problems and Methods in Teaching History and Social Studies II

Introduces students to problems and methods in secondary education history and social studies teaching. This course focuses broadly on the teaching of all the social studies fields, including history, economics, government, and geography. Note: Open to students in the Initial Professional Teacher Education program or a relevant graduate program, and to practicing teachers. Prereq: HIST 5464. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5466 - Teaching About Ethnicity, Race, and Prejudice

Examines the history of ethnic identity and race relations in North America and applies that knowledge to teaching practices. Questions how teachers should approach the topics of race, ethnicity, and discrimination in our collective history and society. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5471 - The Second World War

The war in its totality: causes, military strategies (equal treatment to European and Pacific theaters), campaigns, impact of technology and weapons, political and social upheaval. Cross-listed with HIST 4471. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5472 - The 1950s: Korean War, the Cold War and Social Transformation

A critical and methodical exploration of several of the social, cultural, and political events of the 1950s. Investigates the complex interaction between politics and culture during this decade, paying close attention to anti-Communist thought and the Korean War. Cross-listed with HIST 4472. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5475 - The Vietnam War

Covers the conflict in Vietnam, with roots in the period prior to World War II. Main topics include the rise of nationalism in French Indochina, the war against the French, the Northern moves to unify Vietnam, American intervention, and eventual victory of the Northern regime. Cross-listed with HIST 4475. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5490 - Weapons of Mass Destruction

Weapons of mass destruction have affected politics, health, and environments around the globe. This course will examine the development, use, and consequences of these modern technologies of war and terror. Restriction: Must have graduate standing in order to enroll in this course. Cross-listed with HIST 4490. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5491 - United States History, 1865-1919

Surveys the major intersections of politics, culture, and society in American history between 1865 and 1919. The course will be attentive to the diversity of American experiences and will explore domestic and international themes in United States history. Cross-listed with HIST 4491. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5492 - United States History, 1919-1945

Surveys the major intersections of politics, culture, and society in American history between 1919 and 1945. The course will be attentive to the diversity of American experiences and will explore both domestic and international themes in United States history. Cross-listed with HIST 4492. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5493 - United States History, 1945-1973

Surveys the major intersections of politics, culture, and society in American history between 1945 and 1973. The course will be attentive to the diversity of American experiences and will explore both domestic and international themes in United States history. Cross-listed with HIST 4493. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5494 - United States History, 1973-Present

Surveys the major intersections of politics, culture, and society in American history since 1973. The course will be attentive to the diversity of American experiences and will explore both domestic and international themes in United States history. Cross-listed HIST 4494. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5501 - World History for Educators

Introduces world history for candidates for teaching positions. Discussion of themes, problems of research and interpretation, and relevant instructional methods. Prereq: Upper division standing. Cross-listed with HIST 4501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5502 - World History For Educators Workshops

Designed for world history teachers who wish to enhance their knowledge of world history content and pedagogy. If taken in total, the course is comparable to a college survey course in world history plus teaching guides. Max hours: 8 Credits. **Semester Hours:** 1 to 1

HIST 5503 - Topics in History of Science

Themes vary from year to year. Possible topics: Darwinism, Nature of Memory, Time and Space, Origins. Cross-listed with HIST 4503. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5504 - Animals in U.S. History

Human-animal relationships offer powerful and unexpected perspectives on the American past. An eclectic range of readings and viewings, written assignments and contemplative experiences will contextualize contemporary practices, beliefs, and ethics -- vegetarianism, hunting, pet-keeping, and many others -- in historical context. Cross-listed with HIST 4504. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5621 - Explorers and Exploration

Examines the history of travel and exploration from the 13th century to the present. Readings draw primarily from first-person accounts to understand why people voyage, what they hope to discover, and what happens to them along the way. Cross-listed with HIST 4621. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5622 - Oceans In History

Explores emerging historical scholarship of transoceanic exchanges, relations, and transformations in early modern world history. Examines how historians analyze and conceptualize global interactions. Topics include voluntary and forced migrations, resistance and revolution, transoceanic economic relations, piracy, and environmental change. Cross-listed with HIST 4622. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5645 - Archival Management

This course studies theory and principles pertaining to the management of current and non-current records, public and private archival materials, as well as the administration of archival manuscript depositories for housing records of historical value. Cross-listed with HIST 4645. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 5810 - Special Topics

Cross-listed with HIST 4810. Max hours: 9 Credits. **Semester Hours:** 1 to 3

HIST 5840 - Independent Study: History

Max hours: 9 Credits. **Semester Hours:** 1 to 3

HIST 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HIST 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

HIST 5995 - Travel Study

Created for students doing travel study in a foreign country; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

HIST 6013 - Introduction to the Professional Study of History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6840 - Independent Study: HIST

Max hours: 9 Credits. **Semester Hours:** 1 to 3

HIST 6920 - Readings in European History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6925 - Readings in Early U.S. History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6926 - Readings in Later U.S. History, 1865-1932

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6927 - Readings in Public History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6929 - Readings in Later U.S. History, 1929 to the Present

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6931 - Readings: Special Subjects in History

Readings in topics in history with varying subtitles reflecting course content. Prereq: Graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 3

HIST 6939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

HIST 6940 - Comprehensive Exam

Preparation for and completion of comprehensive examination for History MA. Max hours: 1 Credit. **Semester Hours:** 1 to 1

HIST 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

HIST 6951 - Masters Project: Advanced History Curriculum Development

Students develop curricula for secondary-level history courses; must demonstrate thorough knowledge of subjects; understanding of historiographic and methodological problems; command of primary sources and their uses in teaching; and describe teaching strategies, methods, and assessments to be used in the curricula. Prereq: Permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HIST 6952 - Master's Project: Public History

Public history students may use one to six credits to complete a single public history project. Projects can entail creating an exhibit, organizing a museum or archival collection, conducting a preservation survey or similar activities. Students are required to prepare a paper describing the process and results of the project. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HIST 6980 - Seminar in European History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6981 - Seminar in British History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6986 - Seminar in Later U.S. History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6989 - Seminar: Special Subjects in History

Max hours: 9 Credits. **Semester Hours:** 3 to 3

HIST 6992 - Seminar: Colorado Studies

This advanced interdisciplinary seminar on Colorado starts with a survey of the published literature. Students then select a research topic of their own and complete a publishable paper using primary sources. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HIST 6993 - Seminar: History of Technology

Explores American and worldwide cases, modern and pre-modern, of technological development through seminar readings and individual research. Considers how technologies evolve within historical contexts and how societies demonstrate values and beliefs as they manipulate nature, building lifestyles and social orders. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 5939 - Internship

- **Semester Hours:** 1 to 3

HLTH 6010 - Health Care Systems

Introduces the structure and function of the medical care delivery system. Includes basic concepts and measures of health, disease, quality, values, needs and utilization; issues in health care manpower, institutions and system organization; general issues in policy, reimbursement and regulation; broad community, and organizational considerations in medical care organizations. The student is introduced to the principles of epidemiology and environmental health and demonstrates the application of epidemiology concepts to planning for the healthcare service needs of a population. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6070 - International Health Policy and Management

A framework for understanding national health reform policy and management issues in the U.S. and other nations, including industrialized, developing, and transforming nations. This course combines classroom and on-line teaching. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6071 - Introduction To Health Information Technology

Examines what needs transforming in healthcare to improve value, safety, and appropriateness of care, and what the role of IT is in that transformation. IT also examines the challenges of cultural change and IT strategy in succeeding

with clinical information projects. Differences between installation, implementation, transition and actual transformation are suggested, and methods for managing subcultures in healthcare (IT, clinical, administrative) are reviewed. Cross-listed with ISMG 6071. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6072 - Management of Healthcare Information Technology

Provides an introduction to the management of information technology in healthcare. A description of information processing, the origin, content, evolution of healthcare information systems, and the methodologies deployed to acquire and manage information requirements are discussed. Cross-listed with ISMG 6072. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6075 - International Health Travel Study

Experiential course, which is designed to open students up to innovative health delivery practices in an international location. Students learn how health issues such as reproductive health, infectious diseases, mental health, health and economy, and chronic diseases are handled in community and public health settings. Class trips are usually 14-18 days to an Asian country during the month of January. Prereq: HLTH 6010 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6740 - Profiles in Health Care

This colloquium provides a rare opportunity for students to interact with top CEOs from health care organizations around the country. Students learn about HMOs, hospitals, medical group practices, consulting, managing careers, how to get jobs, and how to be successful in a job. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6770 - Healthcare Quality and Outcomes

Studies the identification, measurement and improvement of healthcare quality. Covers, historic and contemporary views of quality, improvement theories and methods, organizational quality systems, leadership, patient safety, cost and quality, quality measurement and reporting, clinical outcomes, care redesign and medical terminology. Restriction: Restricted to HLAD and MBAH majors within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6800 - Special Topics

Offered irregularly. Current interests in the health management field. Topics recently offered include: international health, ethics, general systems theory, and key issues for health systems. Consult the current 'Schedule Planner' for semester offerings. Prerequisites vary according to topics and instructor requirements. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HLTH 6840 - Independent Study: HLTH

Instructor approval required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Max hours: 8 Credits. **Semester Hours:** 1 to 8

HLTH 6911 - Health Field Studies

The objective of this course is to expose students to health care organizations with which they are not familiar. Each student is assigned to a health care organization and given a specific problem or project to complete. Prereq: HLTH 6010 or permission of instructor. After registration, please contact Errol.Biggs@ucdenver.edu for further instructions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 1012 - The Humanistic Tradition: Modes of Expression

Familiarizes students with humanistic modes of expression through the study of history, literature, philosophy, music, and the visual and dramatic arts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 4251 - Introduction to Legal Studies

A survey of the United States legal system, including lawmaking powers, jurisdiction, court procedures, professional ethics and major principles of business law, contracts, estates and probate, family law, property and torts. Cross-listed with HUMN 5251/SSCI 4241/SSCI 5251. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HUMN 4984 - Topics: Interdisciplinary Humanities

Concerned with specialized aspects of the humanities from various theoretical and research perspectives. These courses are interdisciplinary and serve as a forum for discussion of individual projects and theses. Max hours: 6 Credits. **Semester Hours:** 1 to 3

HUMN 5000 - 19th Century Philosophy

Covers the systematic work of such German idealists as Hegel, Fichte, and Shelling, as well as responses to those systems by such authors as Marx, Kierkegaard, and Nietzsche. Prereq: PHIL 3002 or 3022. Cross-listed with PHIL 4000/5000 and SSCI 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5010 - Problematizing Whiteness: Educating for Racial Justice

Critical Whiteness Studies provides a deeper analysis of race that accounts for both sides of the race coin: the plight of people of color AND how Whites are complicit. This class looks deeper into how race operates within White contexts and how that impacts people of color so we bridge how Whites AND people of color can work together towards a racially equitable society. Cross listed with ETST 4010, EDFN 4001, SSCI 5010 and EDFN 5001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5013 - Philosophical Problems in the Social Sciences and the Humanities

Presents an overview of key theoretical issues currently emerging across academic disciplines. Examines questions about reality, knowledge, ethics that affect social research and writing in the humanities. Readings explore how contemporary philosophical and cultural discourses have altered theory and method. Assignments include influential theoretical pieces by key historical and contemporary thinkers, examples of application in social research, and interpretations of thought and affect in cultural contexts. Cross-listed with PHIL/SSCI 5013. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5020 - Elements of Social Thought

Introduces students to the disciplines that comprise the social sciences (classical anthropology, sociology, sociology of religion, philosophy of history, political theory, classical psychology, etc.). Provides necessary tools for interdisciplinary students to understand the social infrastructure of contemporary society. Cross-listed with SSCI 5020 and PHIL 5020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5025 - Methods & Texts of Interdisciplinary Humanities & Social Theory

Exposes the beginning graduate student to exemplary works and methodologies of disciplines oriented to humanities and social sciences, such as philosophy, sociology, history, communication, fine arts, and literature. Cross-listed with SSCI 5025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5101 - Pragmatism: Classical American Philosophy

The most significant philosophical tradition born in the United States is pragmatism. Examines several of the most important classical works of this tradition, the influence of thinkers who have helped pragmatism, and the contemporary relevance of this tradition. Figures who may be included in this course are: Emerson, Pierce, Royce, James, Dewey, Mead, Rorty. Prereq: An introductory course in philosophy. Cross-listed with PHIL 4101, 5101, SSCI 5101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5220 - Aesthetics and the Philosophy of Art

Introduction to major theories of aesthetics and contemporary discussions of problems in aesthetics and the philosophy of art, including topics such as: the nature of art, interpretation and evaluation in art. Cross-listed with PHIL 4220/5220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5242 - Bioethics

Examines some of the major moral issues confronting the nation's health care system. The class will search for solutions to such problems as financing health care for those unable to do so on their own, determining the extent of a patient's right to both refuse and demand certain types of medical treatment, and allocating scarce medical resources such as life-saving vital organs. The springboard for examining these issues will be the doctor or patient relationship framed by the moral principles of respect for persons and beneficence. Cross-listed with PHIL 4242, PHIL 5242, SSCI 5242. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5250 - Environmental Ethics

While human industry/technology creates enormous material prosperity, it can result in devastating environmental damage. This course analyzes the moral values, consequences and duties implied in relationships between human beings, animals and ecological systems, while seeking out new and ethical approaches. Cross-listed with PHIL 4250/5250 and SSCI 5250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5251 - Introduction to Legal Studies

A survey of the United States legal system, including lawmaking powers, jurisdiction, court procedures, professional ethics and major principles of business law, contracts, estates and probate, family law, property and torts. Cross-listed with HUMN 4251/SSCI 4241/SSCI 5251. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5520 - The City Beautiful: Art, Architecture and Theory in Urban History

How did cities develop and what were the buildings that filled these spaces? Posing this question initially, this course takes a case-study approach to surveying the concerns confronting different cultures as they developed their urban environments sociologically, anthropologically, architecturally and spatially. Cross-listed with SSCI 5520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5540 - Law, Diversity and Community in United States History

Engaging extensive primary and secondary source material, course applies an interdisciplinary approach to diversity and conflict that often surrounds the quest for economic, moral and social inclusion in the United States. Restricted to Graduate level students. Cross-listed with SSCI 5540. Max hours: 3 Credits. **Semester Hours:** 0 to 0

HUMN 5550 - Paris 1910: Art, Philosophy and Psychology

Traces the influences of philosophy, psychology, and art in the English, French, and German-speaking worlds in the early twentieth century. This intellectual history is extended to broader cultural and political contexts. Key period is between 1910 and 1968, when modernity's key aspirations and tensions became explicit. Cross-listed with PHIL 5550 and SSCI 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5600 - Philosophy of Religion

Nature of religion and methods of studying it. Cross-listed with PHIL 4600, 5600, RLST 4060, 5060, and SSCI 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5650 - Reflections on Modernity

Explores modernity as a historical epoch and a theoretical space, looking at the commentaries and reflections of influential 20th century thinkers including Adorno, Arendt, Levinas, Merleau-Ponty, Habermas and Foucault. Examines how the theoretical inclinations of modernity were influenced by politics, art, literature and culture. Cross-listed with PHIL 5650 and SSCI 5650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5660 - Visual Arts: Interpretations and Contexts

Provides graduate-level interdisciplinary study in the historiography, methodologies, and theories used to understand how visual arts, including painting, sculpture, photography, film and performance art influence the making of culture. Students gain critical skills for analyzing a variety of visual and aesthetic products of culture. Prereq: Upper-division undergraduate or graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5710 - Women and Religion

A sociological exploration of the contemporary roles of women in religion. Course examines American and world religious groups with an eye to women's involvement. Considers how women have changed these traditions as they take on leadership roles and discusses the tensions that arise within these traditions as a result of their expanded participation. Cross-listed with SSCI 4710/5710, WGST 4710/5710, RLST 4710/5710. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5720 - Sexuality, Gender and Their Visual Representation

Studies sexuality, gender and identity representation from classical antiquity through the present in the visual arts. Uses the literature of visibility, feminism, race and queer theory. Explores representations of femininity, masculinity and androgyny and their reinforcement and challenge to gender-identity norms. Cross-listed with SSCI 5720 and WGST 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5750 - Philosophical Psychology

Explores debates about psyche and body, mind and world, self and others, and consciousness and nature. Examines the philosophical questions related to those debates that arise within theories of perception, affect and cognition offered by influential psychological models. Cross-listed with PHIL 5755, SSCI 5750. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5770 - Imperialism, Post-Colonial Theory & Visual Discourse

Western empires disseminate political, social, economic & cultural practices through complex interplay of cultural practices. Visual production is a complex site for meaning making within imperialism. Examines how visual discourses operated to create meaning for audiences, through focus on postcolonial critique. Cross-list SSCI 5770. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5833 - Existentialism

Examines one of the most influential movements in recent European thought, beginning with existentialism's 19th century roots, and continuing on to the existentialist philosophers of the 20th century. Figures covered may include Dostoyevsky, Kierkegaard, Nietzsche, Heidegger, Sartre and de Beauvoir. Cross-listed with PHIL 4833/5833 and SSCI 5833. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5840 - Independent Study: HUMN

Max hours: 9 Credits. **Semester Hours:** 1 to 3

HUMN 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

HUMN 5920 - Philosophy of Media and Technology

A philosophical examination of interrelationships between contemporary media, technology, and their impacts upon character of contemporary life and values. Topics may include ethics, epistemology, democracy, advertising, media literacy and criticism. Cross-listed with PHIL 4920, 5920, SSCI 5920. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5924 - Directed Research and Reading in Interdisciplinary Humanities

Provides background reading, theory and research approaches for students to develop a thesis, project, or an individualized theme for the oral exam based on their interdisciplinary focus. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5933 - Philosophy of Eros

What does it mean to understand philosophy as an erotic activity? This question will be examined, first by studying Plato's dialogues-such as Lysis, Symposium and Republic-and then by reading texts from Sigmund Freud, Michael Foucault and others. Cross-listed with PHIL 4933, WGST 4933/5933 and SSCI 5933. Max hours: 3 Credits. **Semester Hours:** 3 to 3

HUMN 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

HUMN 5950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

HUMN 5960 - Master's Project

Max hours: 8 Credits. **Semester Hours:** 1 to 8

HUMN 5984 - Topics: Interdisciplinary Humanities

Max hours: 9 Credits. **Semester Hours:** 3 to 3

HUMN 6010 - Methods and Theories of Feminism and Gender

This course provides graduate-level interdisciplinary study in historiography, methodologies and theories of women's, gender, and sexuality studies and considers how culture is constructed around these categories. Cross-listed with WGST and SSCI 6010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IDST 4000 - Special Topics

Cross-listed with IDST 5000. Note: May be taken more than once for credit when topics vary. Max hours: 9 Credits. **Semester Hours:** 1 to 3

IDST 5000 - Special Topics

Cross-listed with IDST 4000. Note: May be taken more than once for credit when topics vary. Max hours: 9 Credits. **Semester Hours:** 1 to 3

INTB 2939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 3

INTB 3000 - Global Perspectives

Globalization brings both opportunities and anxieties that need to be fully explored, discussed and understood both by the business and non-business student. This interdisciplinary course is designed to stimulate thought, perspective, discussion and debate for business and non-business students on issues ranging from globalization; political economy and geopolitics; the environment; cultures; finances; economic integration; trade; global regions; emerging markets; human rights; terrorism and conflict; leadership, ethics and values; entrepreneurship, to future trends in global issues. The Global Perspective course is designed (1) to increase and promote both business and non-business students' capacity for international understanding and international enterprise through the study and discussion of global business environment-related issues from multiple points of views in a neutral forum. (2) It is to provide students with the awareness that global issues cannot be viewed in isolation, Restriction: Restricted to undergraduate majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 3901 - The Construction of the European Union

An overview of past and future development in Europe, including economic, political, and social aspects from the point of view of EU members, bordering countries, and world powers. The single market and its repercussions for businesses and the impact of the creation of a single market are studied. Offered through the ACI Semester in Paris program.

Prereq: Acceptance to the ACI program. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 3902 - Intercultural Management: European Values and Behavior

An in-depth study of European cultural differences and what unites the European nations. Histories and cultures of European countries are used to understand differences in communication, management, and organizational development. Case studies provide a synthesis of European and U.S. management practices. Offered through the ACI Semester in Paris program. Prereq: Acceptance to the ACI program. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 3903 - International Business Law

Provides a legal framework necessary for international business transactions and judicial risks. Combining theory and case studies, the course covers contract law, dispute settlement, and international business specific operations: international sales, distribution and exclusive concession contracts, franchise contracts, commercial agency contracts, and technology transfer contracts. Prereq: BLAW 3000/3050. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 3904 - International Negotiation

Studies the position of the company in the international marketing process; general knowledge of negotiators' external environments; preparation of a negotiation and the negotiating process; and expression of each party within the context of a contract. Offered through the ACI Semester in Paris program. Prereq: Acceptance to the ACI program. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 3939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. To enroll in an internship, students must work with the Experiential Learning Center on campus and have a 2.40 GPA or higher. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 1 to 3

INTB 4028 - Travel Study Topics

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 4200 - International Marketing

Studies managerial marketing policies and practices of firms marketing their products in foreign countries. Analytical survey of institutions, functions, policies, and practices in international marketing. Relates marketing activities to market structure and environment. Prereq: MKTG 3000 with a C or higher. Cross-listed with MKTG 4200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 4370 - International Financial Management

Financial management in the international environment. Topics include international capital movements; international operations as they affect the financial functions; foreign and international institutions; and the foreign exchange process. Also considers foreign exchange theory and risk management, financial requirements, problems, sources, and policies of firms doing business internationally. Prereq: FNCE 3000 with a C or higher. Cross-listed with FNCE 4370. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 4400 - Environments of International Business

An overview of the environmental complexities that arise when business activities and firms cross national borders. Key international business environmental complexities associated with country differences, cross-border trade and investment, and global monetary system are examined. Prereq: MGMT 3000 with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with MGMT 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 4410 - Operations of International Business

Focuses on the impact of environmental factors on international business operations and the identification and analysis of complex strategic and operational issues facing business firms in global markets. The strategies and structures of international businesses, alternative foreign market entry modes, and the unique roles of various business functions at international business firms are explained and assessed. Prereq: INTB 4400 or MGMT 4400. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with MGMT 4410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 4950 - Special Topics in International Business

Current topics in international business are occasionally offered. Consult the 'Schedule Planner' for specific course offerings or contact an advisor for information. Prereq: Topics vary depending on the topic and the instructor requirements. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

INTB 5800 - Special Topics in International Business

Current topics in international business are occasionally offered. Consult 'Schedule Planner' for specific course offerings or contact an advisor for information. Prereq: Topics vary depending on the topic and the instructor requirements. Max hours: 9 Credits. **Semester Hours:** 3 to 3

INTB 5939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. Prereq: 21 semester hours and a 3.5 grade-point average. Max hours: 9 Credits. **Semester Hours:** 1 to 3

INTB 6000 - Introduction to International Business

An overview of the international business environment, the impact of environmental factors on international business operations, and the identification of current and complex managerial issues facing organizations engaged in international business. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6020 - Cross-Cultural Management

Focuses on the management of diverse socio-cultural and political norms and values in the global marketplace. The goal of this course is to develop skills in managing impacts of such values and norms on the effectiveness of international business operations and managerial activities. Prereq: INTB 6000 or permission of instructor. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6022 - International Business Negotiations

Examines the international dimensions of business negotiations. It addresses the impact of the cultural, legal, political environments in the negotiation process, and examines similarities and differences in negotiation styles and approaches across borders. (This course qualifies as an international elective for the MS in International Business program.) Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6024 - International Trade Finance and Management

Provides an overview of international trade finance and trade management. It examines the roles played by various parties involved in international trade, addresses key methods of international payment and related financing, and provides practical experiences on how to manage the import and export trade management process. (This course qualifies as an international elective for the MS in International Business program.) Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6026 - International Marketing

Explores problems, practices, and strategies involved in marketing goods and services internationally. Emphasizes analysis of uncontrollable environments, legal systems, and economic conditions, as they affect international marketing planning. (This course qualifies as an international elective for the MS in International Business program.) Prereq: BUSN 6560 or BUSN 6561. Note: Students cannot receive credit for both MKTG 6020 and INTB 6026. Cross-listed with MKTG 6020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6028 - Travel Study Topics

Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 9 Credits. **Semester Hours:** 3 to 3

INTB 6030 - 11-Month MBA International Business Study Abroad

The 11-Month MBA International Business Study Abroad is an experiential learning course conducted abroad. Available for 11-Month MBA students only. **Semester Hours:** 3 to 3

INTB 6040 - Managing Global Talent

This course has two objectives: (1) to understand the impact of cultural differences in the management of people in multinational firms; and (2) to compare and contrast critical human resource issues in the contexts of domestic and international operations. Topics include recruitment, staffing, training, performance appraisal, compensation, and labor and management relations in markets around the world. (This course qualifies as an international elective for the MS in International Business program.) Prereq: BUSN 6520 or BUSN 6521 or MGMT 6380 with a grade of C (2.0) or higher. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Cross-listed with MGMT 6040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6060 - The Legal Aspects of International Business

Analyzes the legal aspects of international business transactions and considers risk-reducing mechanisms such as letters of credit and arbitration. The course examines NAFTA, the European union, and other international trading structures and rules, giving the background for export or import activities. (This course qualifies as an international elective for the MS in International Business program.) Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6082 - Marketing in Emerging Markets

Explores problems, practices, and strategies involved in marketing goods and services in emerging markets. Emphasizes analysis of uncontrollable environmental forces, including cultures, governments, legal systems, and economic conditions, as they affect the marketing plan. (This course qualifies as an international elective for the MS in International Business program.) Prereq: BUSN 6560. Note: Students cannot receive credit for both MKTG 6080 and INTB 6082. Cross-listed with MKTG 6080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6094 - Marketing Issues in the Chinese Environment

This course assesses numerous marketing and marketing related topics in the Chinese environment with the objective of helping the graduate student develop managerial and marketing expertise. In specific, the course pinpoints key developments in the Chinese business environment, develops expertise in conducting market opportunity analysis, assesses market entry conditions and strategies and applies marketing mix strategies in the context of the Chinese environment. Note: It is recommended for students to take BUSN 6560 or INTB 6000 prior to this course. Cross-listed with MKTG 6094. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6200 - International Business Policy

The objective of this course is to develop competence relevant to strategy formulation and implementation in a multi-national enterprise, and in an international context. Provides theoretical knowledge, skills, and sensitivities that help deal effectively with the strategic and managerial problems of managing in a global environment. Prereq: INTB 6000 and 18 graduate credit hours. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6370 - International Accounting

Designed to expose students to the international aspects of accounting and financial management. Includes discussion of some of the different financial accounting practices across countries; financial statement analysis in a global context. IFRS's are reviewed and compared with the requirements of US GAAP. Note: Students cannot receive credit for both ACCT 6370 and INTB 6370. Prereq: BUSN 6550 or equivalent. Cross-listed with ACCT 6370 and ACCT 4370. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6372 - International Financial Management

Addresses financial management in an international context that considers international capital movements and foreign exchange problems, and international operations as they affect financial functions. It reviews foreign and international institutions and the foreign exchange process and considers financial requirements, problems, sources, and policies of firms doing business internationally. Meets concurrently with FNCE 6370. Prereq: BUSN 6640. Cross-listed with FNCE 6370. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6411 - International Corporate Governance

Discusses the structure and goals of the modern corporation, the primary governance mechanisms used to help companies achieve these goals, how and why these roles, goals, and mechanisms vary across nations. The topics to be covered in the course include how share ownership, particularly by institutional shareholders, managerial compensation and board of director activities are being used to improve corporate governance systems. The class compares the Codes of Best Governance Practices from several countries as well as recent innovations in individual company governance rating systems. (This course qualifies as an international elective for the MS in International Business program.) Prereq: BUSN 6640. Note: Students cannot receive credit for both FNCE 6411 and INTB 6411. Cross-listed with FNCE 6411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6460 - Emerging Market Finance

This course aims to explore key emerging market finance issues from the perspectives of corporations, investors and markets. Emerging economies are deemed to be the engine of growth opportunities in the world economy. However, compared with developed markets, they typically have some unique features in their economic systems and financial markets, and thus different risk and return characteristics, leading to special considerations of capital budgeting, financing and investing in these economies. This course is to help develop a better understanding of financial markets, corporate finance and investments in emerging economies, with case studies on some major emerging markets (e.g., China, India). Prereq: BUSN 6620 and 6640. Cross-listed with FNCE 6460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6500 - International Business Consulting

This action-learning course provides students the opportunity to work with and consult for a company at the senior executive level (e.g., CEO, Business Unit heads) in order to add value to the firm's international business. Students will apply international business principles and practices to address a strategic, functional, operational, or geographic opportunity facing a sponsoring organization. In addition, students will gain "on the job learning" of key protocols in an international business consulting context. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6750 - Research Methods in International Business

Focuses on three major issues: (1) research design from an international management perspective (e.g., qualitative, quantitative and ethnographic); (2) topical issues (e.g., culture, international negotiations, mergers and alliances); (3) trends in international business research (e.g., cross-national project teams, emerging theoretical perspectives). This course qualifies as an international elective for the MS in International Business program. Note: Available to students as Independent Study only. Prereq: INTB 6000 and BUSN 6530 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6800 - Special Topics in International Business

Current topics in international business are occasionally offered. This includes international field study courses. Consult the 'Schedule Planner' for specific course offerings or contact an advisor for information. (This course qualifies as an international elective for the MS in International Business program.) Prereq: Topics vary depending on topic and instructor requirements. Max hours: 12 Credits. **Semester Hours:** 3 to 3

INTB 6840 - Independent Study

Instructor approval required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. (This course qualifies as an international elective for the MS in International Business program.) Max hours: 9 Credits. **Semester Hours:** 1 to 8

INTB 6870 - Global Climate Change

Global climate change may be one of the most important challenges facing business in the 21st century. This course will introduce the potential impacts of climate, then discuss possible regulatory responses to and business risks and opportunities that may emerge if climate change occurs. Cross-listed with BUSN 6870. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTB 6950 - Master's Thesis

Prereq: INTB 6750. Max hours: 8 Credits. **Semester Hours:** 1 to 8

INTE 2500 - Digital Media and Learning

Digital media have transformed where, how, and why people learn. This course examines theoretical foundations and contemporary developments in digital media and learning. Students will analyze, design, and enact projects

exemplifying topics such as civic media, game-based and mobile learning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 4000 - Design Thinking and Educational Innovation

Design thinking is a creative, human-centered approach to exploring and solving professional and community-based problems of practice. In this studio-based course students will cultivate academic and community partnerships, design innovative media and experiences, and support diverse learning opportunities across settings. Cross-listed with INTE 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 4320 - Games and Learning

This course examines the use of games for learning and education across formal and informal environments. Students will survey contemporary learning theory, media, trends, and challenges related to designing and playing games in informal, community-based, online, and school settings. Cross listed with INTE 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 4340 - Learning with Digital Stories

This course reviews the uses of digital storytelling for learning. Develop and publish a short digital story that tells something important about you and your interests. Explore ways that creating or using digital stories can aid learning and personal growth. Cross-listed with INTE 5340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 4665 - Social Media and Digital Cultures

The focus of this course is on how educators leverage networked social tools, technologies, and environments to address educational needs, opportunities, and problems of practice; and establish and nurture their own professional learning through participation in digital cultures. Cross-listed with INTE 5665. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5000 - Design Thinking and Educational Innovation

Design thinking is a creative, human-centered approach to exploring and solving professional and community-based problems of practice. In this studio-based course students will cultivate academic and community partnerships, design innovative media and experiences, and support diverse learning opportunities across settings. Cross-listed with INTE 4000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5200 - The Online Educator

This course helps educators transition to teaching online. Create online learning activities, assessments, and resources. Learn how to establish a strong online teaching presence. Explore blended learning environments, use of set curriculum, open educational resources (OER), family support, communication strategies, digital citizenship, and accessibility concerns. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5250 - Teaching Strategies for Online and Blended Learning

This course provides a foundation for effective online teaching strategies. Learning essentials include: affording more reflective, engaging, inventive, and successful online learning experiences; fostering improved presence; employing skilled management techniques; and unpacking tools, habits, and processes for effective learning. Max hours: 3 Credits.

Semester Hours: 3 to 3

INTE 5300 - Media Literacy

In this course students learn to create, use, extend, and evaluate media products to support decision-making and real world problem-solving. Students also become more aware of the significant role of mass media, popular culture, and digital media in our lives. Cross listed with INTE 4300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5320 - Games and Learning

This course examines the use of games for learning and education across formal and informal environments. Students will survey contemporary learning theory, media, trends, and challenges related to designing and playing games in informal, community-based, online, and school settings. Cross listed with INTE 4320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5340 - Learning with Digital Stories

This course reviews the uses of digital storytelling for learning. Develop and publish a short digital story that tells something important about you and your interests. Explore ways that creating or using digital stories can aid learning and personal growth. Cross-listed with INTE 4340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5660 - Developing Self-Paced Online Courseware

Students use a variety of tools and strategies to develop self-paced eLearning courseware, such as tutorials. The course covers critical aspects of the instructional development process that support the creation of effective self-paced online learning experiences, materials and resources. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5665 - Social Media and Digital Cultures

The focus of this course is on how educators leverage networked social tools, technologies, and environments to address educational needs, opportunities, and problems of practice; and establish and nurture their own professional learning through participation in digital cultures. Cross-listed with INTE 4665. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5670 - Planning and Facilitating Live Events

Webinars and other live online events are an increasingly popular approach to the delivery of learning and professional development opportunities. Informed by theory and research, students plan for and facilitate live learning events

delivered via synchronous online technologies. Prereq: INTE 5660 or permission of instructor. Max hours: 3 Credits.
Semester Hours: 3 to 3

INTE 5680 - Producing Media for Learning

Students develop and integrate media resources into eLearning environments, applying principles of media selection and multimedia learning. Students explore a variety of tools for producing audio, video, and multimedia content and examine ways to enhance eLearning courses through multimedia presentation and engagement resources. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 5830 - Workshop: Learning Technologies

Specific titles vary depending upon the specific skill areas within learning technologies. Max hours: 12 Credits.
Semester Hours: 0 to 4

INTE 5840 - Independent Study: Learning Technologies

Max hours: 9 Credits. **Semester Hours:** 1 to 4

INTE 5990 - Special Topics: Learning Technologies

Max hours: 30 Credits. **Semester Hours:** 1 to 6

INTE 5998 - Professional Development Activities

Provides guidance for professional development through participation in appropriate state, regional, and national conferences. Meet and engage with leaders in the field while upgrading professional knowledge and skills. Prereq: Enrollment in a graduate INTE program or a professional in a field related to the conference. Max hours: 4 Credits.
Semester Hours: 1 to 2

INTE 6710 - Creative Designs for Instructional Materials

This course is a project-based exploration of design theories, principles, and best practices for communicating information to diverse learning audiences. Students apply unique design approaches and formats to the creation of materials for teaching, learning, and being of service to underrepresented communities. Max hours: 3 Credits.
Semester Hours: 3 to 3

INTE 6720 - Research in Learning Design and Technology

Analysis, evaluation, and production of research in instructional technology. Methods for observing instruction, assessing learning, and collecting participants reports to improve instruction. Development of recommendations for action based on research findings. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 6750 - E-Learning Trends & Issues

This course examines definitions, history, core concepts, and current trends and issues related to the practice of instructional technology. Topics include instructional systems design, theories of learning and instruction, change management, performance improvement, emerging technologies, equity and access, and mobile learning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 6840 - Independent Study: Learning Technologies

Max hours: 9 Credits. **Semester Hours:** 1 to 4

INTE 6930 - Internship: Learning Technologies

Placement in a business, school or field setting where professional skills are applied to assess needs, design, develop and evaluate an instructional system, and provide leadership for change. Max hours: 12 Credits. **Semester Hours:** 1 to 4

INTE 6999 - Leadership for Technology Innovation

This course examines principles and strategies for leadership in a school, library, district, or organization aiming to improve its use of educational technology. Course learning essentials include how to: deal with competing voices; promote organizational change; assess and analyze technology use; pursue continuous improvement; employ strategic planning practices; implement effective programs; ensure sound professional development; wrestle with pressing leadership challenges; and secure funding (grant writing). Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 7100 - Professional Learning and Technology

Examines research surrounding the design and delivery of professional development (PD) programs in K20 and workplace settings. Projects and activities address: adult learning; PD models; design and; performance support and evaluation; career development and digital presence; and online tools. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 7110 - Mentoring, Coaching and Training

In this course students examine research surrounding the design and delivery of professional learning (PL) programs in K20 and workplace settings. Projects and activities address: adult learning; PL models; design and; performance support and evaluation; career development and digital presence; and online tools. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 7130 - Improving Workplace Performance

In this course students develop and evaluate large-scale learning initiatives in K20 and workplace settings. Topics include: frameworks for evaluating job performance based on professional learning standards; planning, delivering, and

evaluating professional learning initiatives; research models; and performance improvement tools and resources. Max hours: 3 Credits. **Semester Hours:** 3 to 3

INTE 7930 - Internship: Professional Learning

Working under the direction of field and academic supervisors in field settings, contribute to projects intended to help educators and other workers improve their job performance. Apply your knowledge to complex problems of practice, thus preparing for ongoing leadership opportunities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMA 2840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ISMA 3100 - Learning Across Disciplines

Examining a compelling issue, students will learn what kinds of questions require thinking beyond a single discipline, how interdisciplinary scholars combine a variety of fields, and how to approach the challenges of interdisciplinary writing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMA 3840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ISMA 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ISMA 4840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

ISMA 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

ISMA 4900 - Interdisciplinary Studies Capstone

While working with their Primary Faculty Advisors on their capstone projects, students meet to discuss their

experiences and to get feedback from each other as their projects develop. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 2050 - Introduction to Business Problem Solving

Focuses on the technology and problem solving skills necessary for students to succeed both at school and in the business world. Focuses on business decision making using spreadsheets, database and web tools. Students solve problems in statistics, accounting, finance, marketing, management and information systems. The objective is to provide problem solving methods necessary for students to succeed in the business community. This is a business core course therefore a grade of a 'C' or better must be earned to satisfy Business graduation and prerequisites for other business courses. Restriction: Restricted to undergraduate students with a sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 2075 - Introduction to Microsoft Access

Introduction to Microsoft Access prepares students to use data bases to analyze data and solve real-life business problems. It challenges students to use critical thinking and analysis to find efficient and effective solutions to real-life business situations. Students will use databases to solve problems in accounting, finance, and information systems. Prereq: Computer Competency. Max hours: 1 Credit. **Semester Hours:** 1 to 1

ISMG 2800 - Designing for the Web

Students examine how the Web is evolving to support a variety of business needs. The course covers the design and usability principals necessary for improving online interactions via traditional websites as well as using technologies promoting collaboration and information sharing (e.g. social networks, blogs, wikis, forms). Topics include: the principles of web page and web site design; hypertext markup language, cascading style sheets, streaming video, online collaboration technologies; client and server scripting; and the process of testing and publishing web sites. Prereq: ISMG 2050 or taken concurrently with ISMG 2050. Restriction: Restricted to undergraduate Business majors at a sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3000 - Technology In Business

Covers the role of information technology in business organizations. It exposes students to innovative and interesting technologies and illustrates how those technologies are changing the way businesses operate. It highlights the importance of IT in organizations, including the relationship between technology & competitiveness, the alignment of business and IT strategy, the development and management of an effective IT infrastructure and the use of IT strategy, the development and management of an effective IT infrastructure and the use of IT-enabled organizational processes. Topics include: coping with information intensity, web sites, social networks and blogs; business intelligence at each level of management; IT based reports and data; collaboration and the impact of technology on organizational interaction; the use of IT for controlling and enhancing business processes; security, privacy & disaster recovery; and emerging technologies. Note: Business core course therefore a grade of a "C" or better must be earned to satisfy graduation requirements. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3100 - Information Technology Hardware and Software

Provides the hardware/software technology background to enable systems development personnel to understand tradeoffs in computer architecture for effective use in business environment. System architecture for single user, central, and networked computing systems; single and multi-user operating systems. Prereq: ISMG 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3200 - Programming, Data, File and Object Structures

Provides an understanding of algorithm development, programming, computer concepts, and the design and application of data and file structures. Includes an understanding of the logical and physical structure of both programs and data. The "JAVA" programming language will be used as the vehicle for investigating a variety of data structure topics. Topics include: data structures and representation; characters, records, files and multimedia; precision of data; information representation, organization and storage; algorithm development; object representation compared to conventional data flow notation; programming control structures; program correctness, verification, and validation; file structures and representation. Prereq: ISMG 2200. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3300 - Social Media in Business

Social media has become a central component of many business activities including marketing, HR, product management and the supply chain. In this course, we examine the organizational use of social media technologies such as blogs and social networks, as well as the use of social media analytics to drive business strategy. Cross-listed with MKTG 3300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3500 - Enterprise Data and Content Management

The success of today's business often hinges on the ability to turn mountains of data into critical information to make right decisions quickly and efficiently. This course introduces students to data, content and multimedia management using current enterprise data management tools. Topics include: Oracle SQL for relational database and for multimedia content; Oracle forms and reports, XML, and content management. Prereq: ISMG 2050 or equivalent, transfer credit VALIDATION (may need ISMG 2075 - 1 credit). Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3600 - System Strategy, Architecture and Design

This course is designed to provide the understanding of current concepts related to information systems development in an organizational context. It emphasizes the interactive nature of the analysis and design process. Topics include: requirements analysis, model based analysis and design; evaluating outsourcing, COTS and other systems acquisition options; and quality, six-sigma, and ethics in design. New concepts such as agile modeling and extreme programming are covered. Prereq: ISMG 2050 or equivalent with a grade of 'C-' or higher and Coreq: ISMG 3500. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 3939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. To enroll in an internship, students must work with the Experiential Learning Center on campus and have a 2.40 GPA or higher. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits.

Semester Hours: 1 to 3

ISMG 4028 - Travel Study Topics

Join your classmates in an international travel study course to understand the business operations of another culture. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits.

Semester Hours: 3 to 3

ISMG 4200 - Building Business Applications

Examines how business technologies are designed and implemented. Usability, logic, and platform selection issues are highlighted through the development of simple business systems. Includes Windows interface design; storing, retrieving, and manipulating information; real time decision making; task automation through iteration; platform selection (mobile, desktop or web); and web programming. Prereq: ISMG 2800. Coreq: ISMG 3500. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4300 - Information Security and Compliance

This course covers information security threats and various mechanisms available to organizations to defend against information compromise. It offers thorough analysis of state, national, and international information security regulations with which businesses must comply, including the Sarbanes-Oxley, Gramm-Leach-Bliley and Hippa Acts. The regulatory compliance analysis will include measures the organizations must and should perform to be in compliance. Coreq: ISMG 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4400 - Web Application Development

Course covers rapid website development using Ruby on Rails. This is an object-oriented platform based on the Ruby programming language which enables website developers to rapidly develop sophisticated websites with high levels of functionality using Ruby language. Prereq: ISMG 4200. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max Hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4500 - Database Management and Applications

The success of today's business often hinges on the ability to turn mountains of data into critical information and to utilize the critical information to make the right decisions quickly and efficiently. This course introduces students to the basic principles of data management and utilization. Topics include data modeling, normalization and database design, query formulation using SQL and QBE and interface design. Actual database management systems products (e.g. Oracle and Access) are utilized to demonstrate the design of database applications in management, marketing, finance, accounting and other business areas. Each student will also design a working database system as a project. Prereq:

ISMG 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4700 - Business Data Communications and Networking

Provides an in-depth knowledge of data communications and networking requirements including: networking and telecommunications technologies, hardware, and software. Emphasis is upon the analysis and design of networking applications in organizations. Management of telecommunications networks, cost-benefit analysis, and evaluation of connectivity options are also covered. Students learn to evaluate, select, and implement different communication options within an organization. Topics include: network hardware and software; network configuration; network applications; distributed versus centralized systems; network architectures, topologies and protocols; network performance analysis; privacy, security, reliability; management of telecommunications, and communications standards. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4750 - Business Intelligence and Financial Modeling

In this course, the student learns to analyze and solve financial problems with spreadsheet models, apply Oracle Financial and Business Intelligence software that is widely used in corporate financial operations and model risk and uncertainty with Monte Carlo software. Prereq: ISMG 2050 with a grade of 'C-' or higher, FNCE 3000 and ISMG 3000 (ACCT 4054 may substitute for ISMG 3000) all with a grade of 'C' or higher. Cross-listed with FNCE 4750. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4760 - Customer Relationship Management

This marketing-theory driven course examines customer relationship management (CRM) as a key strategic process for organizations. Composed of people, technology and processes, effective CRM optimizes the selection or identification, acquisition, growth and retention of desired customers to maximize profit. Besides presenting an overview of the CRM process, its strategic role in the organization and its place in marketing, students have an opportunity to create simulated CRM database using popular software package that help to illustrate what CRM can do, its advantages and limitations. Prereq: MKTG 3000 and ISMG 3000. Cross-listed with MKTG 4760. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4780 - Accounting and Information Systems Processes and Controls

The course is designed to develop knowledge and skills used to understand and evaluate corporate accounting processes and systems. It focuses on financial and information system internal controls and the flow of corporate information through accounting system. A financial system objective and risk assessment approach is used to present concepts and techniques for evaluating the adequacy of system processes and controls. Prereq: Completion of ACCT 2200 and 2220 with a grade of 'C' or better. Strictly enforced. Cross-listed with ACCT 4780, 6510 and ISMG 6510. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4800 - eBusiness Systems Development

Students analyze business problems and develop data-driven eBusiness applications to solve them. Development skills

include presenting and receiving information through a web site, validating entered information and storing entered information in text files or databases. Students develop an understanding of the principles of web page and web site design; standard object models, Hypertext Markup Language, client scripting and server programs for database and file access; testing, software quality assurance; and the process of publishing Web pages. Prereq: ISMG 2200. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4840 - Independent Study

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ISMG 4900 - Project Management and Practice

Covers the factors necessary for successful management of enhancement projects. Both technical and behavioral aspects of project management are discussed. The focus is on management of development for enterprise-level systems. Topics include: managing the system lifecycle; requirements determination, logical design, physical design, testing, implementation; metrics for project management; managing expectations: superiors, users, team members and others related to the project; determining skill requirement and staffing the project; cost-effectiveness analysis; reporting and presentation techniques; effective management of both behavioral and technical aspects of the project; change management. Note: Successful completion of this course meets the educational requirements to sit for both the PMP and CAPM exams. Prereq: Students must be a junior status and have completed either: 1. MGMT 3000, MKTG 3000 and ISMG 3000 OR 2. ISMG 3000, ISMG 3500 and ISMG 3600. Restriction: Restricted to undergraduate students in the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 4950 - Special Topics

Seldom offered. This course varies from offering to offering. Typically, it is a research-oriented course exploring new developments in information systems. Prerequisites vary according to topic. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ISMG 5939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. Max hours: 9 Credits. **Semester Hours:** 1 to 3

ISMG 6020 - .Net Programming Fundamentals

This course is designed to provide a thorough introduction to the .Net programming environment. C# is studied as the target object-oriented programming language. Principles of object-oriented programming are demonstrated using programming constructs taken from the business domain. Students are required to apply this knowledge through a series of C# programming exercises, which includes developing Windows Forms applications for the desktop and mobile platforms. Prereq: Basic knowledge of a programming language such as JAVA, C, or Basic. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6028 - Travel Study Topics

Join your classmates in an international travel study course to understand the business operations of another culture. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 9 Credits. **Semester Hours:** 3 to 3

ISMG 6040 - Business Process Management

Designing effective information systems for business requires an awareness of the organization(s) business processes and how to manage and streamline them. The objectives of the course are for students to understand the importance of business processes; the main types of business processes; and the evolution of business process management; business process outsourcing; business process re-engineering; business process redesign; technology enabled business processes; and automated workflow. An important activity is graphically mapping business processes, which are transformed into an application or set of applications. The organization needs to manage the electronic workflow to monitor that the work gets done and allow changes to the workflow. Case studies of organizations are studied for most topics to enhance understanding. The group projects let students apply their knowledge of the course to a specific organization. By the end of this course students should have an appreciation of the important process-centric issues in business systems design. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6060 - Analysis, Modeling and Design

Provides an understanding and application of systems analysis and design processes. Students are exposed to system development life cycle (SDLC), structured systems analysis and design methods, object-oriented analysis and design methods, prototyping and commercial off-the-shelf package software approaches, and joint and rapid application development. Emphasizes the skills required for system analysts such as analytical, interpersonal, technical, fact-finding, and project management skills. Topics include data, process and object modeling, input-output and user interface design, and systems implementation and support. To provide an opportunity to develop these skills, an information system project is completed by a group of students. Students use a Case tool for their group project. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6071 - Introduction to Health Information Technology

Examines what needs transforming in healthcare to improve value, safety and appropriateness of care, and what the role of IT is in that transformation. It also examines the challenges of cultural change and IT strategy in succeeding with clinical information projects. Differences between installation, implementation, transition and actual transformation are suggested and methods for managing subcultures in healthcare (IT, clinical, administrative) are reviewed. Cross-listed with HLTH 6071. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6072 - Fundamentals of Health Information Technology Management

Provides an introduction to the management of information technology in healthcare. A description of information processing, the origin, content, evolution of healthcare information systems and the methodologies deployed to acquire and manage information requirements are discussed. Cross-listed with HLTH 6072. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6080 - Database Management Systems

The success of today's business often hinges on the ability to utilize critical information to make the right decisions quickly and efficiently. Transforming mountains of data into critical information to improve decision making is a skill every business decision maker must possess. This focus course covers the database design topics with a focus on enabling business decision making. Detailed topics include collecting, capturing, querying and manipulating data (using SQL and QBE) for simple to medium complex business applications. Commercial database products (e.g. ORACLE and ACCESS) are utilized to demonstrate the design of database applications in management, marketing, finance, accounting, and other business areas. Students will be able to design and implement simple to medium complex database applications after successful completion of this course. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6120 - Internet and Mobile Technologies

Communication, knowledge sharing, and information acquisition within and between businesses are critical for long term strategic business success. Technological advancements are radically changing the way business communication and knowledge sharing is performed. This course will briefly examine traditional concepts of wired local area networks for reference purposes, but then will focus on how newer mobile technologies are changing the way business communication and knowledge transfer are conducted. Mobile technologies that will be examined in this course include: WiFi wide area networks, wireless local area networks, cellular telephones, smart phones, and other portable computing devices. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6180 - Information Systems Management and Strategy

The effective use of information technology requires the alignment of competitive strategies, business processes, and IT applications. In this course, we take a top management perspective to the development of policies and plans that maximize the contribution of IT to organizational goals. We begin by examining the systems that support the operational, administrative, and strategic needs of organizations. We then investigate the approaches used to manage the IT function, taking into account legacy and emerging technologies. The vital role of the CIO and project champions are explored. Note: Students cannot receive credit for both ISMG 6180 and BUSN 6610. Cross-listed with BUSN 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6200 - Global Information Systems

Will focus on managing information technology globally and the new organizational and information technology designs that firms are establishing to meet the ever-growing global requirements. The course will cover such issues as

how information is used and how information technology is deployed by multinationals in different countries, the state of information technology and telecommunication industries in countries around the world, how global firms gain strategic benefits from information technology, and how firms manage and use global virtual teams. Prereq: ISMG 6040 or 6120 or BUSN 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6220 - Business Intelligence Systems and Analytics

The course is organized around three types and enablers of business intelligence and analytics (1) Descriptive analytics including data warehousing, business reporting, decision dashboard/ scorecards, visual analytics, (2) Predictive analytics including Web Analytics, Web Mining and Social media Analytics, and (3) Prescriptive analytics including decision analytics, automated decision support and expert systems, and big data analytics. The course concludes with emerging trends and topics in business analytics including geospatial in analytics, location-based and consumer oriented analytical applications, mobile platforms, and cloud-based analytics. Hands-on experience is provided through the use of MicroStrategy, SAS, and CORVID software. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6240 - Website Development Practice and Technologies

Presents a broad coverage of design principles and techniques to develop effective web sites. The course emphasizes: (1) understanding the principles of web page and web site design and the process of publishing web pages, (2) developing client-side scripts for use in web sites, (3) using server-side programs or scripts to develop dynamic web sites using databases, and (4) understanding technologies for managing large web sites including XML schemas, content management systems and web services. Prereq: ISMG 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6280 - Service Oriented Architecture

Explores "Service Oriented Architecture" (SOA), which refers to a design pattern made up of components and interconnections that stress interoperability and location transparency. Covers the latest heterogeneous models for carrying out large scale distributed computing using Web services. The fundamentals of defining, designing, building, testing and rolling-out a SOA system are explored using tools from major Web service vendors. Also, looks at the impact of SOA on software quality, efficiency, performance and flexibility. Prereq: ISMG 6020. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6320 - Innovative Health Information Technologies

Learn how innovative health info technologies shape and redefine healthcare by enhancing medical care through scope and scale effects, providing tech efficiencies in delivery of care, utilizing advance tools for patient Ed and self-care, network-integrated decision support, e-business models & opportunities for e-health. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6420 - Global Enterprise Systems

Examines the evolution of global enterprise systems - from internally focused enterprise resource planning (ERP) client or server systems to externally focused eBusiness. Studies the types of issues managers need to consider in implementing cross-functional integrated enterprise systems. Examines the general nature of global enterprise computing, re-engineering principles and the technical foundations of client or server systems and enterprise information architectures. Students learn about the global enterprise systems marketplace. Topics include the tools and methodology, modules, processes and industry initiatives. Finally, the course looks into the future and predicts enterprise system trends. The objective of the course is to make students aware of the potential and limitations of global enterprise systems. The objective will be reached through case studies, lectures, guest speakers and a group project.

Coreq: ISMG 6180 or BUSN 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6430 - Information Systems Security and Privacy

Designed to develop knowledge and skills for security of information and information systems within organizations. Focuses on concepts and methods associated with planning, designing, implementing, managing, and auditing security at all levels and on all systems platforms, including enterprise systems. This course presents techniques for assessing risk associated with accidental and intentional breaches of security as well as disaster recovery planning. Coreq: ISMG 6180 or BUSN 6610 (6810). Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6450 - IT Project Management

Focuses on how firms successfully manage the adoption of It. Projects and program management principles are the primary focus of this course. Topics covered include approaches to prioritizing projects, estimating cost and time-to-market, build vs. buy decision, planning, monitoring and controlling implementation, measurement, total cost of ownership, effective management of both behavioral and technical aspects of the project and change management. Prereq: ISMG 6180 or BUSN 6610 (6810). Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6460 - Emerging Technologies

Provides an introduction to the expansive array of information technologies that form the infrastructure of a modern business enterprise. Emphasis is placed on learning conceptual technological foundations and understanding the business value of the various technologies. The purpose of the course is to develop the student's ability to discuss recent technological advancements with other It professionals and management. Technology assessment is emphasized. Prereq: ISMG 6180 or BUSN 6610 (6810). Restriction: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Cross-listed with BUSN 6800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6470 - Text Data Analytics and Predictive Modeling

Text Analytics course teaches students how to uncover underlying themes and concepts hidden from a large collection of unstructured text data. Students will learn how to process text data into topical clusters, and classify text data into predefined categories. Students will also learn how to integrate unstructured text data with structured data to develop predictive models such that complex organizational problems can be early detected and solved. Students are required to have a familiarity with basic statistics concepts such as regression, t-test, ANOVA and with basic linear algebra. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6480 - Data Warehouse and Administration

Management of large, complex data warehouses and operational databases involves technical skills and background needed by information systems professionals as well as tactical and strategic issues faced by information technology managers. This course provides conceptual knowledge, practical skills, and policy background for prospective information systems professionals and information technology managers. The course covers business aspects, conceptual background, and product material about management of data warehouses and operational databases. Assignments and projects involve Oracle skills for database administration and tactical or strategic issues faced by information technology management. Prereq: ISMG 6080. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6510 - Accounting and Information Systems Processes and Controls

Designed to develop knowledge and skills used to understand and evaluate corporate accounting processes and systems. Focuses on financial and information system internal controls and the flow of corporate information through an accounting system. A financial system objective and risk assessment approach issued to present concepts and techniques for evaluating the adequacy of system processes and controls. Cross-listed with ACCT 6510, 4780 and ISMG 4780. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6800 - Special Topics

A variety of advanced topics are offered in this course. Past topics include the human-computer interface, software engineering, artificial intelligence, graphical user interface, project management and electronic commerce. Consult the current 'Schedule Planner' for semester offerings. Note: Seldom offered. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 15 Credits. **Semester Hours:** 3 to 3

ISMG 6810 - Business Intelligence in Healthcare

Provides students with an overview of how business intelligence is used in the healthcare industry. Students study the evolution of IT in healthcare including digitization of electronic health records and systems integration. Next the course looks at healthcare transformation and the evolution of business intelligence in general. Using case studies and hands on exercises, students learn about different aspects of business intelligence in various subsets of the healthcare industry. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School,

graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6820 - Business Intelligence and Financial Modeling

This course will introduce students to the application of business intelligence in a corporate finance setting. Financial data intelligence is essential for effective decision making throughout the firm, in finance directly and in other functions supported by the finance department. Strategy setting, budgeting, and new product development are just a few decision areas where finance personnel play an active role. In this course, we learn how to apply Oracle e-Business Suite, a finance and business intelligence software tool that provides modules for financial reporting, analysis, budgeting, and planning. These tools enable finance personnel to access and analyze corporate data in support of critical decision making across the enterprise. Students will also analyze data through the use of financial models built in Microsoft Excel. The development of complex financial models will provide students with valuable hands-on experience with a software tool used widely in finance departments. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6830 - IT Governance and Service Management

Deals with interrelated decisions on clarifying the business role of IT, defining integration and standardization requirements for the IT architecture, shared and enabling services for the IT infrastructure and business need for SaaS, and governance of cloud computing, IT outsourcing, and other IT services. Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 6840 - Independent Study: ISMG

Instructor approval required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ISMG 6950 - Master's Thesis

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 8 Credits. **Semester Hours:** 1 to 8

ISMG 7001 - AI-Based Decision Making

Introduces decision making concepts. It covers a range of approaches, techniques and tools for decision aiding and describes how they can be used to support decision processes. The topics include human decision making, decision support systems, knowledge-based systems, and AI methods that support decision making, like machine learning, Bayesian networks and association rules. Prereq: MS in C.S.E. or I.S. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7002 - Computer Security

A broad overview of computer security, roughly divided into three unequal components: a) the history of codes and ciphers; b) basic cryptographic techniques, for example, symmetric cryptography, authentication techniques, and asymmetric cryptosystems, and: c) applications to current and future computer-related technologies, for example, network security, wireless communication, quantum cryptography, and more. Prereq: CSCI 5451. Cross-listed with CSCI 7002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7200 - Advances In Management Information Systems

Provides an introduction to research methodologies engaged in Management Information System Research, including measurement, sampling, survey research, experiments, quasi-experiments and some qualitative research methods. Prereq: admission into the CSIS Ph.D. program and knowledge of basic statistics. Cross-listed with CSCI 7200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7210 - Topics In Analytical Research In Management Information Systems

Provides a detailed coverage of selected analytical research in information systems. Prereq: Admission to the CSIS Ph.D. program. Cross-listed with CSCI 7210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7211 - Topics In Behavioral and Organizational Research In Management Information Systems

Provides a detailed coverage of selected behavioral and organizational research in information systems. Prereq: admission to the CSIS Ph.D. program. Cross-listed with CSCI 7211. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7220 - Research methods: Design and Analysis

Research methods: Design and Analysis. Topics include: research design, approaches to gathering data; sampling methods; linear multivariate analysis methods emphasizing structural equations models; and a brief survey of other methods such as cluster analysis, multidimensional scaling, methods such as neural nets, CART and/or genetic algorithms. While much of the material is of general interest, the course emphasizes methods and situations to prepare students in the CS/IS Ph.D. program for research in their field(s). The course includes student projects involving the analysis of data using appropriate software, whose results are presented to the class. Prereq: BUSN 6530 (or equivalent) and either Ph.D. student status or permission of instructor. Cross-listed with DSCI 6220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7551 - Parallel and Distributed Systems

Examines a range of topics involving parallel and distributed systems to improve computational performance. Topics include parallel and distributed programming languages, architectures, networks, algorithms and applications. Prereqs: Graduate Standing. Cross-listed with CSCI 7551. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7552 - Advanced Topics in Parallel Processing

Examines the advances of sequential computers for gaining speed and application of these techniques to high-speed supercomputers of today. Programming methodologies of distributed and shared memory multiprocessors, vector processors and systolic arrays are compared. Performance analysis methods for architectures and programs are described. Cross-listed with CSCI 7552. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7574 - Advanced Topics in Operating Systems

Covers the advanced topics in operating systems by examining functionality and performance issues in CPU Scheduling, communications, distributed file systems, distributed operating systems, shared-memory multiprocessors and real-time operating systems. In addition to studying papers, reviews, and presentations, students carry out a semester long team project within the scope of one of the above topics. Prereqs: CSCI 3453 or CSCI 5573. Cross-listed with CSCI 7574. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7582 - Artificial Intelligence

Approaches to design of systems for solving problems usually solved by humans, especially those related to intelligent decision making. Emphasis on various types of knowledge representation. Cross-listed with CSCI 7582. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7654 - Algorithms For Communication Networks

Algorithmic and mathematical underpinnings of communication networks. A taxonomy of data-packet networks depending on modes of communication: Fixed-Interconnection networks, radio networks and multiple-access channel. Algorithms to implement packet routing, broadcasting and conflict resolution. Prereq: CSCI 5451. Cross-listed with CSCI 7654. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7765 - Computer Networks

An in-depth study of active research topics in computer networks. Topics include: Internet protocols, TCP/UDP, congestion and flow control, IP routings, mobile IP, P2P overlay networks, network security, performance, and other current research topics. Prereq: Graduate Standing. Cross-listed with CSCI 7765. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7799 - Topics in Network Computing

Studies the active research topics in network based computing such as Cluster, Grid computing, P2P Computing, Pervasive Computing. Workflow system and Cloud Computing. Students will study key papers in the literature, and submit a research term project. Prereq: Graduate Standing. Cross-listed with CSCI 7799. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7800 - Special Topics

A variety of advanced topics are offered at the Ph.D. level in this course. Consult the current 'Schedule Planner' for semester offering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

ISMG 7840 - Independent Study: Pre-Dissertation Research

Conduct pre-dissertation research under the supervision of a faculty member. Prereq: BUSN 6530. Max hours: 18 Credits. **Semester Hours:** 1 to 9

ISMG 8990 - Dissertation Development

Supports development of a dissertation in conjunction with a student's advisor. Prereq: Completion of first year and second year papers (ISMG 7840). Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering and Applied Sciences, PHCS PhD majors and PhD majors. Max hours: 15 Credits. **Semester Hours:** 1 to 15

IWKS 2100 - Human-Centered Design, Innovation and Prototyping

Introduces techniques for collaborative design by interdisciplinary teams: design thinking, problem solving, and rapid prototyping. Teams of students design and implement increasingly complex projects while acquiring essential innovation and problem-solving skills. The course will culminate in a final project chosen by each team. Max hours: 4 Credits. **Semester Hours:** 4 to 4

IWKS 2200 - Technology and Society

Explores the personal, societal and global impact of technology on human social systems, including healthcare, education, finance, and government. Topics include: digital identity; digital media; online electronic entertainment; security, surveillance and privacy; technology and the law; and social media and networking. Max hours 3 Credits. **Semester Hours:** 3 to 3

IWKS 2300 - Digital Creation of Virtual Artifacts

Introduces the fundamental principles of computer science necessary to create realistic virtual artifacts, and to imbue those artifacts with interesting behavior. Completion of this course will prepare students for more advanced IWKS courses that require programming expertise. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 3100 - Introduction to 3D Design

Introduces the visualization, design and creation of three dimensional objects using both additive (e.g., 3D printing) and subtractive (e.g., laser cutting and CNC milling) processes. Various software tools for 3D design will be explored. Students will create several artifacts of interest, culminating in a final project. Expected background: IWKS 2100 & IWKS 2300 (students who have not taken these courses should consult the instructor). Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 3200 - Data Science for Human-Centered Design

Introduces techniques for the extraction, analysis and visualization of information sourced from available qualitative

and quantitative digital data. Approaches for selecting, evaluating, integrating and synthesizing information into purposeful knowledge to enhance comprehension and analysis, and to support policy and decision processes. Expected background: IWKS 2200 & IWKS 2300 (students who have not taken these courses should consult the instructor). Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 3300 - NAND to Tetris

Introduces the principles and technologies that underlie the global information age. Starting from first principles, students gradually construct a simple hardware platform and a modern software hierarchy, yielding a working basic yet powerful computer system. Only introductory programming experience is required. Expected background: IWKS 2300 (students who have not taken this course should consult the instructor). Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 3400 - Game Design and Development I

Introduces fundamental principles of computer game development, building on the rich interplay of computer science, graphics design, physics, music, and narrative. Students develop interactive 2D and simple 3D games and a final project. Substantial software development involved, but requires only introductory programming experience. Expected background: IWKS 2300 (students who have not taken these courses should consult the instructor). Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 3600 - Introduction to Development and Global Health

Introduces international development and global public health. Examines the theories, policies, institutions and critiques that have shaped the field. Using case studies, explores practical approaches for the identification, design, planning, monitoring, and evaluation of global health interventions in their broader development context. Expected background: IWKS 2200 (students who have not taken these courses should consult the instructor). Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4100 - Advanced Human-Centered Design

Explores design thinking and the user-centered design paradigm from a broad perspective, emphasizing how user research and prototype assessment can be integrated into different phases of the design process. Teams of students develop expertise in the design, development, and critique of solutions to important human problems. Cross-listed with IWKS 5100. Expected background: IWKS 2100 & IWKS 3100 (students who have not taken these courses should consult the instructor). Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4120 - Physical Computing and Autonomous Artifacts

Introduces techniques for designing hardware and software-enabled artifacts that sense and respond to humans in meaningful ways. Such artifacts range from interactive art to wearable health monitors to game playing robots. Explores the design and implementation of interactive systems and environments that include such artifacts. Expected knowledge: IWKS 2100 & IWKS 2300 (students who have not taken these courses should consult the instructor). Cross-listed with IWKS 5120. Max hours: 4 Credits. **Semester Hours:** 4 to 4

IWKS 4400 - Game Design and Development II

Continuation of IWKS 3400, with increased emphasis on more advanced techniques including 3D rendering; lighting simulation; vertex, pixel and geometry shaders; shadows; terrain building; bump, parallax, and parallax occlusion mapping; Phong and Gouraud shading; cel shading; ray tracing; bloom; and high dynamic range lighting. Expected background: IWKS 3400 (students who have not taken this course should consult with the instructor). Cross-listed with IWKS 5400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4500 - Molecular Biology for Computer Scientists & Engineers

Provides a serious introduction to the core elements of molecular biology using in-class lectures and hands-on labs that assumes a quantitative rather than biological background. Motivated student teams can use this course to prepare and receive mentorship for the summer iGEM competition. Expected background: IWKS 3300 and an understanding of basic biology and chemistry (students who have not taken these courses should consult the instructor). Cross-listed with IWKS 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4520 - Design for Healthful Human Longevity

Introduces contemporary studies, therapies, theories, and research on aging, age related disease, and innovations for longer healthier human lives. Guest lecturers, seminar discussions, readings and discussions will inform student projects that address challenges to prolonged, healthy, disease-free lives. Expected background: IWKS 2100 & IWKS 2200 (students who have not taken these courses should consult the instructor). Cross-listed with IWKS 5520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4600 - ICTD and Global Health

Applies theory and best practices from the field of Information and Communication Technology for Development (ICTD) to the challenge of improving healthcare in the developing world. Examines relevant history, theory, critical and other interdisciplinary perspectives. Provides a foundation for further study and practice in ICTD. Expected background: IWKS 2100 & IWKS 3600 (students who have not taken these courses should consult the instructor). Cross-listed with IWKS 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4620 - Design for Extreme Affordability

Designing products and services that can be sustainably employed by the world's poorest citizens. Students in interdisciplinary teams design, implement and evaluate solutions to real problems facing people and communities living in extreme poverty. How to create designs that respond appropriately to these unique circumstances. Expected background: IWKS 2100 & IWKS 3600 (students who have not taken this course should consult the instructor). Cross-listed with IWKS 5620. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4680 - Case Studies in Design

Explores why some projects succeed and others fail. Many human-centered interventions fail to meet their designers' objectives, reflecting the unique challenges associated with matching human need with feasibility. Explores how innovators can increase their chances for success by examining several successful (and unsuccessful) designs. Expected background: IWKS 2100 & IWKS 2200 (students who have not taken this course should consult the instructor). Cross-listed with IWKS 5680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4700 - Designing Digital Pedagogy

Explores how design thinking and user-centered design can be used to develop and improve technology-mediated learning. Using a team-based project-oriented approach, students design, develop, and evaluate new modalities for digital education. Expected background: IWKS 2100, IWKS 2200 & IWKS 2300 (students who have not taken this course should consult the instructor). Cross-listed with IWKS 5700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 4800 - StartUp: So You Want to be an Entrepreneur?

Teams of students create and launch a company in a semester. Culminates in a "pitchfest" to area entrepreneurs and venture capitalists. One of two alternative capstone courses for the Inworks Minor in Design and Innovation. Expected background: IWKS 2100, IWKS 2200 & IWKS 3200 (students who have not taken these courses should consult the instructor). Cross-listed with IWKS 5800. Max hours: 4 Credits. **Semester Hours:** 4 to 4

IWKS 4900 - Undergraduate Capstone

Working closely with project sponsors, students design, implement, and evaluate a project for use in local industry and non-profit organizations. One of two alternative capstone courses for the Inworks Minor in Design and Innovation. Expected background: IWKS 2100, IWKS 2200 & IWKS 3200 (students who have not taken these courses should consult the instructor). Max hours: 4 Credits. **Semester Hours:** 4 to 4

IWKS 4930 - Special Topics

Emergent issues and professional developments in design, innovation and prototyping. Consult the current Inworks Course List for semester offerings as new special topics courses are frequently added. Prerequisite requirements vary according to topics and instructor requirements. Max hours: 8 Credits. **Semester Hours:** 1 to 4

IWKS 4970 - Independent Study

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to design, innovation and prototyping. With permission, may be repeated for credit. Max hours: 8 Credits. **Semester Hours:** 1 to 4

IWKS 5100 - Advanced Human-Centered Design

Graduate version of IWKS 4100. Explores design thinking and the user-centered design paradigm from a broad perspective, emphasizing how user research and prototype assessment can be integrated into different phases of the design process. Teams of students design, develop, and critique solutions to important human problems. Expected background: IWKS 2100 & IWKS 3100 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5120 - Physical Computing and Autonomous Artifacts

Graduate version of IWKS 4120. Introduces techniques for designing hardware and software-enabled artifacts that sense and respond to humans, ranging from interactive art to wearable health monitors to game playing robots. Explores the design and implementation of interactive systems and environments that include such artifacts. Expected background: IWKS 2100 & IWKS 2300 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4120. Max hours: 4 Credits. **Semester Hours:** 4 to 4

IWKS 5400 - Game Design and Development II

Continuation of IWKS 3400, with increased emphasis on more advanced techniques including 3D rendering; lighting simulation; vertex, pixel and geometry shaders; shadows; terrain building; bump, parallax, and parallax occlusion mapping; Phong and Gouraud shading; cel shading; ray tracing; bloom; and high dynamic range lighting. Expected background: IWKS 3400 (students who have not taken this course should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5500 - Molecular Biology for Computer Scientists & Engineers

Graduate version of IWKS 4500. Provides a serious introduction to the core elements of molecular biology using in-class lectures and hands-on labs that assumes a quantitative rather than biological background. Motivated student teams can also use this course to prepare and receive mentorship for the summer iGEM competition. Expected background: IWKS 3300 (students who have not taken this course should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5520 - Design for Healthful Human Longevity

Graduate version of IWKS 4520. Introduces contemporary studies, therapies, theories, and research on aging, age related disease, and innovations for longer healthier human lives. Guest lecturers, seminar discussions, readings and discussions will inform student projects that address challenges to prolonged, healthy, disease-free lives. Expected background: IWKS 2100 & IWKS 2200 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5600 - ICTD and Global Health

Graduate version of IWKS 4600. Applies theory and best practices from the field of Information and Communication Technology for Development (ICTD) to improve healthcare in the developing world. Examines relevant history, theory, critical and other interdisciplinary perspectives. Provides foundation for further study and practice in ICTD. Expected background: IWKS 2100 & IWKS 3600 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5620 - Design for Extreme Affordability

Graduate version of IWKS 4600. Designing products and services that can be sustainably employed by the world's poorest citizens. Interdisciplinary teams design, implement and evaluate solutions to real problems facing people living

in extreme poverty. How to create designs that respond appropriately to these unique circumstances. Expected background: IWKS 2100 & IWKS 3600 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5680 - Case Studies in Design

Graduate version of IWKS 4680. Explores why some projects succeed and others fail, and the unique challenges associated with matching human need with feasibility. Explores how innovators can increase their chances for success by examining several successful (and unsuccessful) designs. Expected background: IWKS 2100 & IWKS 2200 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5700 - Designing Digital Pedagogy

Graduate version of IWKS 4700. Explores how design thinking and user-centered design can be used to develop and improve technology-mediated learning. Using a team-based project-oriented approach, students design, develop, and evaluate new modalities for digital education. Restriction: Expected background: IWKS 2100, IWKS 2200 & IWKS 2300 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4700. **Semester Hours:** 3 to 3

IWKS 5800 - StartUp: So You Want to be an Entrepreneur?

Graduate version of IWKS 4800. Teams of students create and launch a company in a semester. Culminates in a "pitchfest" to area entrepreneurs and venture capitalists. Expected background: IWKS 2100, IWKS 2200 & IWKS 3200 (students who have not taken these courses should consult the instructor). Restriction: Restricted to students with graduate standing. Cross-listed with IWKS 4800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

IWKS 5930 - Special Topics

Emergent issues and professional developments in design, innovation and prototyping. Consult the current Inworks Course List for semester offerings as new special topics courses are frequently added. Prerequisite requirements vary according to topics and instructor requirements. Restriction: Restricted to students with graduate standing. Max hours: 8 Credits. **Semester Hours:** 1 to 4

IWKS 5970 - Independent Study

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to design, innovation and prototyping. With permission, may be repeated for credit. Max hours: 8 Credits. **Semester Hours:** 1 to 4

LATN 1010 - Elementary Latin I

Introduces grammar, syntax, and vocabulary of Classical Latin, with an emphasis on preparing students to read Latin

while improving English grammar and vocabulary skills. Two semesters of Latin may be used to fulfill the CLAS language competency requirement. Max hours: 5 Credits. **Semester Hours:** 5 to 5

LATN 1020 - Beginning Latin II

Completes the presentation of basic Latin grammar, syntax and vocabulary. Introduces students to Latin literature through readings in select authors adapted to meet the needs of beginning students. Note: This course assumes that students have passed LATN 1010 or equivalent, or have taken one year of high school Latin, or possess equivalent proficiency. A grade of C- or higher in LATN 1010 is recommended for success in this course. Max hours: 5 Credits. **Semester Hours:** 5 to 5

LATN 1050 - Vocabulary for Professionals

Studies English words derived from Latin and Greek by analyzing their component parts (prefixes, stems, and suffixes). Cross-listed with ENGL 1050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LATN 1100 - Building Vocabulary From Greek and Latin Words

Students learn to decipher unfamiliar words by breaking them down to their Latin or Greek roots. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LATN 2010 - Intermediate Latin I

Introduces advanced Latin grammar, vocabulary, syntax, and stylistics of Latin prose via readings in Caesar, Cicero and Livy. Includes review of basic Latin grammar, plus introduction to Latin prose composition and Latin rhetoric. Emphasis on historical, cultural, social context of authors and works. Note: This course assumes that students have passed LATN 1020 or equivalent, or have taken two years of high school Latin, or possess equivalent proficiency. A grade of C- or higher in LATN 1020 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LATN 2020 - Intermediate Latin II

(Continuation of LATN 2010.) Completes the presentation of advanced Latin grammar, vocabulary, syntax, and stylistics of Latin prose. Continues the study of Latin prose composition and Latin rhetoric with emphasis on historical, cultural, and social context of authors and works. Note: This course assumes that students have passed LATN 2010 or equivalent, or have taken three years of high school Latin, or possess equivalent proficiency. A grade of C- or higher in LATN 2010 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LATN 2840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

LATN 3000 - Medical Terminology

The course enables students to understand medical terms by learning the Greek and Latin word elements that form these terms. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LATN 3840 - Independent Study

Max hours: 12 Credits. **Semester Hours:** 1 to 3

LATN 4840 - Independent Study

Max hours: 12 Credits. **Semester Hours:** 1 to 3

LATN 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

LATN 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

LCRT 2000 - Children's & Adolescent Literature in the 21st Century

This course explores both classic and contemporary children's and adolescent literature and media in traditional and digital texts, specifically focusing on developing literary understandings, exploring perspectives and personal responses to literature, and inquiring into trends and issues. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 3601 - Into to Landscape Arch: Engaging Designed Landscape

This course is an overview of the historical development, social context and contemporary practice of landscape architecture, which has existed as a profession for over 120 years and has been practiced in one form or another for millennia. Restriction: Restricted to undergrads with sophomore standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5500 - Introductory Landscape Architecture Design Studio

Introduction to basic strategies, methods and techniques of landscape architectural design and representational techniques. Explores fundamental issues of spatial form and landscape experience and meaning. Coreq: LDAR 5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5501 - Landscape Architecture Design Studio 1

Introduction to basic strategies, methods and techniques of landscape architectural design and representational techniques. Explores fundamental issues of spatial form and landscape experience and meaning. Max hours: 6 Credits. **Semester Hours:** 6 to 6

LDAR 5502 - Landscape Architecture Design Studio 2

Problem-based studio course covers strategies, methods and techniques of landscape architectural design with emphasis in more complex social and urban issues, design processes and development and the application of theory and research. Prereq: LDAR 5501 or permission of department chair. Max hours: 6 Credits. **Semester Hours:** 6 to 6

LDAR 5503 - Landscape Architecture Design Studio 3

Problem-based studio covering the approaches, techniques and means for planning and designing sites to accommodate development program on a particular site within an identifiable context. Covers issues definition, site analysis, programming, development of design strategies, evaluation site planning, and communication. Prereq: LDAR 5501 and LDAR 5502 or permission of department chair. Max hours: 6 Credits. **Semester Hours:** 6 to 6

LDAR 5510 - Graphic Media in Landscape Architecture

Introduces basic principles and methods associated with analog and digital drawing-plan, sections, perspectives, color, shading, composition and projection. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5521 - History of Landscape Architecture

Intro survey course fosters workable understanding of landscape architecture design history and theory and offers a base for understanding trends and ideas influencing contemporary practice. Emphasizes Western Europe and the United States from Egyptian antiquity to early twentieth century. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5532 - Landform Manipulation

Focuses on the fundamental technical aspects of landscape architectural design and site engineering of related topography, grading, drainage design, landform manipulation, earthwork calculations, and road alignment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5540 - Introduction to GIS

An introduction to GIS as a set of strategies, methods and techniques used to facilitate the inventory and analysis of complex systems. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5572 - Landscape Ecology

Course emphasizes continuity and change in an ecology of the natural and man-made landscape. Focuses on biological, geophysical, cultural, and perceptual factors involved in landscape, spatial organization, and urban and regional structure. Introduces field ecology for landscape architecture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 5573 - Advanced Landscape Ecology

Critically investigates the performance of complex landscape systems on multiple spatial and temporal scales, with emphasis on the interaction of human and non-human systems. May address issues of sustainability, disaster recovery, mitigation, etc. Prereq: LDAR 5572 or URPL 6500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6470 - ACE Mentoring

Graduate students work with professional architects, designers, and engineers mentoring students in selected local high schools to learn problem solving, graphics and model making to produce a design project. Student mentors develop lesson plans, outcomes and keep a weekly journal. Cross-listed with ARCH 6470 and URPL 6850. Restriction: Restricted to majors within the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6520 - Landscape Architecture in Other Cultures

Study abroad. Various studies of landscape architecture, architecture, urbanism, and design in foreign countries. Max hours: 9 Credits. **Semester Hours:** 1 to 9

LDAR 6604 - Landscape Architecture Design Studio 4

Intermediate landscape design studios engage design projects and topics that cover diverse design approaches, contexts, and landscape processes at various scales and complexities. Design projects will vary. Students are expected to expand their graphic, oral communication, and design skills.. Prereq: LDAR 5501, 5502, 5503 or permission of department chair. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6605 - Landscape Architecture Design Studio 5

Intermediate landscape design studios engage design projects and topics that cover diverse design approaches, contexts, and landscape processes at various scales and complexities. Design projects will vary. Students are expected to expand their graphic, oral communication, and design skills. Prereq: LDAR 5501, 5502, 5503, 6604 or permission of department chair. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6606 - Landscape Architecture Design Studio 6

Advanced landscape architecture design studio covering situations of urbanization and change at various scales and complexities. Prereq: LDAR 5501, 5502, 5503, 6604, 6605 or permission of department chair. Max hours: 6 Credits. **Semester Hours:** 6 to 6

LDAR 6607 - Landscape Architecture Design Studio 7

Advanced landscape design studios engage design projects and topics that cover diverse design approaches, contexts, and landscape processes at various scales and complexities. Design projects will vary. Students are expected to demonstrate mastery of graphic, oral communication, and design skills. Prereq: LDAR 5501, 5502, 5503, 6604, 6605, 6606 or permission of department chair. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6608 - Landscape Architecture Design Studio 8

Advanced landscape design studios engage design projects and topics that cover diverse design approaches, contexts, and landscape processes at various scales and complexities. Design projects will vary. Students are expected to demonstrate mastery of graphic, oral communication, and design skills. Prereq: LDAR 5501, 5502, 5503, 6604, 6605, 6606, 6607 or permission of department chair. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6620 - Landscape Architecture Theory and Criticism

Explores and assesses theory in landscape architecture and the concepts, ideas and discourses underlying contemporary design approaches. Emphasizes developing critical understanding of the roles and agency of theoretical inquiries in landscape architecture in relation to aligned disciplines. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6624 - The Built Environment in Other Cultures I: Research Design

Intends to broaden students' perspectives by asking them to examine design within another culture. Students prepare a proposal of study including a statement of the problem to be addressed, the type of field research to be undertaken, and the nature of the report to be produced. Cross-listed with ARCH 6715. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6625 - Landscape Architecture Field Studies

Critical field evaluation of built works of landscape architecture using methodological approaches like field measurement, mapping, sketches, photography, written evaluations and applied research. It may also assess the performative aspects of designed landscapes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6630 - Site, Society and Environment

Sites are defined by relationships within environmental and social settings. Therefore site design should be primarily ethical and secondarily technical. This course examines the implications of this idea through site methodologies, conceptual construction of site, site analysis and site typologies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6631 - Landscape Construction Materials and Methods

Develops understanding of detailed design processes, construction materials and selection of construction methods and documents. Typically taken with LDAR 6605 and 6606 (LDAR Design Studios 5 and 6). Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6632 - Site Planning

Focuses on site planning processes, criteria and decision-making. Includes research, site analysis, and data synthesis as they relate to site context and design concepts. Also addresses site work (grading and drainage, utilities), cost computation, and creating site and building program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6641 - Computer Applications in Landscape Architecture

Introduces digital technologies and methods commonly used in landscape architecture including primarily CADD, visualization, graphic design, and other emerging applications. Includes hands-on exercises. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6642 - Landscape Architecture Digital Design Workshop

Provides hands-on experiences in the principles, software, and theories for emergent 3-D and 4-D design in landscape architectural practice and research. Prereq: LDAR 6641. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6670 - Plants in Design

Explores the challenges, opportunities and responsibilities of designing with living, growing, and ever-changing organisms. Students learn to identify plants that are commonly used in the Colorado region and the principles, theories, methods, and techniques for planting design. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6671 - Plant Material Identification

Students learn the names, characteristics and site requirements of plants including trees, shrubs, ground covers and perennials commonly used in built works in the Colorado region. Methods are transferable to other regions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6686 - Special Topics: Landscape Architecture

Various topical concerns are offered in landscape architecture history, theory, elements, concepts, methods, implementation strategies, and other related areas. Max hours: 21 Credits. **Semester Hours:** 3 to 3

LDAR 6710 - Landscape Representation

Focuses on developing critical understanding of various advanced manual and digital representation and visualization techniques in landscape analysis and design. Provides frameworks to identify the most appropriate techniques depending on content, context and audience. Prereq: LDAR 5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6711 - Advanced Graphics Landscape Architectural

Focuses on developing practical and applied expertise in various manual and digital visualization and representation

techniques and media used for enhanced effectiveness in visual communication. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6712 - Green Roofs/Living Systems

The primary objective for this seminar is to give students a general understanding of green roof systems, vegetated roofs above underground architecture and vertical vegetated systems. The seminar will engage in critiques and discussions using international, national and local case studies, covering history, typologies, function, design, master planning and costs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6720 - Finding Common Ground

Focuses on principles and societal variables that influence the structure of urban neighborhood space through research application. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6722 - Contested Terrains

Explores the different processes, factors and forces that determine and influence occupation, land use and built form through the phenomena of conflict and contestation. Design is inherently located within the disputes and discourses involving landscape as location and resource. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6723 - Cinema and the Landscape

Explores the relationships between landscape and film through theoretical and practical investigations. Explores film's roles in understanding and investigating landscapes, their dynamic qualities and processes, and issues related to film's capacity to construct spatial meaning. Max hours: 6 Credits. **Semester Hours:** 3 to 3

LDAR 6724 - American Landscapes

Historical, theoretical and critical evaluation of the development of American landscapes. May cover the economic, philosophical and social trends behind changes in the landscape as well as the intellectual and contextual changes to the theory and practice of landscape architecture. Prereq: LDAR 5521 Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6725 - Design Communications

In this seminar students will learn research and writing skills to produce articles in clear, readable, and substantial prose, from academic criticism to general interest reviews; writing forms and styles, including essays, reports, award applications and writing for oral presentation; and editing basics. Prereq: History and/or theory of landscape architecture or architecture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6730 - International Studies Preparation

The course will prepare students to go to China, for 10-day International Summer School, 5-week China Summer

Urban Design Joint Studio, 9-month Gensler Internship, and 1-year LA Dual Degree program. Topics include historic, geographic and cultural issues, and language lessons. Cross-listed with ARCH 6730, URBN 6730, and URPL 6730. Max hours: 3 Credits. **Semester Hours:** 1 to 3

LDAR 6735 - The Landscape of Food

An examination of the reciprocal relationships between landscapes and patterns of food production, distribution, and consumption. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6750 - Professional Practice

Explores the essential elements of professional practice and equips students with the fundamental knowledge and skills requisite to understand and participate in this practice. Covers office organization, project management, contracts, professional ethics and non-traditional careers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6755 - Urban Housing

This course examines housing trends and patterns; supply and demand factors; housing policies; housing challenges (e.g., inequitable distribution, special needs, segregation/discrimination, and homelessness); sociological, demographic, and economic considerations; and the roles of planners and the public and private sectors. Cross-listed with ARCH 6205 and URPL 6405. Restriction: Restricted to majors within the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6840 - Independent Study

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to landscape architecture or urban design. Prereq: Permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 3

LDAR 6910 - Teaching Assistantship

Work with a faculty member in a course to assist with course preparation and delivery and learn teaching practices. Max hours: 9 Credits. **Semester Hours:** 3 to 3

LDAR 6930 - Landscape Architecture Internship

This experiential learning course provides students the opportunity to participate in and reflect on the practice of landscape architecture by working in a design office. Students will reflect on and critically analyze issues such as leadership, management and collaboration. Prerequisite: This course may only be taken once during a student's academic career and is to be taken after the first year of graduate study. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6949 - Research Tools & Methods

Introduces students to research in landscape architecture and related fields and disciplines. Provides students with research practices, methods, and methodologies and a critical framework to identify suitable approaches based on diverse projects and contexts. Supports studio, independent study and thesis. Cross-listed with ARCH 6473. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6950 - Thesis Research

Student works closely with a landscape architecture faculty advisor and thesis committee to develop the thesis through focused research. Research might entail both written and graphic inquiry leading to specific products with conclusive ideas setting the stage for final thesis. Prereq: LDAR 6949 and permission of department chair. Max hours: 3 Credits. **Semester Hours:** 3 to 3

LDAR 6951 - Landscape Architecture Thesis

The Landscape Architecture thesis is expected to advance the field of landscape architecture by offering new insights into aspects of design, technology, history or professional principles. In this course, the student continues to work independently, but closely with a landscape architecture faculty advisor and thesis committee to complete the thesis. The thesis might take on different final forms (written volume, drawings, maps, digital images), depending on the subject inquiry. For further information on the Landscape Architecture Thesis Track consult the Landscape Architecture Thesis Guidelines. Prereq: LDAR 6949 and 6950. Max hours: 6 Credits. **Semester Hours:** 6 to 6

MARC 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MARC 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MATH 1009 - Computer-Based Algebraic Problem Solving

A laboratory-based problem solving course focused on personal computing applications. Topics include general problem solving techniques, deductive reasoning, elementary probability, computer algebraic software, optimization, graphical analysis, systems of equations, spreadsheets, functions, descriptive statistics, linear programming and elementary programming logic. Prereq: basic high school algebra and some familiarity with Microsoft Windows. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 1010 - Mathematics for the Liberal Arts

Designed to give liberal arts students the skills required to understand and interpret quantitative information that they

encounter in the news and in their studies, and to make quantitatively-based decisions in their lives. Topics include a survey of logic and analysis of arguments, identifying fallacies in reasoning, working with numbers and units, linear and exponential relations and essentials of probability and statistics. The emphasis is on applications with case studies in economics, finance, environmental sciences, health, music and science. Note: This course assumes that students have knowledge equivalent to three years of high school mathematics (two years of algebra). GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1 **Semester Hours:** 3 to 3

MATH 1070 - College Algebra for Business

Covers the same mathematical topics as College Algebra, MATH 1110, but with business applications. Note: Graphics calculator required. Note: Students may not receive credit for this course if they have already received credit for MATH 1110 or MATH 1130. Note: 24 on ACT-Math, 560 on SAT-Math or above average performance in intermediate algebra, algebraic literacy or integrated math are strongly recommended as preparation for this course. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 3 to 3

MATH 1080 - Calculus for Social Sciences and Business

A one-semester course in single-variable calculus. Topics include limits, derivatives, differentiation rules, integration and integration rules. Emphasis is on applications to business and social sciences. Note: No knowledge of trigonometry is required. Those planning to take more than one semester of calculus should take MATH 1401 instead of MATH 1080. MATH 1070 or MATH 1110 with a C- or higher is required for students to register for this course. No co-credit with MATH 1401. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 3 to 3

MATH 1110 - College Algebra

Topics in algebra designed for students who intend to take the calculus sequence. Functions, domains, ranges, graphs, data scatter plots and curve fitting, solving equations and systems of equations, polynomial, rational, exponential and logarithmic functions and other topics. Applications are emphasized. Note: Students may not receive credit for this course if they have already received credit for MATH 1070 or MATH 1130. Note: 24 on ACT-Math, 560 on SAT-Math or above average performance in intermediate algebra, algebraic literacy or integrated math are strongly recommended as preparation for this course. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 3 to 3

MATH 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

MATH 1120 - College Trigonometry

Topics in trigonometry, analytic geometry, and elementary functions designed for students who intend to take the calculus sequence. Angles and trigonometry functions of acute angles, analytic trigonometry, fundamental trigonometric functions and identities including hyperbolic trigonometry, parametric equations, and polar coordinate system. Graphic calculators and/or computer algebra systems are used extensively. Applications are emphasized. Note: This course assumes that students have mathematical knowledge equivalent to MATH 1110 or MATH 1070. Students

with a grade of B- or better in MATH 1110 or MATH 1070 pass the course at a much higher rate. No co-credit with MATH 1130. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 3 to 3

MATH 1130 - Precalculus Mathematics

Condensed treatment of the topics in MATH 1110 and 1120. Note: This course assumes that students have mathematical knowledge equivalent to a grade of C- or better in College Algebra and Trigonometry. No co-credit with MATH 1070, 1110 or 1120. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 4 to 4

MATH 1401 - Calculus I

First course of a three-semester sequence (MATH 1401, 2411, 2421) in calculus. Topics covered include limits, derivatives, applications of derivatives, and the definite integral. Note: No co-credit with MATH 1080. Note: : To be able to register for this course, students must first be entered into the MATH 1401 Student Group. To be eligible, students must demonstrate that they have mathematical knowledge equivalent to MATH 1120 or MATH 1130. Students can demonstrate this proficiency 1) by having an SAT score of 620 or an ACT score of 27, taken within the last three years, or 2) by having completed and transferred in a course that is the exact equivalent of MATH 1401 at a different institution, or 3) by earning a score of 70% or higher on the prerequisite exam administered through the MERC lab. Some preparation is required before this prerequisite exam can be taken; contact the MERC lab or the Mathematics department for more information. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1 **Semester Hours:** 4 to 4

MATH 1840 - Independent Study.

Max hours: 3 Credits. **Semester Hours:** 1 to 3

MATH 2411 - Calculus II

The second of a three-semester sequence (MATH 1401, 2411, 2421) in calculus. Topics covered include exponential, logarithmic, and trigonometric functions, techniques of integration, indeterminate forms, improper integrals and infinite series. Prereq: C- or better in MATH 1401. Note: Students with a grade of B- or better in MATH 1401 pass this course at a much higher rate. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 4 to 4

MATH 2421 - Calculus III

The third of a three-semester sequence in Calculus (MATH 1401, 2411 and 2421). Topics include vectors, vector-valued functions, partial differentiation, differentiation, multiple integration, and vector calculus. Prereq: C- or better in MATH 2411. Note: Students with a grade of B- or better in MATH 2411 pass this course at a much higher rate. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1 **Semester Hours:** 4 to 4

MATH 2511 - Discrete Structures

Covers the fundamentals of discrete mathematics, including: logic, sets, functions, growth of functions, algorithms, matrices, mathematical reasoning, proofs, induction, relations, graphs, trees and combinatorics. There is an emphasis on how discrete mathematics applies to computer science in general, and algorithm analysis in particular. Prereq: CSCI 2421. Cross-listed with CSCI 2511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 2810 - Topics

Topics in mathematics with various subtitles reflecting course content. Prereq: permission of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 3

MATH 2830 - Introductory Statistics

Basic statistical concepts, summarizing data, probability concepts, distributions, confidence intervals, hypothesis testing. Note: This course assumes that students have knowledge equivalent to three years of high school mathematics (two years of algebra), intermediate algebra, or Algebraic Literacy at a Colorado Community College at the start of class. Students who have a grade of B- or better in one of these courses pass at a much higher rate. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-MA1. **Semester Hours:** 3 to 3

MATH 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MATH 3000 - Introduction to Abstract Mathematics

Students learn to prove and critique proofs of theorems by studying elementary topics in abstract mathematics, including logic, sets, functions, equivalence relations and elementary combinatorics. Coreq: MATH 2421 or MATH 3191. Note: This course assumes that students have taken MATH 2411 or equivalent. Students who have a grade of B- or better in MATH 2411 pass at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3040 - Mathematics for Elementary Teachers

Key mathematical concepts for K-6 teachers informed by NCTM & Common Core State Standards, such as place-value number systems, rational, proportional, & algebraic reasoning, geometrical concepts, & statistical/probability ideas. Students' meaningful, enjoyable learning is promoted via problem solving activities. Cross-list with MTED 5400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3191 - Applied Linear Algebra

Topics include systems of equations, Gaussian elimination with partial pivoting, LU--decomposition of matrices, matrix algebra, determinants, vector spaces, linear transformations, eigen values and applications. Note: No co-credit with MATH 3195. Note: This course assumes that students have taken MATH 2411 or equivalent. Students who have a

grade of B- or better in MATH 2411 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3195 - Linear Algebra and Differential Equations

Presents the essential ideas and methods of linear algebra and differential equations, emphasizing the connections between and the applications of both subjects. The course is designed for students in the sciences and engineering. Note: No co-credit with MATH 3200 and MATH 3191. Note: This course assumes that students have taken MATH 2411 or equivalent. Students who have a grade of B- or better in MATH 2411 pass this course at a much higher rate. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MATH 3200 - Elementary Differential Equations

First and second order differential equations, Laplace transforms, systems of equations, with an emphasis on modeling and applications. Coreq: MATH 3191. Note: No co-credit with MATH 3195. Note: This course assumes that students have taken MATH 2411 or an equivalent course. Students who have a grade of B- or better in MATH 2411 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3210 - Higher Geometry I

Studies the foundations of modern geometry by examining axiomatic systems for various geometrics, with an emphasis on non-Euclidean hyperbolic geometry. Prereq: C- or better in MATH 3000. Cross-listed with MCKE 5210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3250 - Problem Solving Tools

Students learn and refine both problem solving techniques and computer programming skills. Examples, exercises, and projects are taken from a wide range of mathematical topics including algebra, calculus, linear algebra and probability. Note: This course will not count toward a graduate degree in applied mathematics. Prereq: MATH 2411. Coreq: either MATH 3191 or MATH 3195. Cross-listed with MATH 5250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3301 - Introduction to Optimization in Operations Research

Introduces a mathematical approach for decision-making in practice based on optimization. Students will learn to model, analyze and solve a variety of problems from deterministic operations using both continuous and discrete mathematical programming algorithms and software. Prereq: MATH 3191 or 3195. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3302 - Simulation in Operations Research

Elementary stochastic processes and standard nondeterministic operations research models solved by simulation: Markov chains, Poisson process, Monte Carlo and discrete-event simulation, queuing theory, and inventory models. Prereq: MATH 3191 and 3800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3440 - Introduction to Symbolic Logic

Covers truth functional and quantificational logic through polyadic first order predicate calculus and theory of identity. Attention is given to such problems in metatheory as proofs of the completeness and consistency of systems of logic. Cross-listed with PHIL 3440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3511 - Mathematics of Chemistry

Multivariate functions, probability and statistics for chemistry, matrices and vectors, mathematics of reaction kinetics and symmetry point groups. Course covers mathematics needed for CHEM 4511 and 4521. Can also be an elective for the mathematics minor. Prereq: MATH 2411, CHEM 2031, CHEM 2061. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MATH 3800 - Probability and Statistics for Engineers

Basic probability theory, discrete and continuous random variables, point and interval estimation, test of hypotheses, and simple linear regression. Note: no co-credit with MATH 4810. Note: This course assumes that students have taken MATH 2411 and have either previously taken MATH 2421 or are taking MATH 2421 the same semester as MATH 3800. Students who have a grade of B- or better in MATH 2411 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MATH 4010 - History of Mathematics

A history of the development of mathematical techniques and ideas from early civilization to the present, including the inter-relationships of mathematics and sciences. Prereq: MATH 2411 with a C- or higher. Coreq: MATH 3000 or 3191. Cross-listed with MATH 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4012 - An Advanced Perspective on Number and Operation

"Advanced study of number and operation, including why the various procedures from arithmetic work and connections to algebraic reasoning. Focuses on using rigorous mathematical reasoning and multiple representations to explain concepts. Note: For undergraduate majors, this course only counts toward the mathematics education option. Note: This course assumes that students have taken MATH 3000 or an equivalent course. Students who have a grade of B- or better in MATH 3000 pass this course at a much higher rate. Cross-listed with MATH 5012. Max hours: 2 Credits. **Semester Hours:** 2 to 2

MATH 4013 - An Inquiry-Based Approach to Geometry

An inquiry-based approach to middle-level and Euclidean geometry. Topics include: polygons and the angle relationships, constructions, Pythagorean theorem and perimeter, area and volume, similarity and congruence, circles. Note: For undergraduate majors, this course only counts toward the mathematics education option. Note: This course assumes that students have taken MATH 3000 or an equivalent course. Students who have a grade of B- or better in MATH 3000 pass this course at a much higher rate. Cross-listed with MATH 5013. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MATH 4014 - Statistical Knowledge for Teaching

A problem-based statistics seminar aimed at secondary teachers. Topics include: the central limit theorem, the law of large numbers, probability, measures of central tendency and variability, sampling distributions, regression, and hypothesis testing. Note: For undergraduate majors, this course only counts toward the mathematics education option. Note: This course assumes that students have taken MATH 3800 or an equivalent course. Students who have a grade of B- or better in MATH 3800 pass this course at a much higher rate. Cross-listed with MATH 5014. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MATH 4015 - Capstone Course for Secondary Teachers

High school mathematics from an advanced perspective: analyses of alternative definitions, extensions and generalizations of familiar theorems; discussions of historical contexts in which concepts arose; applications of mathematics. Note: For undergraduate majors, this course only counts toward the mathematics education option. Prereq: MATH 3210, MATH 4310, MATH 3140 or permission of instructor. Cross-listed with MATH 5015. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4027 - Topics in Mathematics

Special topics in mathematics will be covered; consult 'Schedule Planner' for current topics and prerequisites. Max hours: 12 Credits. **Semester Hours:** 3 to 3

MATH 4110 - Theory of Numbers

Every other year. Topics include divisibility, prime numbers, congruencies, number theoretic functions, quadratic reciprocity, and special diophantine equations, with applications in engineering. Prereq: Grade of C- or better in MATH 3000. Note: Students who have a grade of B- or better in MATH 3000 pass this course at a much higher rate. Cross-listed with MATH 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4140 - Introduction to Modern Algebra

Studies the fundamental algebraic structures used in modern mathematics. Topics include groups, rings, fields and polynomials. Note: This course assumes that students have taken MATH 3000 or equivalent and either MATH 3191 or MATH 3195. Students who have a grade of B- or better in these courses pass at a much higher rate. Cross-listed with MCKE 5140. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4201 - Topology

Metric spaces and topological spaces, compactness, separation properties, and connectedness. Note: This course assumes that students have taken MATH 3000. Students who have a grade of B- or better in MATH 3000 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4220 - Higher Geometry II

Studies affine and projective geometries. Coordinates are introduced in this framework. Planes and higher dimensional spaces are examined. Note: This course assumes that students have taken MATH 3191. Students who have a grade of B- or better in MATH 3191 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4310 - Introduction to Real Analysis I

Calculus of one variable, the real number system, continuity, differentiation, integration theory, sequence and series. Prereq: Prereq: Grade of C- or better in MATH 2421 and 3000. Note: Students who have a grade of B- or better in MATH 2421 and 3000 pass this course at a much higher rate. Cross-listed with MCKE 5310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4320 - Introduction to Real Analysis II

Convergence, uniform convergence; Taylor's theorem; calculus of several variables including continuity, differentiation and integration; Picard's theorem in ordinary differential equations and Fourier series. Note: This course assumes that students have taken MATH 4310 or an equivalent course. Students who have a grade of B- or better in MATH 4310 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4387 - Applied Regression Analysis

Topics include simple and multiple linear regression, model diagnostics and remediation, and model selection. Emphasis is on practical aspects and applications of linear models to the analysis of data in business, engineering and behavioral, biological and physical sciences. Prereq: Grade of C- or better in MATH 3191 and MATH 3800 or 4820. Note: Students who have a grade of B- or better in MATH 3191, an A in MATH 3800 or a B- or better in MATH 4820 pass this course at a much higher rate. Cross-listed with MATH 5387. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4390 - Game Theory

Zero-sum and non-zero-sum games; Nash equilibrium and the principle of indifference; Shapley value and other concepts of fair division; Evolutionary game theory, ESS, and evolutionary population dynamics. Applications in economics, business, and biology. Prereq: MATH 2421, 3191 and 3800/4810. Cross-listed with MATH 5390. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4394 - Experimental Designs

Designs covered will include: completely randomized, complete block, split plot, incomplete block, factorial and fractional factorial designs. Additionally, power and study design for non-experimental studies will be covered. Prereq:

Grade of C- or better in MATH 4387 or 5387. Cross-listed with MATH 5394. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4408 - Applied Graph Theory

Introduces discrete structures and applications of graph theory to computer science, engineering, operations research, social science, and biology. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits, matching and covering problems, shortest route and network flows. Note: This course assumes that students have taken MATH/CSCI 2511 or MATH 3000. Students who have a grade of B- or better in MATH/CSCI 2511 or MATH 3000 pass this course at a much higher rate. Cross-listed with CSCI 4408 and MCKE 5408. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4409 - Applied Combinatorics

Every other year. Major emphasis is on applied combinatorics and combinatorial algorithms, with applications in computer science and operations. Topics include general counting methods, generating functions, recurrence relations, inclusion-exclusion, and block designs. Note: This course assumes that students have taken MATH 3000. Students who have a grade of B- or better in MATH 3000 pass this course at a much higher rate. Cross-listed with MCKE 5409. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4450 - Complex Variables

Infrequent. Topics include complex algebra, Cauchy-Riemann equations, Laurent expansions, theory of residues, complex integration, and introduction to conformal mapping. Note: This course assumes that students have taken MATH 2421 and MATH 3000. Students who have a grade of B- or better in MATH 2421 and MATH 3000 pass this course at a much higher rate. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4650 - Numerical Analysis I

Methods and analysis of techniques used to resolve continuous mathematical problems on the computer. Solution of linear and nonlinear equations, interpolation and integration. Prereq: MATH 2411, 3191 or 3195, and programming experience. Cross-listed with CSCI 4650, 5660, and MATH 5660. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4660 - Numerical Analysis II

Numerical differentiation and integration, numerical solution of ordinary differential equations, and numerical solutions of partial differential equations as time allows. Prereq: MATH 3195 or both 3191 and 3200; MATH or CSCI 4650 or 5660; or programming experience. Cross-listed with MATH 5661, CSCI 4660 and 5661. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4733 - Partial Differential Equations

Infrequent. Initial/Boundary value problems for first-order, wave, heat and Laplace Equations; maximum principles; Fourier Series and applications. Note: This course assumes that students have taken MATH 2421 and MATH 3200, and either have taken MATH 3000 or have experience with partial differential equations in engineering or physics. Students

who have a grade of B- or better in MATH 2421 and MATH 3200 pass this course at a much higher rate. Cross-listed with MATH 5733. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4779 - Math Clinic

The clinic is intended to illustrate the applicability and utility of mathematical concepts. Research problems investigated originate from a variety of sources--industry, government agencies, educational institutions, or nonprofit organizations. Prereq: consult Schedule Planner or instructor. Cross-listed with MATH 5779. Max hours: 99 Credits. **Semester Hours:** 3 to 3

MATH 4791 - Continuous Modeling

Every other year. Surveys mathematical problems that arise in natural sciences and engineering. Topics may include population models, epidemic models, mechanics, heat transfer and diffusion, tomography, pharmaco-kinetics, traffic flow, fractal models, wave phenomena, and natural resource management. Most models discussed are based on differential and integral equations. Emphasis is formulation and validation of models as well as methods of solution. Note: This course assumes that students have taken MATH 3191 and MATH 3200. Students who have a grade of B- or better in MATH 3191 and MATH 3200 pass this course at a much higher rate. Cross-listed with MATH 5791. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4792 - Probabilistic Modeling

Every other year. Markov chains; Poisson processes, continuous time Markov chains, elementary topics in queuing theory, and some mathematical aspects of Monte Carlo simulation, including random variate generation, variance reduction, and output analysis. Note: This course assumes that students have taken MATH 4810 or 5310 and have some programming experience. Students who have a grade of B- or better in MATH 4810 or 5310 pass this course at a much higher rate. Cross-listed with MATH 5792. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4793 - Discrete Math Modeling

Every other year. Focuses on the use of graph theory and combinatorics to solve problems in a wide variety of disciplines. Applications are selected from computer science, communication networks, economics, operations research, and the social, biological and environmental sciences. Note: This course assumes that students have taken MATH 3191 and MATH 4408. Students who have a grade of B- or better in MATH 3191 and MATH 4408 pass this course at a much higher rate. Cross-listed with MATH 5793. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4794 - Optimization Modeling

Every other year. Principles of model formulation and analysis are developed by presenting a wide variety of applications, both for natural phenomena and social systems. Examples of optimization models to represent natural phenomena include principles of least time and energy. Examples in social systems include resource allocation, environmental control and land management. Specific applications vary, but are chosen to cover a wide scope that considers dichotomies, such as discrete vs. continuous, static vs. dynamic, and deterministic vs. stochastic. Some computer modeling language (like GAMS) is taught. Note: This course assumes that students have taken MATH 2421 and MATH 3191. Students who have a grade of B- or better in MATH 2421 and MATH 3191 pass this course at a much higher rate. Cross-listed with MATH 5794. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4810 - Probability

Examines elementary theory of probability, including independence, conditional probability, and Bayes' theorem; random variables, expectations and probability distributions; joint and conditional distributions; functions of random variables; limit theorems, including the central limit theorem. Note: No co-credit with MATH 3800. Note: This course assumes that students have taken MATH 3191 or equivalent and have either previously taken MATH 2421 or are taking MATH 2421 the same semester as MATH 4810. Students who have a grade of B- or better in MATH 3191 pass this course at a much higher rate. Cross-listed with MATH 5310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4820 - Introduction to Mathematical Statistics

Sampling distributions, maximum likelihood and method of moments estimation, properties of estimators, classical methods for confidence intervals and hypothesis testing, simple linear regression. Prereq: Grade of C- or better in MATH 3800 or MATH 4810 (preferred). Note: Students who have a grade of A in MATH 3800 or a B- or better in MATH 4810 pass this course at a much higher rate. Cross-listed with MATH 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4830 - Applied Statistics

Review of estimation, confidence intervals and hypothesis testing; Anova; categorical data analysis; non-parametric tests; linear and logistic regression. Prereq: an introductory course in statistics such as MATH 2830 or permission of instructor. No co-credit with MATH 4387 or 5387 and doesn't count for Math degrees. Cross-listed with MATH 5830. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 4840 - Independent Study

Variable credit depending on the student's needs. Offered for the advanced student who desires to pursue a specific topic in considerable depth. Note: Supervision by a full-time faculty member is necessary, and the dean's office must concur. Students may register for this course more than once with departmental approval. Max hours: 12 Credits. **Semester Hours:** 1 to 3

MATH 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MATH 5010 - History of Mathematics

A history of the development of mathematical techniques and ideas from early civilization to the present, including the inter-relationships of mathematics and sciences. Prereq: MATH 1401. Not open to students who have had MATH 4010. No credit for applied math graduate students. Cross-listed with MATH 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5012 - An Advanced Perspective on Number and Operation

Advanced study of number and operation, including why the various procedures from arithmetic work and connections to algebraic reasoning. Focuses on using rigorous mathematical reasoning and multiple representations to explain concepts. Note: Does not count toward graduate degrees in applied mathematics. Prereq: MATH 3000 or permission of instructor. Cross-listed with MATH 4012. Max hours: 2 Credits. **Semester Hours:** 2 to 2

MATH 5013 - An Inquiry-based Approach to Geometry

An inquiry-based approach to middle-level and Euclidean geometry. Topics include: polygons and the angle relationships, constructions, Pythagorean theorem and perimeter, area and volume, similarity and congruence, circles. Note: Does not count toward a graduate degree in applied mathematics. Prereq: MATH 3000 or permission of instructor. Cross-listed with MATH 4013. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MATH 5014 - Statistical Knowledge for Teaching

A problem-based statistics seminar aimed at secondary teachers. Topics include: the central limit theorem, the law of large numbers, probability, measures of central tendency and variability, sampling distributions, regression, and hypothesis testing. Note: Does not count toward a graduate degree in applied mathematics. Prereq: MATH 3800 or permission of instructor. Cross-listed with MATH 4014. Max hours: 1 Credits. **Semester Hours:** 1 to 1

MATH 5015 - Capstone Course for Secondary Teachers

High school mathematics from an advanced perspective: analyses of alternative definitions, extensions and generalizations of familiar theorems; discussions of historical contexts in which concepts arose; applications of mathematics. Note: Does not count toward a graduate degree in applied mathematics. Prereq: MATH 3210, MATH 4310, MATH 3140 or permission of instructor. Cross-listed with MATH 4015. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5016 - RM-MSMSP Research Experience for Teachers - Math Cohort

The Research Experience for Teachers (RET) program is a five-week research exploration in which twelve RM-MSMSP teachers will raise their level of relevant mathematics understanding by engaging in a "hands on" workshop, transforming what they have learned into new curricular materials that will improve the mathematics abilities of their students and hopefully stimulate them to consider a STEM career. Note: Credit may not apply toward any CLAS degree. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MATH 5017 - Topics in Mathematics for Teachers

Topics vary from semester to semester. Designed for professional mathematics teachers. Note: This course will not count toward a degree in applied mathematics. Prereq: permission of instructor. Max hours: 50 Credits. **Semester Hours:** 0 to 50

MATH 5027 - Topics in Applied Mathematics

Selected topics in mathematical problems arising from various applied fields such as mechanics, electromagnetic theory, economics and biological sciences. Prereq: Graduate standing in Applied Mathematics, or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5070 - Applied Analysis

Metric spaces, uniform convergence, elements of Banach spaces, elements of functions of complex variable. Problem solving and independent proof writing. Review of selected advanced topics in analysis for the PhD preliminary examination. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of two semesters of undergraduate real analysis (e.g., MATH 4310 and MATH 4320). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5110 - Theory of Numbers

Every other year. Topics include divisibility, prime numbers, congruences, number theoretic functions, quadratic reciprocity, and special diophantine equations, with applications in engineering. Prereq: Graduate Standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in mathematical proof (e.g. MATH 3000). Cross-listed with MATH 4110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5135 - Functions of a Complex Variable

Infrequent. The complex plane, infinite series and products, elementary special functions, Cauchy-Riemann equations, conformal mapping, complex integration, Cauchy integral theory, and residue theory. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have mathematical knowledge equivalent to two semesters of undergraduate-level real analysis (e.g. MATH 4310, MATH 4320) or to a semester of graduate-level real analysis (e.g., MATH 5070). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5198 - Mathematics for Bioscientists

Infrequent. Develops mathematical reasoning: introduces linear algebra, discrete structures, graph theory, probability, and differential equations, using applications to molecular biology. Note: No credit for mathematics or engineering students. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have mathematical knowledge equivalent to two semesters of calculus (e.g., MATH 1401, MATH 2411). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5310 - Probability

Examines elementary theory of probability, including independence, conditional probability, and Bayes' theorem; random variables, expectations and probability distributions; joint and conditional distributions; functions of random variables; limit theorems, including the central limit theorem. : Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of differential and integral calculus (e.g., MATH 2411). Cross-listed with MATH 4810. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5320 - Introduction to Mathematical Statistics

Sampling distributions, maximum likelihood and method of moments estimation, properties of estimators, classical methods for confidence intervals and hypothesis testing, simple linear regression. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in probability (e.g., MATH 3800 or 4810). Cross-listed with MATH 4820. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5350 - Mathematical Theory of Interest

Rates of interest, term structure of interest rates, force of interest, yield rate, principal, equation of value, annuity, perpetuity, stocks, bonds, other financial instruments. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in probability (e.g., MATH 4810). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5351 - Actuarial Models

Severity models, frequency models, aggregate models, risk measures, ruin theory, construction and selection of empirical models, credibility, simulation. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate-level courses in probability and statistics (e.g., MATH 4810, MATH 4820). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5387 - Applied Regression Analysis

Topics include simple and multiple linear regression, model diagnostics and remediation, and model selection. Emphasis is on practical aspects and applications of linear models to the analysis of data in business, engineering and behavioral, biological and physical sciences. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in statistics (e.g., MATH 4320). No co-credit with MATH 4830/5830. Cross-listed with MATH 4387. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5390 - Game Theory

Zero-sum and non-zero-sum games; Nash equilibrium and the principle of indifference; Shapley value and other concepts of fair division; Evolutionary game theory, ESS, and evolutionary population dynamics. Applications in economics, business, and biology. Prereq: MATH 2421, 3191 and 3800/4810. Cross-listed with MATH 4390. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5394 - Experimental Designs

Designs covered will include: completely randomized, complete block, split plot, incomplete block, factorial and fractional factorial designs. Additionally, power and study design for non-experimental studies will be covered. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in regression analysis (e.g., MATH 4387). Cross-listed with MATH 4394. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5410 - Modern Cryptology

Every other year. Deals with the mathematics that underlies modern cryptology. Topics include: classical cryptology, public and private key cryptosystems, secret sharing schemes, authentication schemes, linear feedback shift registers, discrete logarithm and elliptic curve-based schemes. Prereq: MATH 3191. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5432 - Computational Graph Theory

Infrequent. Algorithmic techniques in graph theory and other discrete mathematics areas. Typical topics include: branch-bound algorithms, matching, colorings, domination, min-plus algebra, simulated annealing and related heuristics, NP-completeness theory. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in graph theory (e.g., MATH 4408). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5446 - Theory of Automata

Infrequent. Studies the relationships between classes of formal languages (regular, context-free, context-sensitive, phrase-structure) and classes of automata (finite-state, pushdown, Turing machines). Additional topics include decidability and computability issues. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in abstract algebra (e.g., MATH 4140). Cross-listed with CSCI 5446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5490 - Network Flows

Every other year. Begins with the classical min-cost flow problem, defined on an ordinary network. Other problems, such as shortest path, are also shown in this class. Both theory and algorithms are presented. Extensions include generalized networks, nonlinear costs, fixed charges, multi-commodity flows and additional applications, such as in communications networks. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5576 - Mathematical Foundations of Artificial Intelligence I

Infrequent. A fundamentals course that complements other approaches, such as in engineering, psychology, and business administration. Here the emphasis is on the mathematical foundations. Topics include logical inference, problem solving, heuristic search, neural nets, analogical reasoning and learning. Models and paradigms also consider different measures of uncertainty. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate course in data structures (e.g., CSCI 2511) and a course in linear algebra (e.g., MATH 3191). Cross-listed with MATH 4576. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5593 - Linear Programming

A linear program is an optimization problem that seeks to minimize or maximize a linear function subject to a system of linear in equalities and equations. This course begins with examples of linear programs and variations in their representations. Basic theoretical foundations covered include polyhedra, convexity, linear inequalities and duality. Two classes of solution algorithms are given: simplex methods and interior point methods. The primary emphasis of

this course is on mathematical foundations, and applications are used to illustrate the main results. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of a course in linear algebra (e.g., MATH 3191). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5610 - Computational Biology

Every other year. Basic introduction and mathematical foundations. Topics include comparative genomics; proteomics; phylogeny; dynamic programming and sequence alignment; gene expression arrays and clustering; Bayesian networks; structure prediction and hidden Markov models. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have some programming experience or the equivalent of a programming course (e.g., CSCI 1410) and linear algebra (e.g., MATH 3191 or 3195). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5660 - Numerical Analysis I

Methods and analysis of techniques used to resolve continuous mathematical problems on the computer. Solution of linear and nonlinear equations, interpolation and integration. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of differential and integral calculus (e.g., MATH 2411) and linear algebra (e.g., MATH 3191 or 3195). Programming experience is strongly recommended. Cross-listed with CSCI 4650, 5660, and MATH 4650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5661 - Numerical Analysis II

Numerical differentiation and integration, numerical solution of ordinary differential equations, and numerical solutions of partial differential equations as time allows. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of linear algebra and differential equations (e.g., MATH 3195 or both MATH 3191 and 3200) and programming experience or a first course on numerical analysis (e.g., MATH 4650). Cross-listed with MATH 4660, CSCI 4660 and 5661. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5674 - Parallel Computing and Architectures

Infrequent. Examines a range of topics involved in using parallel operations to improve computational performance. Parallel architectures, parallel algorithms, parallel programming languages, interconnection networks, and their relation to specific computer architectures. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of a course in numerical analysis (e.g., MATH 4650). Cross-listed with MATH 4674. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5718 - Applied Linear Algebra

Topics include: Vector spaces, practical solution of systems of equations, projections, eigenvalues and eigenvectors, unitary transformations, Schur QR, singular value decompositions, similarity transformations, Jordan forms, and positive definite matrices. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in linear algebra (e.g., MATH 3191). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5733 - Partial Differential Equations

Infrequent. Initial/Boundary value problems for first-order, wave, heat and Laplace Equations; maximum principles; Fourier Series and applications. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate sequence in calculus (e.g., through MATH 2421) and differential equations (e.g., MATH 3200 or 3195). Cross-listed with MATH 4733. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5779 - Math Clinic

The clinic is intended to illustrate the applicability and utility of mathematical concepts. Research problems investigated originate from a variety of sources--industry, government agencies, educational institutions, or nonprofit organizations. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Cross-listed with MATH 4779. Max hours: 99 Credits. **Semester Hours:** 3 to 3

MATH 5791 - Continuous Modeling

Every other year. Surveys mathematical problems that arise in natural sciences and engineering. Topics may include population models, epidemic models, mechanics, heat transfer and diffusion, tomography, pharmaco-kinetics, traffic flow, fractal models, wave phenomena, and natural resource management. Most models discussed are based on differential and integral equations. Emphasis is formulation and validation of models as well as methods of solution. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate-level courses in differential equations and linear algebra (e.g., MATH 3200 and 3191). Cross-listed with MATH 4791. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5792 - Probabilistic Modeling

Every other year. Markov chains; Poisson processes, continuous time Markov chains, elementary topics in queuing theory, and some mathematical aspects of Monte Carlo simulation, including random variate generation, variance reduction, and output analysis. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate-level course in probability (e.g., MATH 4810) and some programming experience. Cross-listed with MATH 4792. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5793 - Discrete Math Modeling

Every other year. Focuses on the use of graph theory and combinatorics to solve problems in a wide variety of disciplines. Applications are selected from computer science, communication networks, economics, operations research, and the social, biological and environmental sciences. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of an undergraduate course in linear algebra (e.g., MATH 3191) and graph theory (e.g., MATH 4408). Cross-listed with MATH 4793. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5794 - Optimization Modeling

Every other year. Principles of model formulation and analysis are developed by presenting a wide variety of applications, both for natural phenomena and social systems. Examples of optimization models to represent natural

phenomena include principles of least time and energy. Examples in social systems include resource allocation, environmental control and land management. Specific applications vary, but are chosen to cover a wide scope that considers dichotomies, such as discrete vs. continuous, static vs. dynamic, and deterministic vs. stochastic. Some computer modeling language (like GAMS) is taught. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. : This course assumes that students have the equivalent of a sequence in calculus (e.g., through MATH 2421) and linear algebra (e.g., MATH 3191). Cross-listed with MATH 4794. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5830 - Applied Statistics

Review of estimation, confidence intervals and hypothesis testing; ANOVA; categorical data analysis; non-parametric tests; linear and logistic regression. Prereq: Graduate standing. Note: This course assumes that students have the equivalent of an introductory course in statistics (e.g., MATH 2830). No co-credit with MATH 4387 or 5387 and doesn't count for Math degrees. Cross-listed with MATH 4830. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 5840 - Independent Study

Available only with approval of graduate advisor. Subjects arranged. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MATH 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MATH 5939 - Internship

Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 6

MATH 5950 - Master's Thesis

Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 8 Credits. **Semester Hours:** 1 to 8

MATH 5960 - Master's Project

Note: Credit hours for this course will not count toward a graduate degree in Applied Mathematics. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 8 Credits. **Semester Hours:** 1 to 8

MATH 6023 - Topics in Discrete Math

Topics may include graph theory, combinatorics, matroid theory, combinatorial matrix theory, finite geometry, design theory, and discrete algorithms. Note: Since topic varies by semester, students may register for this course more than once. Prereq: permission of the instructor. Max hours: 99 Credits. **Semester Hours:** 3 to 3

MATH 6131 - Real Analysis

Every other year. Lebesgue measure and integration, general measure and integration theory, Radon-Nikodym Theorem, Fubini Theorem. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of a two semester course in undergraduate analysis or advanced calculus (e.g. MATH 4310 and 4320) or introductory graduate-level coursework in analysis (e.g. MATH 5070). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6330 - Workshop in Statistical Consulting

Students participate as consultants in a drop-in consulting service operated by the department. Seminars provide students with supervised experience in short term statistical consulting. Note: Since problems vary each semester, students may register for this course more than once. Prereq: Graduate standing. Note: This course assumes that students have the equivalent of graduate-level coursework in regression analysis (e.g. MATH 5387). Max hours: 99 Credits. **Semester Hours:** 3 to 3

MATH 6360 - Exploratory Data Analysis

Every other year. Philosophy and techniques associated with exploratory (vs. confirmatory) data analysis, both as originally presented (John Tukey) and current computer-based implementations. Graphical displays, robust-resistant methods (lines, two-way fits), diagnostic plots, standardization. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have prior coursework in statistics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6376 - Statistical Computing

Computationally-intensive methods in statistics, including random number generation and Monte Carlo methods, data partitioning and re-sampling, numerical and graphical methods, nonparametric function estimation, statistical models and data mining methodology, analysis of large data sets. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have prior coursework in statistics (e.g. MATH 4820 or 4830) and regression analysis (e.g. MATH 4387). Cross-listed with MATH 7376. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6380 - Stochastic Processes

Every other year. Markov processes in discrete and continuous time, renewal theory, martingales, Brownian motion, branching processes, and stationary processes. Applications include queuing theory, performance evaluation of computer and communication systems and finance. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate-level coursework in linear algebra (e.g. MATH 3191) and ordinary differential equations (e.g. MATH 3200), along with undergraduate-level coursework in probability (e.g. MATH 4810). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6384 - Analysis of Dependent Data

Infrequent. Statistical methods for the analysis of data with temporal and/or spatial dependence. Longitudinal data, stationary and non-stationary time series models, geostatistical and lattice spatial models, point processes, hierarchical models. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of advanced undergraduate-level coursework in statistics (e.g. MATH 4820 or 4830) and regression analysis (e.g. MATH 4387). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6388 - Advanced Statistical Methods for Research

Infrequent. The second in a two-semester course in applied statistics. Topics include multifactor analysis of variance and covariance, categorical data, general linear models, bootstrapping, and other computationally intensive statistical methods. : Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in regression analysis (e.g. MATH 5387). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6393 - Introduction to Bayesian Statistics

Prior and posterior distributions, conjugate models, single and multiparameter models, hierarchical models, mixture models, numerical methods for evaluating posteriors, Monte Carlo methods, and Markov chain Monte Carlo. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of advanced undergraduate-level coursework in probability and statistics (e.g. MATH 3800 or MATH 4810 and 4820) and some computer programming experience. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6395 - Multivariate Methods

Every other year. Multivariate distributions, hypothesis testing and estimation. Multivariate analysis of variance, discriminant analysis, multidimensional scaling, factor analysis, principal components. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in regression analysis (e.g. MATH 5387). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6398 - Calculus of Variations and Optimal Control

Infrequent. Standard variational problems (geodesic, time-of-transit, isoperimetric, surface, area), Euler-Lagrange equations, variational principles in mechanics, optimal control problems, necessary conditions for optimality, Pontryagin principle. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of a two semester course in undergraduate analysis or advanced calculus (e.g. MATH 4310 and 4320) or introductory graduate-level coursework in analysis (e.g. MATH 5070). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6404 - Applied Graph Theory

Every other year. Emphasis on graph theory. Topics will include trees, digraphs and networks, intersection graphs, coloring, clique coverings, distance, paths and cycles. Topics are motivated by applications. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6595 - Computational Methods in Nonlinear Programming

Every other year. Introduces fundamental algorithms and theory for nonlinear optimization problems. Topics include Newton, quasi-Newton and conjugate direction methods; line search and trust-region methods; active set, penalty and barrier methods for constrained optimization; convergence analysis and duality theory. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of a two semester course in undergraduate analysis (e.g. MATH 4310 and 4320) and graduate-level coursework in linear algebra (e.g. MATH 5718). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6653 - Introduction to Finite Element Methods

Every other year. The Finite Element Method (FEM) is introduced as a generic tool for the approximation of partial differential equations that model engineering and physics problems of interest. Elliptic, hyperbolic, and parabolic equations are solved with FEM. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in numerical analysis (e.g. MATH 5660). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6735 - Continuum Mechanics

Every other year. Indicical notation. Eulerian and Lagrangian coordinates. Deformation, strain, strain rate, stress. Conservation of mass, momentum, and energy. Exploitation of entropy production inequality to obtain constitutive equations for elastic, viscous, visco elastic, plastic, or porous materials. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate-level coursework in linear algebra (e.g. MATH 3191) and ordinary differential equations (e.g. MATH 3200). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 6840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

MATH 7101 - Topology

Every other year. Topological spaces, compactness, separation properties and connectedness. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of a two semester undergraduate sequence in analysis or advanced calculus (e.g. MATH 4310 and 4320) or a graduate-level course in analysis (e.g. MATH 5070). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7132 - Functional Analysis

Every other year. Linear metric and topological spaces, duality, weak topology, spaces of functions, linear operators, compact operators, elements of spectral theory, and operator calculus. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate level coursework in real analysis (e.g. MATH 6131). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7376 - Statistical Computing

Computationally-intensive methods in statistics, including random number generation and Monte Carlo methods, data partitioning and re-sampling, numerical and graphical methods, nonparametric function estimation, statistical models and data mining methodology, analysis of large data sets. Prereq: MATH 4820/4830 and 4387. Cross-listed with MATH 6376. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7381 - Mathematical Statistics I

Every other year. Mathematical theory of statistics. Parametric inference: discrete and continuous distributions, methods of parameter estimation, confidence intervals. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate-level coursework in linear algebra (e.g. MATH 3191) and statistics (MATH 5320). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7382 - Mathematical Statistics II

Every other year. (Continuation of MATH 7381.) Hypothesis testing, robust estimation, tolerance intervals, nonparametric inference, sequential methods. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of advanced graduate level coursework in mathematical statistics (e.g. MATH 7381). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7384 - Mathematical Probability

Every other year. Measurable spaces, probability measures, random variables, conditional expectations and martingales. Convergence in probability, almost sure convergence, convergence in distribution, limit theorems (law of large numbers, central limit theorem, laws of iterated logarithm). Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate-level coursework in probability (e.g. MATH 4810) and graduate-level coursework in analysis (e.g. MATH 5070 or 6131). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7385 - Stochastic Differential Equations

Brownian motion, Ito integral, Ito formula, Dynkin's formula, stochastic optimal control, boundary value problems, Girsanov theorem, mathematical finance, optimal stopping. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in mathematical probability (e.g. MATH 7384). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7397 - Nonparametric Statistics

Every three years. Statistical inference without strong model assumptions. Hypothesis testing and estimation using permutations and ranks, analysis of variance, and nonparametric model fitting. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7405 - Advanced Graph Theory

Continuation of MATH 6404. Topics to be covered include: trees and optimization, encoding and embedding of graphs, generalized colorings and applications, perfect graphs, extremal problems, substructures, connectedness and cycles. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in graph theory (e.g. MATH 6404). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7409 - Applied Combinatorics

Every other year. Emphasis is on enumerative combinatorics. Topics include multinomial coefficients, generating functions, SDRs, Polya's enumeration theory, pigeon-hole principle, inclusion/exclusion and Moebius inversion of finite posets. Topics may also include introduction to designs and finite geometry. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7410 - Combinatorial Structures

Every other year. Finite combinatorial structures; existence, construction and applications. Topics include Latin squares, Hadamard matrices, block designs, finite geometries and extremal and non-constructive combinatorics. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in combinatorics (e.g. MATH 7409). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7413 - Modern Algebra I

Every other year. Groups, rings and ideals, integral domains. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of undergraduate level coursework in abstract algebra (e.g. MATH 4140). It is recommended that students take MATH 5718 during the same semester as MATH 7413. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7414 - Modern Algebra II

Every other year. Field theory, Galois theory, Modules over rings, especially over integral domains. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in linear algebra (e.g. MATH 5718) and abstract algebra (e.g. MATH 7413). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7419 - Mathematical Coding Theory

Error correcting codes are used to recapture information that has been distorted in some transmission process. Various coding schemes use block codes obtained from algebraic, geometric and combinatorial structures. Topics include: fundamentals, linear, Reed-Muller, Golay, cyclic and BCH codes. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in linear algebra (e.g. MATH 5718). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7421 - Projective Geometry

Every other year. Synthetic and algebraic development of projective spaces. Collineation groups, representation theorems, quadratic sets and applications. Emphasis is on finite projective spaces. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in linear algebra (e.g. MATH 5718) and combinatorics (e.g. MATH 7409). Max hours: 3 Credits.

Semester Hours: 3 to 3

MATH 7593 - Advanced Linear Programming

Every three years. A Ph.D. level course that goes deeper into linear programming, starting from where a graduate-level course (5593) ends. Topics include advanced sensitivity analysis, sparse matrix techniques, and special structures. Additional topics, which vary, include deeper analysis of algorithms, principles of model formulation and solution analysis. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in linear programming (e.g. MATH 5593). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7594 - Integer Programming

Every three years. A Ph.D. level course that uses linear programming (5593), especially polyhedral theory, to introduce concepts of valid inequalities and superadditivity. Early group-theoretic methods by Gomory and Chvatal's rounding function are put into modern context, including their role in algorithm design and analysis. Duality theory and relaxation methods are presented for general foundation and analyzed for particular problem classes. Among the special problems considered are knapsack, covering, partitioning, packing, fix-charge, traveling salesman, generalized assignment matchings. Matroids are introduced and some greedy algorithms are analyzed. Additional topics, which vary, include representability theory, heuristic search and complexity analysis. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in linear programming (e.g. MATH 5593). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7595 - Advanced Nonlinear Programming

Every three years. Focuses primarily on the fundamental theory of nonlinear programming. Topics include convex analysis, optimality criteria, Lagrangian and conjugate duality, stability and sensitivity analysis. Other topics vary depending on the research interests of the instructor. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework addressing computational methods in nonlinear programming (e.g. MATH 6595). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7663 - Finite Difference Methods for Partial Differential Equations

Every other year. Consistency, stability, and convergence for difference schemes. Derivations based on Taylor series and finite series. Methods for parabolic and hyperbolic initial value problems and initial-boundary-value problems, elliptic boundary-value problems, some nonlinear problems. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in numerical analysis (e.g. MATH 5070) and partial differential equations (e.g. MATH 5733). Max hours: 3 Credits.

Semester Hours: 3 to 3

MATH 7665 - Numerical Linear Algebra

Every other year. Solution of linear equations, eigenvector and eigenvalue calculation, matrix error analysis, orthogonal transformation, iterative methods. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in numerical analysis (e.g. MATH 5660) and linear algebra (e.g. MATH 5718). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7667 - Introduction to Approximation Theory

Every other year. Linear normed and Banach spaces, convexity, existence and uniqueness of best approximations, least square approximation and orthogonal polynomials, Chebyshev approximation by polynomials and other related families, splines. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in analysis (e.g. MATH 5070) and linear algebra (e.g. MATH 5718). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 7821 - Topics in Projective Geometry

Infrequent. Advanced topics in projective geometry. Topics may include finite projective planes, free projective planes, derivation, collineation groups, higher dimensional projective spaces, ovals and ovoids. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in projective geometry (e.g. MATH 7821). Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7822 - Topics in Linear Algebra

Infrequent. Topics may include canonical forms, bilinear and quadratic forms, and combinatorial matrix theory. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in linear algebra (e.g. MATH 5718). Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7823 - Topics in Discrete Math

Infrequent. Advanced topics in discrete mathematics; will change from semester to semester. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: Students should contact the course instructor to determine the course focus, and to determine if any prior undergraduate- or graduate-level coursework is assumed. Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7824 - Topics in Computational Mathematics

Infrequent. Topics include methods for differential equations, numerical optimization, approximation theory, inverse problems, and Fourier analysis. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: Students should contact the course instructor to determine the course focus, and to determine if any prior undergraduate- or graduate-level coursework is assumed. Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7825 - Topics in Optimization

Infrequent. Some topics are extensions of those introduced in MATH 6595, while other topics are new. Examples of topics are: duality, stability, sensitivity, consistency, redundancy, principles of optimality, control theory, calculus of various global (non-convex) optimization and model reformulation. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: Students should contact the course instructor to determine the course focus, and to determine if any prior undergraduate- or graduate-level coursework is assumed. Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7826 - Topics in Probability and Statistics

Infrequent. Topics may include generalized linear models, information theory, robust methods, spatial statistics, sequential analysis, Monte Carlo methods, queuing theory. Note: Since topics vary each semester, students may register for this course more than once. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: Students should contact the course instructor to determine the course focus, and to determine if any prior undergraduate- or graduate-level coursework is assumed. Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7827 - Topics in Applied Mathematics

Infrequent. Topics include problems in differential equations, optimization, mathematical modeling, Fourier analysis and approximation theory. Note: Since topics vary each semester, students may register for this course more than once. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Max hours: 48 Credits. **Semester Hours:** 3 to 3

MATH 7840 - Independent Study

Available only to Ph.D. students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

MATH 7921 - Readings in Mathematics

Annual. Seven readings courses are offered regularly primarily for Ph.D. students at the research level in the designated fields. The seminar format requires significant student participation. Prereq: permission of instructor. Max hours: 99 Credits. **Semester Hours:** 1 to 1

MATH 7922 - Rdgs:Math Fndts-Cmptr Sc

Max hours: 99 Credits. **Semester Hours:** 1 to 1

MATH 7923 - Readings: Discrete Mathematics

Max hours: 99 Credits. **Semester Hours:** 1 to 1

MATH 7924 - Rdgs:Comp Mathematics

Max hours: 99 Credits. **Semester Hours:** 1 to 1

MATH 7925 - Readings: Optimization

Max hours: 99 Credits. **Semester Hours:** 1 to 1

MATH 7926 - Rdgs:Applied Prob/Stats

Max hours: 99 Credits. **Semester Hours:** 1 to 1

MATH 7927 - Rdgs:Comp/Math Biology

Max hours: 1 Credits. **Semester Hours:** 1 to 1

MATH 8660 - Mathematical Foundations of Finite Element Methods

Every other year. Theoretical foundations of finite element methods for elliptic boundary value problems, Sobolev spaces, interpolations of Sobolev spaces, variational formulation of elliptic boundary-value problems, basic error, estimates, applications to elasticity, practical aspects of finite element methods. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in finite element methods (e.g. MATH 6653) or equivalent programming experience, and graduate-level coursework in analysis or functional analysis (e.g. MATH 6131 or MATH 7132). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 8664 - Iterative Methods in Numerical Linear Algebra

Every other year. Preconditioned iterative methods for linear systems and eigen problems, conjugate gradients, multigrid and domain decomposition. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have the equivalent of graduate-level coursework in numerical analysis (e.g. MATH 5660) and numerical linear algebra (e.g. MATH 7665). Max hours: 3 Credits. **Semester Hours:** 3 to 3

MATH 8990 - Doctoral Dissertation

Only for students working on their Ph.D. research. Max hours: 50 Credits. **Semester Hours:** 1 to 10

MCKE 3041 - Number and Operation

First of three courses designed for prospective elementary teachers. Emphasis placed on the real number system and arithmetic operations. Explorations focus on place value, additive and multiplicative reasoning, the division algorithm and rational numbers. Content presented using problem solving and exploration. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 3042 - Algebra, Probability and Data Analysis

Second of three courses designed for prospective elementary teachers. Emphasis placed on algebra, probability, and data analysis. Explorations focus on representing, analyzing, generalizing, formalizing, and communicating patterns and probabilities. Content presented using problem solving and exploration. Note: This course assumes that students have taken MCKE 3041. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 3043 - Geometry and Measurement

Third of three courses designed for prospective elementary teachers. Emphasis placed on developing spatial reasoning skills in geometry and measurement. Explorations focus on two- and three-dimensional shapes, their properties, measurements, constructions, and transformations. Note: This course assumes that students have taken MCKE 3041. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MCKE 5000 - Algebraic Patterns and Functions I

Systematic study of the core elements of algebra: linear, quadratic, exponential, logarithmic functions and their graphs. Includes modeling using graphing calculators and real world applications. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5002 - Algebraic Patterns and Functions II

This course is a continuation of the material covered in MATH 5000. Topics that will be covered include logarithmic, exponential and trigonometric functions and applications, parametric equations, systems of equations and inequalities, matrices and linear programming. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 5000 or permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5004 - Statistics and Probability

Studies the collection, presentation, and analysis of data; and elements and applications of counting discrete probability. Includes real world applications and technology. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5005 - Geometry

Systematic study of advanced geometric concepts: history of geometry and measurement, patterns among shapes, 2- and 3-dimensional shapes, constructions, symmetry or transformational geometry. Includes applications and activity-oriented instruction. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal and Sciences. Prereq: permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5006 - Mathematics of Change

Systematic study of the application of calculus to the analysis of changing systems in real world applications. Emphasizes the connections that exist between calculus and aspects of middle school curricula. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 5000 (or equivalent) or permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5007 - Discrete Math--Counting the Possibilities

Systematic study of basic techniques in discrete mathematics and their various applications: permutations and combinations, inclusion or exclusion, pigeonhole principle, graph theory, and recursive pattern solving. Applications to topics such as network analysis and voting theory are stressed. Concepts are linked to other scientific, mathematical, pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 5000 (or equivalent) or permission of project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5008 - Discovery and Use of the History of Math

Systematic study of the people, events, ideas and issues from the history of mathematics, focusing on historical topics that are central to the discipline and teaching of mathematics and emphasizing web research of historical topics of interest. Concepts are linked to other scientific, mathematical, and pedagogical domains. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: permission of the project director. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5009 - Math Modeling--Using and Applying Math

Systematic study of math modeling using algebra, geometry, discrete mathematics, rates of change, and statistics to solve real-world problems in areas such as finance, biology, economics, and physics. Concepts are linked to other scientific, mathematical, societal, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 5006 (or equivalent) or permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5011 - Mathematics and Science of Musical Instruments

A mathematical modeling course which investigates the mathematics and physics behind musical instruments while providing a deeper understanding of trigonometry and elementary calculus concepts. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 5000, 5002. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MCKE 5018 - Topics in Mathematics Education for Teachers

Topics vary from semester to semester. Designed for professional mathematics teachers. This course will not count towards a degree in Applied Mathematics. Consent of the instructor required for enrollment. Max hours: 50 Credits. **Semester Hours:** 0 to 50

MCKE 5140 - Introduction to Modern Algebra

Studies the fundamental algebraic structures used in modern mathematics. Topics include groups, rings, fields, and polynomials. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 3000. Cross-listed with MATH 4140. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 5210 - Higher Geometry I

Studies the foundations of modern geometry by examining axiomatic systems for various geometrics, with an emphasis on non-Euclidean hyperbolic geometry. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 3000. Cross-listed with MATH 3210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 5250 - Problem Solving Tools

Students learn and refine both problem solving techniques and computer programming skills. Examples, exercises, and projects are taken from a wide range of mathematical topics including algebra, calculus, linear algebra and probability. Note: This course will not count toward a graduate degree in applied mathematics. Prereq: Graduate standing in Applied Mathematics or permission of the instructor. Note: This course assumes that students have mathematical knowledge equivalent to three semesters of calculus (e.g., MATH 1401, 2411, 2421). This course can be taken concurrently with MATH 2421. Cross-listed with MATH 3250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 5310 - Introduction to Real Analysis I

Calculus of one variable, the real number system, continuity, differentiation, integration theory, sequence and series. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 2421 and 3000. Cross-listed with MATH 4310. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 5408 - Applied Graph Theory

Introduces discrete structures and applications of graph theory to computer science, engineering, operations research, social science, and biology. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits, matching and covering problems, shortest route and network flows. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 3000. Cross-listed with MATH 4408. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 5409 - Applied Combinatorics

Major emphasis is on applied combinatorics and combinatorial algorithms, with applications in computer science and operations. Topics include general counting methods, generating functions, recurrence relations, inclusion-exclusion, and block designs. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: MATH 3000. Cross-listed with MATH 4409. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MCKE 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MECH 1025 - CAD and Graphics for Mechanical Engineering

Introduction to 3-D computer-aided design software, solid modeling, industry-standard engineering drawing practices, and engineering graphics. Applications to mechanical engineering. Prereq: High School Geometry and Algebra. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 1045 - Manufacturing Processes Design

Basic manufacturing background will be provided to engineering students in order to: (1) apply manufacturing specifications to the design of mechanical devices, and (2) communicate with technical personnel in a production environment. Topics cover metal casting, bulk and sheet metal forming, material removal and joining and fastening processes. Prereq: MECH 1025 or CVEN 1025 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 1208 - Special Topics

Subject matter to be selected from topics of current technological interest. Credit to be arranged. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 2023 - Statics

A vector treatment of force systems and their resultants; equilibrium of trusses, beams, frames, and machines, including internal forces and three-dimensional configurations, static friction, properties of areas, distributed loads and hydrostatics. Prereq: PHYS 2311 with a C- or higher. Coreq: MATH 2411. Cross-listed with CVEN 2121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 2024 - Introduction to Materials Science

The development of the physical principles relating the structural features of materials to their observed properties. Prereq: CHEM 1130 or (CHEM 2031 and CHEM 2038 and CHEM 1999AE). Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 2030 - Analysis Techniques in Mechanical Engineering

Introduces experimental methods and mathematical analysis used in engineering. Spreadsheets are used to analyze engineering data and prepare tables and graphs. Introduction to computer programming using MATLAB. Prereq: MATH 1401 and MECH 1025 with a grade of C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 2033 - Dynamics

A vector treatment of dynamics of particles and rigid bodies, including rectilinear translation, central-force, and general motion of particles, kinematics of rigid bodies, the inertia tensor, plane motion of rigid bodies, energy and momentum methods for particles, systems of particles, and rigid bodies. Prereq: MECH 2023 or CVEN 2121 with a C- or higher. Cross-listed with CVEN 3111. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 2034 - Properties of Engineering Materials

Experiments to determine material properties and the effect of processing on properties important in mechanical design. Materials include metal, polymers, and composites. Loadings include tension, compression, and bending under static, dynamic impact and creep states. Coreq: MECH 2024. Restricted to majors in CEAS Mechanical Engineering. Max hours: 1 Credits. **Semester Hours:** 1 to 1

MECH 2208 - Special Topics: 2208-2298

Subject matter to be selected from topics of current technological interest. Credit to be arranged. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 3010 - Elementary Numerical Methods and Programming

A development of basic numerical methods used to solve engineering problems. Introduction to MATLAB to implement numerical simulations. Coreq: MATH 3195. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3012 - Thermodynamics

Introduces thermodynamic properties and state relationships, processes and cycles with work and heat transfer. Applications of the first and second laws to energy-related engineering systems. Prereq: MATH 1401 and PHYS 2311 with a C- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3021 - Introduction to Fluid Mechanics

Applies exact and approximate theories to engineering problems in fluids. Examples include potential flow theory, Euler's equations for inviscid fluids, Bernoulli's equations, Navier-Stokes equations, and pipe flow. Prereq: MECH 2033, MECH 3012 and MATH 2421. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3022 - Thermodynamics II

Generalized thermodynamic cycles; general thermodynamic cycle considerations, compressor, expander, heat exchanger processes, refrigeration cycles, mixtures and combustion. Prereq: MECH 3012 or ENGR 3012 and MATH 2421 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3023 - System Dynamics I: Vibrations

Modeling of dynamical systems. Analysis of single and multiple degree of freedom systems. Introduction to continuous systems. Prereq: CVEN 3111 or MECH 2033, MATH 3195 or MATH 3191 and MATH 3200 and MECH 3010 with a C- or higher. Coreq: CVEN 3121 or MECH 3043. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3027 - Measurements

Principles of digital and analog measurements; systems for sensing, transporting, modifying, and outputting information; systematic and random error analysis. The laboratory includes a variety of instruments and components illustrating fundamental experimental measurement techniques and methods. Prereq: MECH 3030 & MATH 3195 or (MATH 3191 & MATH 3200) with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3028 - Laboratory of Mechanical Measurements

Modern techniques for Mechanical measurements. Laboratory includes techniques for the calibration of transducers and analysis of Statistical uncertainty. Data Acquisition Systems used for Signal acquisition and measurement of common mechanical quantities, such as displacement, velocity, acceleration and force. Design and characterization of a second order measurement system based on strain gages. Prereq: MECH 3032 with a C- or higher. Coreq: MECH 3027. Max hours: 1 Credits. **Semester Hours:** 1 to 1

MECH 3030 - Electric Circuits and Systems

Basic electrical engineering concepts for non-majors. Basic study of circuit analysis (RLC and Op-amps), transformers and motor equations, and simple electronic circuits (diodes and transistors). Prereq: MATH 2421 and PHYS 2331 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with ELEC 3030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3031 - Fluids/Thermal Laboratory

Laboratory exercise in compressible and incompressible fluid flow; steady state and transient heat transfer. Prereq: MECH 3012 with a grade of C- or higher. Coreq: MECH 3021 and CVEN 3313. Restricted to majors in CEAS Mechanical Engineering. Max hours: 1 Credits. **Semester Hours:** 1 to 1

MECH 3032 - Electric Circuits and Systems Lab

Basic electrical engineering lab for MECH majors. Coreq: MECH 3030 or ELEC 3030. Restricted to majors in CEAS Mechanical Engineering. Max hours: 1 Credits. **Semester Hours:** 1 to 1

MECH 3035 - Design of Mechanical Elements

Review of mechanics of materials and stress analysis; detailed design of various machine elements such as fasteners, springs, brakes and gears. Includes design project. Prereq: MECH 2024 and MECH 3043 Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3042 - Heat Transfer

Basic laws of heat transfer by conduction, convection, and radiation with engineering design applications. Includes design project. Prereq: MECH 3021. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3043 - Strength of Materials

Application of exact and approximate theories of stress and displacement to engineering problems in solids. Examples include torsion of rods and bending of beams. Combined stresses, principal stresses and energy methods are examined. Prereq: MECH 2023 or CVEN 2121 with a C- or higher. Cross-listed with CVEN 3121. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3065 - Intermediate Dynamics

An in-depth study of Newtonian dynamics with constraints. Mechanism synthesis using graphical and analytic techniques. Prereq: MECH 2033 or CVEN 3111 and MECH 3010 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3147 - Bioengineering

Explores engineering principles that have application in biology, and principles discovered in biology which may have application in engineering. Some topics covered are: cell biology, molecular biology, viscoelasticity, physical theory of plant cell growth aerodynamics, fluid mechanics, biofluid dynamics and animal flight. Restriction: Restricted to MECH majors with junior standing within the College of Engineering and Applied Science. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 3208 - Special Topics

Subject matter to be selected from topics of current technological interest. Credit to be arranged. Restriction: Restricted to MECH majors within the College of Engineering and Applied Science. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 3840 - Independent Study

This category is intended for upper-division level special topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Restriction: Restricted to MECH majors within the College of Engineering and Applied Science. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 4020 - Biomechanics

Static and dynamic biomechanical analysis, effects of mechanical loading on bone and cartilage, design considerations in orthopaedic devices, muscle function, biomechanics of human movement, cardiovascular biomechanics. Prereq: MECH 2023, 2033, MATH 3195 or 3200 with a C- or higher. Cross-listed with MECH 5020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4023 - System Dynamics II: Controls

Introduces the Laplace Transformation. Control system analysis using root locus and frequency response methods. Basic compensation techniques are to be covered. Prereq: MECH 3023 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4024 - Mechanical Behavior of Materials

Studies the response of materials to applied stresses. Emphasis is on the understanding of the relationships between structure and properties. Fracture mechanics and fatigue are introduced. Prereq: MECH 3024 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5024. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4025 - Advanced Biomechanics

This course provides training in computational and experimental methods for biomechanical engineering analysis. Topics include finite element analysis of biological systems, orthopedic device design, medical imaging analysis, mechanical characterization of biological tissues, and biomechanics of human movement. Prereq: MECH 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4035 - Senior Design I

Group and individual projects to design engineering components and systems. Design methodology, product specs, creativity, design reviews, communication, presentations, and report writing are emphasized. MECH 4035 and MECH 4045 form a one year sequence and must be taken consecutively. Prereq: MECH 3035 and 40 hours of MECH courses. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4045 - Senior Design II

Student teams manufacture and construct and/or redesign mechanical parts or assemblies that they designed in previous course (MECH 4035). A proposal, oral progress reports, and a final written report and demonstration are required.

MECH 4035 and MECH 4045 form a one year sequence and must be taken consecutively. Prereq: MECH 4035 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4110 - Numerical Methods for Engineers

Introduces numerical analysis. Solution of linear and nonlinear equation systems. Numerical methods for ordinary and partial differential equations. Engineering applications. Prereq: MATH 3195 or (3191 and 3200) with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4112 - Internal Combustion Engines

Students obtain a sufficient understanding of internal combustion engines that will allow them to perform analysis of combustion thermodynamics and actual cycles, including heat addition, heat loss, air/fuel flow, and engine design and performance. Prereq: MECH 3012 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5112. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4114 - Designing with Composites

Analysis and design of polymers and polymer-based composites. Failure criteria include static strength, stiffness, creep, fatigue, impact and fracture toughness. Design criteria include strength-to-weight ratio and cost-to-strength ratio. Prereq: MECH 3043 or CVEN 3121 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5114. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4115 - Applied Plasticity and Creep

Plastic deformation of materials applied to bulk and sheet metal manufacturing processes such as extrusion, rolling and sheet metal. Linear and nonlinear viscoelastic creep with applications to plates and shells. Prereq: MECH 3043 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5115. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4116 - Robotics

Introduces kinematics, dynamics, and control of robot manipulators. Emphasis is placed on computer use in control of actual robots and in computer simulation of mathematical models of robots. Students must turn in a project report based on the computer simulation. Prereq: MECH 3065 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4120 - Methods of Engineering Analysis

Selected topics from real analyses with applications to engineering analyses. Topics include vector calculus, ordinary differential equations, partial differential equations, and calculus of variations. Prereq: MATH 3195 or (MATH 3191 and MATH 3200) with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4132 - Power Plant Systems Design

Detailed engineering analysis and design of a thermal power plant, including heat balance, selection of equipment (boiler, turbines, heat exchangers, pumps, cooling tower), performance evaluation, economic evaluation and feasibility studies. Prereq: MECH 3022 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4135 - Mechanical Systems Design

Detailed engineering design of mechanical systems. Students work in teams on a project selected for entire class. Projects are similar to typical ones from industry. Course stresses creativity, synthesis, design judgment, and analysis of real-world problems. Oral and written presentations are required. Prereq: MECH 3035 with a C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4136 - Control Systems Design

Detailed engineering design of control systems. Students work in teams on a project selected for entire class. Projects are similar to typical ones from industry. Course stresses creativity, synthesis, design judgment, and analysis of real-world problems. Oral and written presentations are required. Prereq: MECH 4023 with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4141 - Fluid Mechanics

Viscous incompressible fluid flows. Topics include derivation of equations governing viscous compressible fluid motion; specializations to simple flows; boundary-layer theory; similarity solutions; introduction to turbulence and Reynolds stresses. Prereq: MECH 3021 with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5141. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4142 - Thermal Systems Design

Detailed engineering design of thermal/fluids systems. Students work in teams on a project selected for entire class. Projects are similar to typical ones from industry. Course stresses creativity, synthesis, design judgment, and analysis of real-world problems. Oral and written presentations are required. Prereq: MECH and MECH 3021 with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4147 - Engineering Economy

Applies economic and financial principles to evaluation of engineering alternatives. Calculation of annual costs, present worth, and prospective rates of return on investment. Review of systems analysis techniques, including simulation, linear programming, and project scheduling. Restriction: Restricted to MECH majors with junior standing within the College of Engineering and Applied Science. Cross-listed with CVEN 4077. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4155 - Air Conditioning Design

Basic principles of heating and ventilating systems. Determination of heating and cooling loads. Design and layout of heating, ventilating, and air conditioning systems. Includes design project. Prereq: MECH 3022 and MECH 3042 with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4160 - Introduction to Operations Research

Introduces operations research, including mathematical programming models, models for decision alternatives, for procurement and inventory, and for queuing operations. Prereq: MATH 3195 or (MATH 3191 and MATH 3200) with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4163 - Rigid-Body Dynamics

Review of Newtonian dynamics, Lagrange's equations for particles, systems, and rigid bodies. Conservative and non-conservative systems, moments of inertia, principal axes, angular momentum and Euler equations. Illustrations from spinning bodies, including tops, gyro-compass and rotating machinery. Prereq: MECH 2033 or CVEN 3111, MATH 3195 or (MATH 3191 and MATH 3200) with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5163. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4166 - Computerized Numerical Control (CNC) Manufacturing

Modern manufacturing engineering concepts using computerized numerical control (CNC). The students learn state-of-the-art CNC methodologies, including digitizing, drawing, generating codes, and manufacturing, using modern CNC machines. Restriction: Restricted to MECH majors with junior standing within the College of Engineering and Applied Science Cross-listed with MECH 5166. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4175 - Finite Element Analysis in Machine Design

Students learn basic theory of finite element analysis (FEA) as it applies to stress analysis and design of mechanical components. Commercial package will be used giving students practical experience in the use of FEA. Prereq: MECH 3035 with a grade of C- or higher. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5175. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4176 - Introduction to Sports Engineering

Sports Engineering requires working both with the principles of biomechanics and the principles of engineering design and analysis. Using biomechanics is necessary in understanding the forces on the interface between the human athlete and his/her equipment. Recommended Prereq: MECH 2033, 3012 and 3021. Cross-listed with MECH 5176. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4177 - Energy Conversion

This introductory Energy Conversion course introduces the basic background, terminology, and fundamentals of

various forms of energy conversion. The topics covered will include: fuel cells, batteries, photovoltaic systems, solar thermal, and wind energy. Recommended Prereq: MECH 3012. Cross-listed with MECH 5177. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4178 - Solar Engineering

This course provides the student with the basic ideas and calculation procedures on how solar processes work and how their performance can be predicted. Recommended Prereq: MECH 3012. Cross-listed with MECH 5178. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4179 - Introduction to Turbomachinery

This introductory Turbomachinery course introduces the basic background, terminology, and fundamentals of various forms of turbomachines. The analysis of the various turbomachines will be focused on the performance of the turbomachine. Recommended Prereq: MECH 3012. Cross-listed with MECH 5179. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4195 - Solid Modeling

This is a basic course in solid modeling using Solid Works computer software. Topics include feature-based modeling, parametric part design, parent/child relationships, use of datums, patterning, relations, sweeps, blends, assembly, tolerancing, rapid prototyping, CNC manufacturing, CMM inspection, and Step standards. Prereq: Restricted to major in CEAS Mechanical Engineering with junior standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 4208 - Special Topics

Subject matter to be selected from topics of current technological interest. Credit to be arranged. Restricted to majors in CEAS Mechanical Engineering. Cross-listed with MECH 5208. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 4840 - Independent Study

This category is intended for upper division level special topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Restricted to majors in CEAS Mechanical Engineering. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 5001 - Seminar: Introduction to Research

This course is intended to introduce graduate students to the fundamental skills and methods needed to perform research. Topics include writing technical papers, presentation skills, testing methodology, hypothesis creation and more. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MECH 5020 - Biomechanics

Static and dynamic biomechanical analysis, effects of mechanical loading on bone and cartilage, design considerations in orthopaedic devices, muscle function, biomechanics of human movement, cardiovascular biomechanics. Graduate standing or permission of the instructor required. Cross-listed with MECH 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5024 - Mechanical Behavior of Materials

Students will learn about the mechanical behavior of materials using a multi-scale, materials oriented approach. The course will relate how atomistic and molecular mechanisms relate to macroscopic and continuum properties of materials across acute and long-term time scales. Graduate standing or permission of the instructor required. Cross-listed with MECH 4024. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5025 - Advanced Biomechanics

This course provides training in computational and experimental methods for biomechanical engineering analysis. Topics include finite element analysis of biological systems, orthopedic device design, medical imaging analysis, mechanical characterization of biological tissues, and biomechanics of human movement. Prereq: MECH 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5110 - Numerical Methods for Engineers

Introduces numerical analysis. Solution of linear and nonlinear equation systems. Numerical methods for ordinary and partial differential equations. Engineering applications. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5112 - Introduction to Internal Combustion Engines

This course provides an introduction to the major characteristics of internal combustion engines and defines the major parameters used to describe the engine operation and design conditions. Students perform analysis of the thermal performance of the engines. Graduate standing or permission of the instructor required. Cross-listed with MECH 4112. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5114 - Designing with Composites

Analysis and design of polymers and polymer-based composites. Failure criteria include static strength, stiffness, creep, fatigue, impact and fracture toughness. Design criteria include strength-to-weight ratio and cost-to-strength ratio. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4114. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5115 - Applied Plasticity and Creep

Plastic deformation of materials applied to bulk and sheet metal manufacturing processes such as extrusion, rolling and sheet metal. Linear and nonlinear viscoelastic creep with applications to plates and shells. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4115. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5120 - Methods of Engineering Analysis

Selected topics from real analyses with applications to engineering analyses. Topics include vector calculus, ordinary differential equations, partial differential equations and calculus of variations. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5121 - Introduction to Fluid Dynamics

Physical properties of gases and liquids; kinematics of flow fields; equations describing viscous, heat-conducting Newtonian fluids. Exact solutions and rational approximations for low- and high-speed dissipative flows, surface and internal waves, acoustics, stability, and potential flows. Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5122 - Macroscopic Thermodynamics

Axiomatic presentation of fundamentals of classical thermodynamics (first law); energy, work and heat. Equilibrium, reversible, and irreversible processes; entropy production and the second law. Applications to stability and phase equilibrium. Irreversible thermodynamics and the Onsager reciprocal relations. Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5123 - Introduction to Continuum Mechanics

Cartesian tensor notation. Deformation, strain, strain rate and compatibility. Definition of stress vector and tensor. Fundamental balance laws of mass, momentum and energy; entropy production inequality. Constitutive equations for elastic, viscoelastic and plastic materials; ideal, compressible, and viscous fluids. Beltrami-Mitchell and Navier-Stokes equations. Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5124 - Yield-Limited Behavior of Materials

Analysis of material behavior within the "elastic range," with emphasis on the phenomenon of yield and factors that influence it. Examination of the theory of dislocations; study of strengthening mechanisms in solids. Consideration of various time-dependent but reversible (inelastic) deformation phenomena. Presentation of appropriate engineering case studies to augment various topics. Graduate standing or permission of the instructor required. Prereq: MECH 5143 with a grade of B- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5133 - Theory of Inelastic Materials

Mathematical theory of linear viscoelasticity. Finite elements models. Solution of boundary-value problems in linear viscoelasticity. Non-Newtonian flow. Selected topics in nonlinear material behavior. Graduate standing or permission of the instructor required. Prereq: MECH 5143 with a B- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5141 - Viscous Flow

Viscous incompressible fluid flows. Topics include derivation of equations governing viscous compressible fluid motion; specializations to simple flows; boundary-layer theory; similarity solutions; introduction to turbulence and Reynolds stresses. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4141. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5142 - Statistical Thermodynamics

Introduces the molecular interpretation and calculation of thermodynamic properties of matter, thermodynamic probability, distribution functions, Schrodinger wave equations and solutions and ensemble theory. Applications to ideal and real gases, solids, liquids, radiation, conduction electrons, and chemical equilibrium. Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5143 - Theory of Elasticity

Review of the basic equations of linear theory of elasticity. St. Venant torsion and flexure. Plane strain, plane stress, and generalized plane stress. Application of conformal mapping and Fourier transform techniques. Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5144 - Plasticity and Creep

Inelastic deformation of materials such as metals, alloys, glasses, composites and polymers from the phenomenological and structural point of view. Case studies of plastic and creep deformations in engineering materials. Prereq: MECH 5143 with a grade of B- or higher and graduate standing or permission of the instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5161 - Compressible Flow

Energy, continuity, and momentum principles applied to compressible flow; one-, two-, and three-dimensional subsonic, supersonic and hypersonic flows. Normal and oblique shocks, and method of characteristics. Prereq: MECH 5141 with a grade of B- or higher and graduate standing or permission of the instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5162 - Heat Transfer I

Review of equations governing transport of heat by conduction and radiation. Analytical and numerical solution of boundary value problems representative of heat conduction in solids. Radiation properties of solids, liquids and gases; transport of heat by radiation. Prereq: Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5163 - Dynamics

Review of Newtonian dynamics, Lagrange's equation for particles, systems and rigid bodies. Conservative and non-conservative systems, moments of inertia, principal axes, angular momentum and Euler equations. Illustrations from

spinning bodies, including tops, gyro-compass and rotating machinery. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4163. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5166 - Computerized Numerical Control (CNC) Manufacturing

Modern manufacturing engineering concepts using computerized numerical control (CNC). The students learn state-of-the-art CNC methodologies, including digitizing, drawing, generating codes, and manufacturing using modern CNC machines. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4166. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5172 - Heat Transfer II

Review of equations governing transport of heat in fluids in motion. Description of heat transfer in free and forced convection, including laminar and turbulent flow. Dimensional analysis and heat transfer correlations, numerical methods and combined heat transfer mechanisms. Graduate standing or permission of the instructor required. Prereq: MECH 5141 with a B- or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5175 - Finite Element Stress Analysis

Students learn basic theory of finite element analysis (FEA) as it applies to stress analysis and design of mechanical components. Commercial package will be used giving students practical experience in the use of FEA. Graduate standing or permission of the instructor required. Prereq: MECH 5143 with a B- or higher. Cross-listed with MECH 4175. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5176 - Introduction to Sports Engineering

Sports Engineering requires working both with the principles of biomechanics and the principles of engineering design and analysis. Using biomechanics is necessary in understanding the forces on the interface between the human athlete and his/her equipment. Prereq: Graduate standing or permission of the instructor required. Cross-listed with MECH 4176. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5177 - Energy Conversion

This introductory Energy Conversion course introduces the basic background, terminology, and fundamentals of various forms of energy conversion. The topics covered will include: fuel cells, batteries, photovoltaic systems, solar thermal, and wind energy. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4177. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5178 - Solar Engineering

This course provides the student with the basic ideas and calculation procedures on how solar processes work and how their performance can be predicted. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4178. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5179 - Introduction to Turbomachinery

This introductory Turbomachinery course introduces the basic background, terminology, and fundamentals of various forms of turbomachines. The analysis of the various turbomachines will be focused on the performance of the turbomachine. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4179. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5180 - Advanced Heat Transfer

This course provides fundamental concepts and applicable mathematical techniques for understanding the physics of various modes of heat transfer. Topics include heat conduction in finite and semi-infinite domains, phase change, microscale heat conduction, laminar forced and free convection, turbulence forced and free convection, and thermal radiation. Prereq: Graduate standing or permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5182 - Microscale Transport Phenomena

This course provides the foundations on the physics of microscale transport phenomena, where continuum effects break down, with applications in MEMS and NEMS. Topics include gas microflows, liquid microflows, surface tension-driven flows, electrokinetics transport, kinetic theory, simulation techniques, lattice Boltzmann methods. Prereq: MECH 3021 and MECH 3042. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5208 - Special Topics

Subject matter to be selected from topics of current technological interest. Credit to be arranged. Prereq: Graduate standing or permission of instructor required. Cross-listed with MECH 4208. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MECH 5840 - Independent Study

Available only through approval of the graduate advisor. Subjects arranged to fit needs of the particular student. Graduate standing or permission of the instructor required. Max hours: 6 Credits. **Semester Hours:** 1 to 3

MECH 5939 - Internship

Students gain engineering design experience involving application of specific technical concepts and skills in a supervised industrial environment. (Must have approval from MECH faculty.) Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 5950 - Master's Thesis

Graduate standing or permission of the instructor required. Max hours: 8 Credits. **Semester Hours:** 1 to 6

MECH 5960 - Master's Report

Master of Science in Engineering report. Students seeking the Master of Science in Engineering, and who do not choose to do a thesis, must complete an individual project of an investigative and creative nature under the supervision of a member of the graduate faculty. Graduate standing or permission of the instructor required. Max hours: 6 Credits.

Semester Hours: 3 to 3

MECH 5970 - Graduate Problem Course

The graduate problem course is for the solution of specific problems in MECH specialty areas. Each student is assigned a set of problems of some difficulty requiring the use of the literature of the various areas covered. Prereq: 15 hours of graduate level courses in MECH. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 6184 - Advanced Fluid Mechanics

This course provides a description of the advanced concepts for understanding the physics of fluid motion under different regimes. Topics include kinematics, stresses, equation of motion, vorticity transport, low Reynolds number flow, irrotational flow, interfacial flow, acoustics&waves, hydrodynamic stability & transition, turbulent flow. Prereq: MECH 5141. Restriction: Restricted to students with graduate standing, or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MECH 8990 - Doctoral Dissertation

Graduate standing or permission of the instructor required. Max hours: 10 Credits. **Semester Hours:** 1 to 10

MGMT 1000 - Introduction to Business

This course will introduce students to the nature and role of business in our society. Problems confronting business are surveyed from a management, financial, economic and marketing viewpoint. Career opportunities in business are also considered. Students are advised to take this course during their freshman year and may not take it in the junior or senior years. Prereq: Open to freshman and sophomores, non-degree students and music majors at all levels. Cross-listed with BMIN 1000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 1111 - Business Freshman Seminar

This course introduces students to the nature and role of business in our society. Career opportunities in business are also considered. This course is designed to assist first year students transition to life on campus. The course content is integrated with various activities designed to familiarize 1st year students with school resources, develop critical thinking and writing skills and build relationships critical to ongoing academic success. Students are advised to take this course during the first semester of their freshman year. Note: Credit will not be given for both MGMT 1111 and MGMT 1000. Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 2939 - Internship

Max hours: 3 Credits. **Semester Hours:** 1 to 3

MGMT 3000 - Managing Individuals and Teams

Focuses on helping students understand how to manage individuals and groups effectively. Students are encouraged to know themselves better and how their behavior affects how they deal with organizational situations; they also learn how individuals differ and how to design, manage and work in a team. This is a business core course therefore a grade of a 'C' or better must be earned to satisfy graduation requirements. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 3010 - Managing People for a Competitive Advantage

Provides an overview of the management of human resources in organizations. Areas of study include recruitment, selection, training, career development, performance appraisal, compensation and employee or labor relations. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 3111 - Business Transfer Student Seminar

This course is designed to assist first year transfer students transition to UC Denver. The course includes various activities designed to familiarize students with University and Business School resources, develop critical thinking, writing, time management and study skills, and build relationships critical to ongoing academic success. Students are advised to take this course during their first or second semester at UC Denver. Concurrent registration in MGMT 3000 is required. Cross-listed with MGMT 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 1 Credits. **Semester Hours:** 1 to 1

MGMT 3830 - Business and Sustainability

Business activity can have significant environmental and societal impacts. This course examines some of the ways that companies and consumers are reducing their impact on communities and the environment. Sustainability issues will be considered from a management, finance, marketing, and consumer perspective. Climate change and renewable energy will be featured topics in the class. Prereq: MKTG 3000. Cross-listed with MGMT 4830, BUSN 6830. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 3939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. To enroll in an internship, students must work with the Experiential Learning Center on campus and have a 2.40 GPA or higher. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MGMT 4028 - Travel Study Topics

Join your classmates in an international travel study course to understand the business operations of another culture. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits.
Semester Hours: 3 to 3

MGMT 4100 - Leveraging Diversity and Inclusion in Business

Practical and policy issues that arise from living and working in a multicultural world in order to promote informed, effective management. Particular emphasis is given to the development of innovative approaches to managing the challenges posed by a work force that differs in characteristics, such as race, gender, ethnicity, age, lifestyle and disability. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits.
Semester Hours: 3 to 3

MGMT 4120 - Collaborative Experiential Learning

Explores the place and role of architecture as an instrument of critical social engagement and cultural change. Business students will collaborate with Arch students to explore the role of history and precedent in the design process through client driven projects that demonstrate their proficiency in applying business analysis to project design. Prereq: Senior standing. Restriction: Restricted to undergraduate Business majors. This course will be in collaboration with ARCH 4120. Note: this class will fulfill the Business Schools experiential learning requirement. Max hours: 3 Credits.
Semester Hours: 3 to 3

MGMT 4140 - Negotiation Skills/Property: Effective Strategies

Course covers real and personal property law, including ownership, title, landlord/tenant, easements, environmental law, and zoning. Emerging issues in intellectual property are also reviewed, including U. S. law and international treaties and agreements. Negotiation techniques through role-playing are emphasized. NOTE: This course is an elective course and may not be used to fulfill the CORE BLAW 3050 course. Meets concurrently with BLAW 4140. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4230 - Sports Management

This course is designed as a speaker series of sports and entertainment industry elite focusing on: industry trends, strategic planning, managing revenue streams, managing media, managing for effectiveness, managing post-merger integration, leadership and leading change. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4330 - Mastering Management

Designed to give students hands on practice developing critical management skills, such as communication, conflict handling, negotiation, giving feedback, public speaking, meeting management and self management. Prereq: MGMT 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4350 - Leading Organizational Change

Focuses on the tasks and skills of a leader in leading organizational changes. Topics include: diagnosing problems, creating urgency, building the change team, creating a vision, implementing change strategies, sustaining the momentum and making change stick. These tasks and skills are studied in various organizational change contexts. Prereq: MGMT 3000 with a grade of C or higher. Coreq: MGMT 4370. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4370 - Organization Design

Examines how to structure organizations to perform effectively. Addresses the effects of computer-based information technologies (e.g. intranets, extranets, and the internet) on firm structure, strategy, and culture. Emphasis is placed on the role of the task, technology, and the environment as constraints on organizational design. Prereq: MGMT 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4400 - Environments of International Business

An overview of the environmental complexities that arise when business activities and firms cross national borders. Key international business environmental complexities associated with country differences, cross-border trade and investment, and global monetary system are examined. Prereq: MGMT 3000 with a grade of C (2.0) or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with INTB 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4410 - Operations of International Business

Focuses on the impact of environmental factors on international business operations and the identification and analysis of complex strategic and operational issues facing business firms in global markets. The strategies and structures of international businesses, alternative foreign market entry modes, and the unique roles of various business functions at international business firms are explained and assessed. Prereq: INTB 4400 or MGMT 4400. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with INTB 4410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4420 - Human Resources Management: Staffing

Methods, theories, research findings, and issues in staffing. Topics include performance-based framework for selecting employees, establishing performance expectations, planning the recruitment process and finding valid and useful tools to select the best candidate. Prereq: MGMT 3010 (may be taken concurrently). Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4430 - Human Resources Management: Training

Methods, theories, research findings, and issues in training. Topics include how to design, deliver, and evaluate training programs. Coreq: MGMT 3010. Cross-listed with MGMT 6720. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4440 - Human Resource Management: Performance Management

Focuses on the design and implementation of human resource management systems to assess and enhance employee performance. Areas of study include performance definition and measurement, goal setting, feedback, employee development, rater training, and pay for performance. Coreq: MGMT 3010. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4450 - Human Resources Management: Compensation

Develop and administer pay systems considering economic and social pressures, traditional approaches and strategic choices in managing compensation. Current theory research and practice. Students design a compensation strategy and a system that translates that strategy into reality. Prereq: DSCI 2010 or BANA 2010 with a grade of 'C-' or higher. Coreq: MGMT 3010. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with MGMT 6740. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4460 - Employee Benefits and Workforce Risk Management

The course surveys an array of popular employee benefit programs to attract, protect, and retain valued employees. It also focusses on risk management programs that invest in human capital and address the downside risks of employing a workforce. Cross-listed with MGMT 6760 and RISK 4409/6409. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4481 - Human Resources Management: Career and employment coaching

Focuses on enhanced approaches to discovering employment opportunities and providing career coaching, with an emphasis on unemployed veterans. Topics include discovering the unique capabilities a job-seeking veteran possesses, addressing the barriers to employment he or she may face, and methods the job seeker can use to educate prospective employers about the contributions to organizational success he or she can make. Cross-listed with MGMT 6781. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4482 - Human Resources Management: Connecting talent with business needs

Focuses on methods for connecting businesses and public-sector organizations with job seekers who possess the capabilities that will fuel profitable growth and mission success. Topics include networking to establish relationships with hiring decisions makers, exploration conversations to identify an organization's success factors, and identifying job seekers (with a special emphasis on unemployed veterans) with the requisite skills, knowledge, traits, and aptitudes. Cross-listed with MGMT 6782. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4500 - Business Policy and Strategic Management

Emphasis is on integrating the economic, market, social or political, technological, and components of the external environment with the internal characteristics of the firm; and deriving through analysis the appropriate interaction between the firm and its environment to facilitate accomplishment of the firm's objectives. Open only to business students in their graduation semester. This is a business core course therefore a grade of 'c' or better must be earned to

satisfy Business graduation requirements. Prereq: Senior standing and completion of all business core courses with appropriate grade; Core = ISMG 2050, DSCI/BANA 2010, ACCT 2200, ACCT 2220, BLAW 3050 (or BLAW 3000) all with a 'C-' or higher; ISMG 3000, DSCI/BANA 3000, FNCE 3000, MGMT 3000, and MKTG 3000 all with a grade of 'C' or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4770 - Human Resource Information Systems

Focuses on the management of human resource information systems. It addresses how modern information systems tools can provide better human resource intelligence to users in today's enterprises, allowing them to make better decisions. It examines how information about workforce and human resource management processes can be collected and used to set targets to meet strategic objectives, monitor performance, receive notifications when performance is below expectations and respond immediately by taking corrective actions. Prereq: MGMT 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4780 - Preparing A Business Plan

Turn a new business idea into a viable new business by developing a comprehensive business plan including: analysis of the potential demand for the product or service and potential customers; identify competitive advantages and marketing strategies; generate pro forma financial projections; and, design the management team needed. Prereq: ENTP 3000 AND either ENTP 3500 with a grade of 'C-' or higher or BLAW 4120 or ENTP 3120 with a grade of 'C' or higher. For non-business majors only. Can be applied to Entrepreneurship Certificate. Business majors enroll in either MGMT 4780 or MKTG 4780. Come to first class meeting with a carefully considered business idea. Cross-listed with MKTG 4780 and ENTP 3780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4824 - Sustainable Business/CSR Field Study

Gain practical, hands-on experience with aspects of sustainable business and/or corporate social responsibility. Work with a local company/non-profit/or government organization under the direction of an executive to conduct a sustainability-focused project which is important to the organization's sustainability initiative. Students may petition to use previous coursework or experience in sustainability to fulfill the prerequisite. Please contact the undergrad.advising@ucdenver.edu for more details. Prereq: MGMT 3830 or MGMT 4110 with a C or higher or department consent. Restrictions: Restricted to undergraduate majors within the Business School. Cross-listed with MGMT 6824. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4830 - Business and Sustainability

Business activity can have significant environmental and societal impacts. This course examines some of the ways that companies and consumers are reducing their impact on communities and the environment. Sustainability issues will be considered from a management, finance, marketing, and consumer perspective. Climate change and renewable energy will be featured topics in the class. Prereq: MKTG 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with MGMT 3830, BUSN 6830. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 4832 - Law & Negotiation in the Sports and Entertainment Industry

This course provides an overview of major legal issues in the sports and entertainment industries. Students develop the

skills required to negotiate contracts in these industries. Topics include contracts, copyright, trademark, employment and tort law principles relevant in the sports and entertainment fields. Prereq: MGMT 3000 with a grade of C (2.0) or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits.
Semester Hours: 3 to 3

MGMT 4834 - Global Sports & Entertainment Management

Through 2 weeks of visiting organizations with industry elite in London a broader perspective on the sports and entertainment industry is gained. Students will be asked to do advance reading, participate in discussions, keep a journal and write a reflection paper at the end of the experience. Site visits(to be confirmed) include: Arsenal Football Club, Premier League, the O2 Arena, NHL and NBA regular season games in London, 2012 Olympics Committee, Formula One, Hollywood Studio-International Finance Office, Theatre, Lord's Cricket Ground, All England Lawn Tennis Club/Wimbledon and the Office of the Minister of Sport. Prereq: MGMT 3000. Cross-listed with MGMT 6834. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits.
Semester Hours: 3 to 3

MGMT 4840 - Independent Study

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 8 Credits.
Semester Hours: 1 to 8

MGMT 4900 - Project Management and Practice

Covers the factors necessary for successful management of system development or enhancement projects. Both technical and behavioral aspects of project management are discussed. The focus is on management of development for enterprise-level systems. Topics include: managing the system life cycle; requirements determination, logical design, physical design, testing, implementation; system and database integration issues; network and client-server management; metrics for project management and system performance evaluation; managing expectations: superiors, users, team members and others related to the project; determining skill requirements and staffing the project; cost-effectiveness analysis; reporting and presentation techniques; effective management of both behavioral and technical aspects of the project; change management. Note: Successful completion of this course meets the educational requirements to sit for both the PMP and CAPM exams. Prereq: Students must be a junior status and have completed either: 1. MGMT 3000, MKTG 3000 and ISMG 3000 OR 2. ISMG 3000, ISMG 3500 and ISMG 3600. Restriction: Restricted to undergraduate students in the Business School. Cross-listed with ISMG 4900. Max hours: 3 Credits.
Semester Hours: 3 to 3

MGMT 4950 - Special Topics in Management

A number of different topics in management are offered under this course number. Consult the 'Schedule Planner' for current course offerings. Prerequisites vary depending on the topic and instructor requirements. Cross-listed with MGMT 5800. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MGMT 5800 - Special Topics in Management

A number of different topics in management are offered under this course number. Consult the Schedule Planner for

current course offerings. Prerequisites vary depending on the topic and instructor requirements. Cross-listed with MGMT 4950. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MGMT 5939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. Prereq: 21 semester hours and 3.5 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MGMT 6020 - Leadership in Difficult Times

The test of a leader often is their ability to lead their organizations through difficult times and crises. Such situations could be downsizing, product defects, ethical violations, a terrorist attack or a natural disaster. Successful management of these situations can strengthen and renew the organization. Inability to manage these situations can tarnish the organization's reputation and threaten its survival. This course examines leadership under stress and provides frameworks for categorizing and analyzing these difficult situations. The course also addresses strategies that leaders can use to enable their organizations to manage, recover and learn from these difficult experiences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6028 - Travel Study Topics

Join your classmates in an international travel study course to understand the business operations of another culture. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MGMT 6040 - Managing Global Talent

This course has two objectives: (1) to understand the impact of cultural differences in the management of people in multinational firms; and (2) to compare and contrast critical human resource issues in the contexts of domestic and international operations. Topics include recruitment, staffing, training, performance appraisal, compensation, and labor and management relations in markets around the world. (This course qualifies as an international elective for the MS in International Business program). Prereq: BUSN 6520 or MGMT 6380. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Cross-listed with INTB 6040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6320 - Leading Organizational Change

Instruction in the analysis, diagnosis, and resolution of problems in organizing people at work. Models of organizational change are examined. Group experiences, analysis of cases and readings are stressed. Coreq: BUSN 6520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6360 - Designing Effective Organizations

Examines how to design organizations within the context of environmental, technological, and task constraints. The emphasis is on learning how to recognize and correct structural problems through the analysis of existing organizations in which the students are involved. Coreq: BUSN 6520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6380 - Managing People for Competitive Advantage

Focuses on the management of human resources in organizations. Oriented toward the practical application of human resources management principles in areas such as: equal employment opportunity, affirmative action, human resources planning, recruitment, staffing, benefits and compensation, labor relations, training, career management, performance management, and occupational health and safety. Coreq: BUSN 6520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6610 - Business Strategy Lab

Gain strategy experience collaborating with and consulting to Senior Executives of a client company. This is a hands on, project-based course. Students will analyze a strategic initiative as defined by and with the organization's leadership and provide their client with research, insights and actionable strategic ideas. Prereq: BUSN 6560 or consent of instructor. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6710 - Human Resources Management: Staffing

Focuses on the design and implementation of human resources management systems to recruit and select employees. Areas of study include planning, job analysis, external and internal recruitment and selection, and decision making. Prereq: MGMT 6380. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6720 - Human Resources Management: Training

Methods, theories, research findings, and issues in training. Topics include how to design, deliver, and evaluate training programs. Prereq: MGMT 6380. Cross-listed with MGMT 4430. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6730 - Human Resources Management: Performance Management

Focuses on the design and implementation of human resources management systems to assess and enhance employee performance. Areas of study include performance measurement, rater training, goal setting and feedback. Prereq: MGMT 6380. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6740 - Human Resources Management: Compensation

Develop and administer pay systems considering economic and social pressures, traditional approaches and strategic choices in managing compensation. Current theory research and practice. Students design a compensation strategy and a system that translates that strategy into reality. Prereq: MGMT 6380 and BUSN 6530. Cross-listed with MGMT 4450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6750 - HRM: Investing in People: HR Analytics

Managing talent-organization and deployment-and connections between talent and strategy in organizations. Rooted in a systematic, logical approach that challenges traditional ideas. Stresses the logical connections between progressive

HR practices and firm performance and the use of data to demonstrate financial impact of the connections. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6760 - Employee Benefits and Workforce Risk Management

The course surveys an array of popular employee benefit programs to attract, protect, and retain valued employees. It also focusses on risk management programs that invest in human capital and address the downside risks of employing a workforce. Cross-listed with MGMT 4460 and RISK 4409/6409. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6780 - Small Business Management

The primary objective of this course is to teach future small business owners the practical aspects of small business management and to develop the skills necessary to improve the odds of success. The course will consider strategies to leverage limited resources for maximum effect in managing the small business enterprise. Also, this course covers small organization and group behavior, performance, leadership and motivation in small business settings and focuses on the owner/manager as the principal success factor in the context of a small organization. Max hours: 3 Credits.

Semester Hours: 3 to 3

MGMT 6781 - Human Resources Management: Career and employment coaching

Focuses on enhanced approaches to discovering employment opportunities and providing career coaching, with an emphasis on unemployed veterans. Topics include discovering the unique capabilities a job-seeking veteran possesses, addressing the barriers to employment he or she may face, and methods the job seeker can use to educate prospective employers about the contributions to organizational success he or she can make. Cross-listed with MGMT 4481. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6782 - Human Resources Management: Connecting talent with business needs

Focuses on methods for connecting businesses and public-sector organizations with job seekers who possess the capabilities that will fuel profitable growth and mission success. Topics include networking to establish relationships with hiring decisions makers, exploration conversations to identify an organization's success factors, and identifying job seekers (with a special emphasis on unemployed veterans) with the requisite skills, knowledge, traits, and aptitudes. Cross-listed with MGMT 4482. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6800 - Special Topics in Management

Current topics in management will be occasionally offered. Consult the 'Schedule Planner' for specific offerings or contact an advisor for information. Max hours: 6 Credits. **Semester Hours:** 3 to 3

MGMT 6801 - Career Strategies

The downsizing, restructuring, and re-engineering so prevalent in U.S. industries and companies have strongly affected the job and career market. Every individual must sharpen his/her competencies and skills in order to compete effectively in the changing job market. This course is designed to assist students in understanding and operating in this difficult job market. Using many of the concepts that organizations use in their strategy formulation process, and coupled with individual techniques and skills proven effective in job searches and career planning, this course prepares students to deal with the issues involved in finding a job and pursuing a career. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6803 - Visionary Leadership

Examines the challenges faced by visionary leaders and the approaches used by these individuals (creation, articulation, and implementation of vision) to transform organizations. Participants utilize these approaches employed by effective leaders to develop plans for their own organizational success. Group experiences, applied readings, and videos are used to clarify the opportunities available. Coreq: BUSN 6520 or 6521. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6804 - Bargaining and Negotiation

Designed as a seminar in bargaining, negotiation and interpersonal conflict management. Through simulations, role plays and personal experience, students practice and develop their negotiation skills and see how negotiations differ depending on the type of situation encountered. Specific topics covered include: the nature of negotiation, the role of the negotiation context, interdependence and power, strategies and tactics of distributive and integrative bargaining, negotiation ethics and interpersonal conflicting resolution. Coreq: BUSN 6520 or BUSN 6521. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6806 - Corporate Entrepreneurship

Competitive performance in a global economy requires continuous innovation and new business growth. The creation and development of new ventures is a primary strategy for internally-generated growth. Managing innovation and new ventures requires attitudes, knowledge, and practices different from those usually required for the management of mature business units. This course provides the perspective, knowledge, and specific skills required for successful entrepreneurial management. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6808 - Leadership Development

Instruction in the design and practice of leadership development. Case studies of effective organizations will be examined and a variety of assessment and development activities will be completed as part of the course. Students will learn how to develop others while experiencing the development techniques first hand. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6820 - Management Field Studies

The objective of this course is to provide an opportunity for the in-depth examination of an actual management problem in a local organization. Much like an independent study conducted under faculty guidance, each student will execute a

unique project suited to his or her interests. Priority is given to MGMT students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6821 - Managing for Sustainability

This course will consider how companies are using social responsibility as a competitive advantage. The so-called green revolution is calling for organizations to take on increasing responsibility for environmental conservation, employee well being, and community development. This course considers how organizations can work with various stockholders (employees, customers, communities, society-at-large) to develop and promote mutually beneficial products and solutions to key social needs and concerns. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6822 - Business Ethics and Corporate Social Responsibility

Covers business ethics and corporate social responsibility in the global contexts of employment, marketing, product liability, the environment and other areas. Students compare ethical theories, including utilitarianism, Kantian, Rawlsian, stockholder, stakeholder and social contract and apply some or all of these theories to actual and hypothetical case studies. The doctrine of corporate social responsibility is defined and explored and diverging views of corporate social responsibility are discussed. Examples of how corporate social responsibility can increase a company's goodwill and net income are analyzed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6823 - The Sustainable Business Opportunity

This course examines the negative impact of a rapidly growing global economy on the natural and human environment. It shows that the need to create a more sustainable global economy represents a huge opportunity for business and how sustainability-based strategies drive innovation, competitive advantage and improved financial performance. It will examine both environmental aspects of sustainability like green supply chains, lifecycle analysis, energy and water efficiency, as well as initiatives that nurture and enhance the value of our human resources such as community development, employee and customer relations, employee wellness, telecommuting, and other stakeholder engagement in sustainability. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6824 - Sustainable Business/CSR Field Study

Gain practical, hands-on experience with aspects of sustainable business and/or corporate social responsibility. Work with a local company/non-profit/or government organization under the direction of an executive to conduct a sustainability-focused project which is important to the organization's sustainability initiative. Prereq: Completion of one or more sustainability focused courses or permission of instructor. Cross-listed with MGMT 4824. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6830 - Sports and Entertainment Management

This course is designed as a speaker series of sports and entertainment industry elite focusing on: industry trends, strategic planning, managing revenue streams, managing media, managing for effectiveness, managing post-merger integration, leadership and leading change. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6832 - Law and Negotiation in the Sports/ Entertainment Industries

Provides an overview of major legal issues in the sports and entertainment industries. Students develop the skills required to negotiate contracts in these industries. Topics include contracts with athletes (agency, player and sponsorship), stadium financing and sports franchises, labor law and collective bargaining agreements, entertainment contracts in the music, film and live theater fields and copyright, trademark and tort law principles in the sports and entertainment industries. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6834 - London Calling: Global Sports and Entertainment Management

Through 2 weeks of visiting organizations and talking with industry elite in London a broader perspective on the Sports and Entertainment Industry is gained. Students will be asked to do advanced reading, participate in discussions, keep a journal and write a reflection paper at the end of the experience. Site visits (to be confirmed) include: Arsenal Football Club, Premier League, the O2 Arena, NHL and NBA regular season games in London, 2012 Olympics Committee, Formula One, Hollywood Studio-International Finance Office, Theatre, Lord's Cricket Ground, All England Lawn Tennis Club/Wimbledon and the office of the Minister of Sport. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MGMT 6840 - Independent Study

Instructor approval required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Max hours: 8 Credits. **Semester Hours:** 1 to 8

MGMT 6950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

MINS 5000 - Topics

With prior approval by a candidate's advisor, an MIS candidate may enroll in an upper division course in science, computer science, mathematics, and complete additional work for graduate credit. Prereq: MIS candidate with 12 hours of upper division work completed. Max hours: 8 Credits. **Semester Hours:** 3 to 4

MINS 5840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

MINS 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MINS 5939 - Internship

Max hours: 3 Credits. **Semester Hours:** 1 to 3

MINS 5950 - Master's Thesis

Prereq: advisor approval. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MINS 5960 - Master's Project

Prereq: advisor approval. Max hours: 8 Credits. **Semester Hours:** 1 to 4

MKTG 1000 - Introduction to Marketing

Provides an introduction and overview of marketing. Discusses market and buyer analysis. Includes product planning, pricing, promotion and distribution of goods and services. For non-business majors only. Does not satisfy the MKTG 3000 business requirement. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 2939 - Internship

Introductory supervised experiences involving the applications, concepts and skills in an employment situation. Prereq: sophomore standing Max hours: 1 Credit. **Semester Hours:** 1 to 1

MKTG 3000 - Principles of Marketing

Focuses on the basic marketing concepts of Buyer Behavior, Marketing Research, Marketing Planning and Implementation and the marketing process of product, price, distribution and promotion. This is a business core course therefore a grade of a 'C' or better must be earned to satisfy graduation requirements. Restriction: Restricted to undergraduate students at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 3100 - Marketing Research

Provides practical experience in research methodologies, planning an investigation, designing a questionnaire, selecting a sample, interpreting results and making a report. Techniques focus on attitude surveys, behavioral experiments, and qualitative research. Prereq: DSCI/BANA 2010 with a 'C-' or higher and MKTG 3000 with a grade of 'C' or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 3200 - Buyer Behavior

Focuses on improving the student's understanding of consumer and organizational buying behavior as a basis for better formulation and implementation of marketing strategy. Blends concepts from the behavioral sciences with empirical evidence and introduces buyer research techniques. Prereq: MKTG 3000 with a grade of C or higher. Restriction:

Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 3300 - Social Media in Business

Social media has become a central component of many business activities including marketing, HR, product management and the supply chain. In this course, we examine the organizational use of social media technologies such as blogs and social networks, as well as the use of social media analytics to drive business strategy. Cross-listed with ISMG 3300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 3939 - Internship

Supervised experiences involving the application of concepts and skills in an employment situation. To enroll in an internship, students must work with the Experiential Learning Center on campus and have a 2.40 GPA or higher. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MKTG 4000 - Advertising

Analyzes principles and practices in advertising from a managerial viewpoint. Considers the reasons to advertise, product and market analysis as the planning phase of the advertising program, media selection, creation and production of advertisements, copy testing, and development of advertising budgets. Prereq: MKTG 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4050 - Applied Marketing Management

The course is designed to enhance the student's ability to formulate and implement a marketing plan and to better understand the relationship of marketing to other business functions. Emphasized application of marketing concepts through the use of cases, simulations or projects. Prereq: MKTG 3000 with a grade of 'C' or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4051 - Honors Applied Marketing Management

Offered as the second course in a sequence following the principles of marketing course (MKTG 3000) it is therefore designed to enhance the student's ability to formulate and implement a marketing plan and to better understand the relationship of marketing to other business functions. It will emphasize application of marketing concepts through the use of cases, simulations or projects. This Honors course is modeled after understanding of the concepts covered. Note: MKTG 4051 is open only to marketing majors who have a cumulative GPA of 3.2 or higher. Students taking MKTG 4051 cannot receive credit for MKTG 3050 or MKTG 4050. Prereq: MKTG 3000, cumulative GPA of 3.2 or higher. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4200 - International Marketing

Studies managerial marketing policies and practices of firms marketing their products in foreign countries. Analytical survey of institutions, functions, policies, and practices in international marketing. Relates marketing activities to market structure and environment. Prereq: MKTG 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with INTB 4200. Max hours: 3 Credits.

Semester Hours: 3 to 3

MKTG 4220 - Asian Business Development and Marketing

This course investigates methods of Business Development and Marketing in the Asian Business Environment. It seeks to examine and explain methods of determining market potential and techniques tapping this market potential in this dynamic and rapidly growing business environment the course uses a combination of experienced guest speakers, Asian business cases and projects to develop the marketing skills in students to successfully compete in Asia. Prereq: MKTG 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4250 - Sports Marketing

This course is designed to understand and evaluate the role and functions of marketing in sports organizations. The course seeks to evaluate the marketing function in sports as well as understand the behavior of fans as consumers, celebrity product endorsements, sponsorship of sporting events for all sport providers, sports intermediaries and channels and advertising and promotion in the sports world. The course is taught using lectures, guest speakers, cases and examinations. Prereq: MKTG 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4580 - International Transportation

Analysis of international transportation (primarily sea and air) in world economy. Detailed study of cargo documentation and freight rate patterns. Included are liability patterns, logistics, economics, and national policies of transportation. Prereq: MKTG 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4620 - Customer Service Strategies

This course is designed to help students identify and effectively use managerial concepts of customer service. Students will develop an understanding of the concepts as well as knowledge of the strategies that will lead to higher levels of customer satisfaction, loyalty and ultimately customer retention. Students will have the opportunity to gain firsthand knowledge of these concepts and strategies through lectures, guest speakers, cases and projects. Prereq: MKTG 3000 with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4700 - Personal Selling and Sales Management

Introduces the student to principles of personal selling and issues in managing the field sales force. Focuses on models of personal selling, recruiting, selection, training, compensation, supervision, and motivation, as well as organizing the field sales force, sales analysis, forecasting and budgeting. Prereq: MKTG 3000 with a grade of C or higher.

Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4720 - Internet Marketing

Distinctly influences the way marketers conduct marketing activities. The Internet media promises to establish marketing theories, identifies obsolete situations, explores how marketing functions have irreversibly changed as a result of the internet, and outlines basic marketing strategies for successful online marketing. Prereq: MKTG 3000 with a grade of C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ENTP 4720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4730 - New Product Development

The creation of new products is essential in today's business environment. It is conducive to organizational growth and long-term survival. This course addresses the new product development process in depth. It introduces students to key concepts and issues. It also provides a series of practices which will help students deliver higher value and be more competitive. Prereq: MKTG 3000 with a C or higher. Restriction: Restricted to undergraduate Business majors at a junior standing or higher. Cross-listed with ENTP 4730. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4760 - Customer Relationship Management

This marketing-theory driven course examines customer relationship management (CRM) as a key strategic process for organizations. Composed of people, technology and processes, effective CRM optimizes the selection or identification, acquisition, growth and retention of desired customers to maximize profit. Besides presenting an overview of the CRM process, its strategic role in the organization and its place in marketing, students have an opportunity to create simulated CRM database using popular software package that help to illustrate what CRM can do, its advantages and limitations. Prereq: MKTG 3000. Cross-listed with ISMG 4760. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4780 - Preparing Business Plan

Turn a new business idea into a viable new business by developing a comprehensive business plan including: analysis of the potential demand for the product or service and potential customers; identify competitive advantages and marketing strategies; generate pro forma financial projections; and, design the management team needed. Prereq: ENTP 3000 AND either ENTP 3500 with a grade of 'C-' or higher or BLAW 4120 or ENTP 3120 with a grade of 'C' or higher. For non-business majors only. Can be applied to Entrepreneurship Certificate. Business majors enroll in either MGMT 4780 or MKTG 4780. Come to first class meeting with a carefully considered business idea. Cross-listed with MGMT 4780 and ENTP 3780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4800 - Marketing Seminar

Offered to provide consideration of a wide variety of topical issues in marketing, such as, services marketing, pricing, product development or creative marketing strategies. Prereq: MKTG 3000. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 4840 - Independent Study

Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 8 Credits.
Semester Hours: 1 to 8

MKTG 4950 - Special Topics

Courses offered on an irregular basis for the purpose of presenting new subject matter in marketing. Prerequisites vary depending upon the particular topic and instructor requirements. Restriction: Restricted to undergraduate Business majors with junior standing or higher. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MKTG 5939 - Internship

Supervised experiences involving the applications of concepts and skills in an employment situation. Prereq: 21 semester hours and 3.5 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MKTG 6010 - Marketing Strategy, Evaluation and Development

Focuses on marketing strategy and marketing planning. Addresses the formulation and implementation of marketing plans within the context of the overall strategies and objectives of both profit and not-for-profit organizations. There is heavy emphasis on group projects and presentations. Note: This course is intended to be taken near the end of your program. Prereq: BUSN 6560 completed with a C or better. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6020 - International Marketing

Explores problems, practices, and strategies involved in marketing goods and services internationally. Emphasized analysis of uncontrollable environmental forces, including cultures, governments, legal systems, and economic conditions, as they affect international marketing planning. Coreq: BUSN 6560. Note: students cannot receive credit for both MKTG 6020 and INTB 6026. Cross-listed with INTB 6026. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6030 - Sales and Sales Force Management

Focuses on issues in personal selling and managing the field sales force. Deals with organization sales analysis, forecasting, budgeting and operating, with particular emphasis on the selling task, recruiting, selection, training, compensation, supervision and motivation. Coreq: BUSN 6560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6040 - Services Marketing

Service industries such as health care, finance, information, entertainment, retailing, government, and professional services comprise 80% of the total employment and GDP of the US. Manufacturing firms increasingly look to value-added services to improve their bottom lines; yet customer satisfaction with services has been consistently lower than with goods. This course teaches students how to design and deliver high quality services, improve customer satisfaction, and thereby increase revenues and profitability. It also addresses how small, medium, and large firms can develop marketing plans and strategies in the new service environment. A variety of teaching methods may be used to demonstrate these concepts, such as cases, projects, field experiences, and/or guest speakers. Max hours: 3 Credits.
Semester Hours: 3 to 3

MKTG 6050 - Marketing Research

The objectives relate to effective marketing information management and include: (1) developing an understanding of the techniques and procedures that can be used to generate timely and relevant marketing information; (2) gaining experience in developing and analyzing information that is decision oriented; and (3) being able to make recommendations and decisions based on relevant and timely information. Computer analysis and projects are employed. Coreq: BUSN 6560 or 6530 or BANA 6610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6060 - Buyer Behavior

Why do consumers buy? How can marketing activities influence buyer behavior? Answers to these questions are key to marketing success & business fortune. In this course, we explore how to understand the heart & soul of consumers & examine the strategic implications of consumer psychology. Course participants conduct a market segmentation project that identifies & dissects various buyer groups within a chosen market. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6070 - Integrated Marketing Communications and Brand Identity

A brand's identity has a substantial influence on an organization's financial wealth. But brand identity is not simply the result of a great product or a creative ad. Utilizing many real examples, historic approaches, and current trends, this course explores how integrated marketing communications help build a brand identity that reverberates with consumers. Participants create an integrated marketing communications campaign. Coreq: BUSN 6560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6080 - Marketing in Emerging Markets

Explores problems, practices and strategies involved in marketing goods and services in emerging markets. Emphasizes analysis of uncontrollable environmental forces, including cultures, government, legal, systems and economic conditions as they affect marketing planning. Coreq: BUSN 6560. Note: students cannot receive credit for both MKTG 6080 and INTB 6082. Cross-listed with INTB 6082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6090 - Customer Relationship Management

Involves the management of customer relationships to maximize customer service and its associated benefits at minimal cost. Includes services marketing concepts and techniques, IT applications, and software. Designed to acquaint students with practices and issues in state-of-the-art customer relationship management systems in an array of different types of organizations. The course initially focuses on the nature of customer relationship management (CRM) the interaction between strategic management planning, corporate culture and CRM. Other topics examined include successful models of CRM, managing the employee or CRM interface, marketing research, and CRM, and customer trust, loyalty, CRM customer service levels, customer service levels, customer profitability or metrics, selecting and integrating CRM software, CRM integration and timing of CRM roll-out. Coreq: BUSN 6560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6091 - Strategic Product Marketing

Familiarizes students with key theories and practices regarding products. Successful development of a new product, or

extending the life cycle of an existing product. Outlines and necessitates the understanding of product development, key concepts related to successful product management over the course of its life cycle including the way the product function adds synergy to other marketing activities and, in turn, benefits from them. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6092 - Social Media Marketing

Explores how the marketing function has irreversibly changed as a result of the internet and to lay out basic marketing strategies for successful online marketing. Coreq: BUSN 6560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6094 - Marketing Issues in the Chinese Environment

This course assesses numerous marketing and marketing related topics in the Chinese environment with the objective of helping the graduate student develop managerial and marketing expertise. In specific, the course pinpoints key developments in the Chinese business environment, develops expertise in conducting market opportunity analysis, assesses market entry conditions and strategies and applies marketing mix strategies in the context of the Chinese environment. Note: It is recommended for students to take BUSN 6560 or INTB 6000 prior to this course. Cross-listed with INTB 6094. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6200 - Marketing Metrics and Dashboards

Dashboards help us monitor the functioning of various systems by displaying real-time process or outcome metrics. In the past, such indicators were often not available until the end of a period, which made them more "post-mortems" than management tools. Operating from a solid theoretical foundation, this class attempts to serve the needs of two groups, namely, marketing professionals with a review of the types of metrics that could be included on their dashboards, as well as professionals from other functional disciplines with insights into what various marketing metrics mean and illustrating the types of marketing decisions they inform. This is a quantitative class that focuses on developing and understanding marketing performance measures; however, it does not require you to build a dashboard nor does it require you to have advanced math skills. Coreq: BUSN 6560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6700 - Marketing Travel Study

This is a 2-week travel course, designed to focus on the marketing of the specific country we visit. In the past the travel course has been to Spain and Costa Rica, but the country of destination may be different every time (usually offered every other year). While in the country, students will visit companies (such as advertising agencies, marketing research firms, local grocery stores, marketing departments of multinational corporations, etc.), have lectures/discussions on marketing in that country and work on a marketing plan for a local company or not-for-profit organization. Prereq: BUSN 6560 with a C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6800 - Topics in Marketing

Courses offered irregularly for the purpose of presenting new subject matter in marketing. Consult the current 'Schedule Planner' for semester offerings. Prereq: BUSN 6560. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MKTG 6820 - Sports & Entertainment Marketing

This course focuses on techniques for formulating marketing plans for various types of sports organizations. The course deals with marketing issues particularly germane to sports organizations such as: fans as consumers, fan loyalty, sports pricing, servicescapes, player development and sports sponsorships. This course includes lectures, guest speakers, cases, examinations and student group projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6830 - Marketing & Global Sustainability

Marketing & Global Sustainability focuses on the role of marketing in sustainable for-profit and not-for-profit companies from a global perspective. The course examines sustainable business practices and trends; green brands, green labels, and greenwashing; socially-conscious and "green" customer segments; innovating for sustainable new products and services; sustainable retailing and supply chains; and sustainability as a competitive advantage. The course will employ a variety of pedagogical techniques including lectures, discussion, guest speakers, case studies, and projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MKTG 6840 - Independent Study

Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Prereq: Permission of instructor. Max hours: 8 Credits. **Semester Hours:** 1 to 8

MLNG 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

MLNG 1995 - Travel Study Abroad

Entry-level language and cultural instruction in country of target language. Focuses on vocabulary and grammar to teach students to express themselves in everyday situations. A basic knowledge of the language and culture will be developed through listening, reading, writing and speaking. The classes will be taught primarily in the target language and will be supplemented by cultural excursions. Max hours: 15 Credits. **Semester Hours:** 1 to 15

MLNG 2939 - Internship

Max hours: 3 Credits. **Semester Hours:** 1 to 3

MLNG 4690 - Methods of Teaching Modern Languages

Methodology of teaching foreign language in an urban setting. Note: Requirement for language majors in the teacher certification program, School of Education, CU-Denver. Cross-listed with MLNG 5690. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MLNG 4691 - Methods of Teaching Modern Languages II

A continuation of the study of modern language teaching methods. This second course has an emphasis on experiential learning through individual teaching demonstrations, class observations, as well as team teaching with experienced instructors. Prereq: MLNG 4690. Cross-listed with MLNG 5691. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MLNG 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MLNG 5690 - Methods of Teaching Modern Languages

Methodology of teaching foreign language in an urban setting. Requirement for language majors in the teacher certification program, School of Education, CU-Denver. Cross-listed with MLNG 4690. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MLNG 5691 - Methods of Teaching Modern Languages II

A continuation of the study of modern language teaching methods. This second course has an emphasis on experiential learning through individual teaching demonstrations, class observations, as well as team teaching with experienced instructors. Prereq: MLNG 5690. Cross-listed with MLNG 4691. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MLNG 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

MSRA 5000 - Introduction to Graduate Studies

Surveys existing literature and research in science, technology, and pedagogy of recording arts. Extensive use of available resources in library, electronic and print, trade and scientific publications are explored. Use of computer applications for research and publication are developed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5001 - MSRA Research Seminar

In preparation for their thesis/portfolio, students learn research techniques by: applying skills from MSRA 5000, learning research design, performing research, interpreting results, and writing. Students will discover opportunities to add to the body of audio literature and recording techniques. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5004 - Topics in Media Forensics

Students learn theory and application through topical subjects designed to enhance theoretical and practical training in the analysis of forensic media. Emphasis will be placed on emerging technologies, methodological developments, and strengthening fundamental skills. These courses are repeatable for credit. Max hours: 5 Credits. **Semester Hours:** 1 to 3

MSRA 5014 - Research Practices in Media Forensics

An introduction to practical research techniques and forensic science periodicals provides students with a foundation for projects and reports in subsequent classes and for the research thesis. Library resources, research design, writing styles, and information technology will be discussed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5054 - Experiential Lab

Students will understand laboratory procedures and the application of A/V technology in the field and in analysis through professional conferences and site visits to crime labs and government agencies. Students will respond to experiences regarding presentation, demonstration, and discussion components. Max hours: 5 Credits. **Semester Hours:** 1 to 1

MSRA 5114 - Foundations in Media Forensics

Students learn the foundational processes integral to forensic audio, video, and image analysis demonstrating knowledge through reading responses and documentation of procedures and methodology used in assigned projects. Topics include: media recording technology, analog/digital theory, multimedia compression, and equipment characterization. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5124 - Forensic Science and Litigation

Critical analysis of legal precedent and court proceedings reveal to students the correlation between science and law in the litigation of forensic evidence. Assigned reading and research papers regarding evidence admissibility and scientific methodology will prepare students for evidence examination. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5134 - Computer Forensics

Students explore computer forensics through guided projects and group discussion. An overview of computer hardware/software and characterization of storage media and file types will be covered through mock evidence examination documenting the search, seizure, and acquisition of forensic media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5144 - MATLAB Foundations

An introduction to MATLAB workflow and its use in Media Forensics will be explored. Students will learn how to build program commands in scripts for signal analysis and to display graphical representations of data and statistics. Max hours: 2 Credits. **Semester Hours:** 2 to 2

MSRA 5214 - Forensic Audio Analysis

Students learn concepts through the application of techniques related to audio enhancement, digital media authentication, acoustic analysis, and automatic speaker recognition. The acquisition and analysis of digital evidence applying reliable methods prepares students for forensic audio analysis in the laboratory. Max hours: 3 Credits.

Semester Hours: 3 to 3

MSRA 5224 - Forensic Video and Image Analysis

Students learn concepts through the application of techniques related to forensic video collection and image enhancement, authentication, photogrammetry, and comparison. The acquisition and analysis of digital evidence applying reliable methods prepares students for working on forensic imagery in the laboratory. Max hours: 3 Credits.

Semester Hours: 3 to 3

MSRA 5244 - Mobile Phone Forensics

Students learn concepts regarding the proper handling of mobile phones to ensure evidence integrity and approaches to address the ever-changing field. Students are prepared for the acquisition and analysis of forensic media on personal devices through exercises and group projects. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MSRA 5254 - MATLAB for Forensic Audio Analysis

Advanced application of MATLAB for the forensic analysis of audio will be presented including file access, FFT and waveform plotting, and signal detection. Through the exploration of correlation and using mean quadratic difference students will be prepared for media authentication. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MSRA 5264 - MATLAB for Forensic Video and Image Analysis

Advanced application of MATLAB for the forensic analysis of images will be presented covering image processing and analysis techniques. Through exploring analyses such as Photo Response Non-Uniformity and the BI-Dimensional DFT, students are prepared for image authenticity examinations. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MSRA 5314 - Report Writing and Court Testimony

Students are prepared for expert witness testimony through the analysis of mock evidence, complimentary report preparation, and subsequent mock trial. This capstone experience will demonstrate a student's technical writing and presentation skills and exercise the creation of demonstrative materials. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5500 - Topics in Professional Audio

Selected topical subjects to include live or studio sound recording, sound reinforcement, new technologies or practices in the audio industry. Max hours: 9 Credits. **Semester Hours:** 1 to 1

MSRA 5505 - Audio Post Production I

Reviews all aspects of audio synchronized with picture, including music, sound effects, narration, and dialog replacement. Topics studied with respect to film, video and multi-media. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5510 - Topics in Recording Arts

Selected topical subjects to include live or studio sound recording, sound reinforcement, new technologies or practices in the audio industry. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5515 - Songs and Scores in Visual Media

An introduction to the concepts involved in composing music for film, television, and other visual media. To acquaint aspiring musicians filmmakers with the use of music in films. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5530 - Live Sound Reinforcement

This course focuses on the basic elements of sound reinforcement: acoustics, equalization, equipment and mixing techniques. The major emphasis is the production of the final sonic product. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5550 - Audio Production III

Advanced studies in sound recording and reinforcement, aesthetics and techniques of multi-track analog and digital recording and stereo imaging. Team lab recording projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5560 - Mastering & Advanced Digital Audio

A study and practice of the art of mastering. Topics covered include: history, monitoring, signal flow, metering, jitter, audio restoration, limiting, creating a CD pre-master, & mastering for new media. Students will get practical experience mastering their own projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5575 - Graduate Surround Sound

This lecture-lab course deals with surround sound in film, digital TV and DVD's. Topics include monitoring, microphone techniques, recording, mixing, mastering, delivery formats and psychoacoustics. Students work on two lab projects in the semester. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5576 - Surround Sound II

Students will work on advanced surround sound projects and study mixing aesthetics, high-definition technology and authoring. Students will have advanced knowledge of these topics and produce professional, competitive material for

their demo. Prereq: MSRA 5550, 5575 and 5505, or permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MSRA 5580 - Graduate Audio Seminar I

Faculty and majors of the music engineering program assemble to discuss and demonstrate issues of artistic and technical applications of recording technology. Student projects, faculty, and guest lectures provide topical focus. Max hours: 6 Credits. **Semester Hours:** 3 to 3

MSRA 5581 - Graduate Audio Seminar II

Capstone project based course in which students complete professional quality projects in music production and/or post production. Students refine their engineering skills and develop new skills required for integration in the music industry such as portfolio design and resume development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5590 - Graduate Audio Production

Deals with advanced audio skills for music recording, including technical and artistic considerations. This is a required course for the MSRA degree. Max hours: 4 Credits. **Semester Hours:** 3 to 3

MSRA 5600 - Topics in Music

Various topics relating to the study of music performance, music technology and music business. Max hours: 9 Credits. **Semester Hours:** 1 to 3

MSRA 5605 - Audio Post Production II

Students will learn advanced Pro Tools techniques by designing, conceptualizing, and completing sound for a student film project. This interdisciplinary course prepares students for working relationships between Recording Arts, Film and Video areas and an entry level job in post production. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5820 - Digital Music Techniques

Studies the general principles and applications of digital music technology, emphasizing the function and operation of specific computer software. Topics include digital audio workstations, MIDI sequencers, digital signal processing programs, and distribution on optical discs and computer-based mediums. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 5840 - Independent Study for MSRA

Allows graduate students to pursue in-depth study of an audio-related topic, to be discussed with and approved by the Graduate Advisor. A final report or other tangible results will be determined on a case- by-case basis. Max hours: 3 Credits. **Semester Hours:** 1 to 3

MSRA 6214 - Forensic Audio Analysis

Students learn concepts through the application of techniques related to audio enhancement, digital media authentication, acoustic analysis, and automatic speaker recognition. The acquisition and analysis of digital evidence applying reliable methods prepares students for forensic audio analysis in the laboratory. Coreq: MSRA 6254 and admittance to Certification in Forensic Audio Analysis Program required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 6224 - Forensic Video and Image Analysis

Students learn concepts through the application of techniques related to forensic video collection and image enhancement, authentication, photogrammetry, and comparison. The acquisition and analysis of digital evidence applying reliable methods prepares students for working on forensic imagery in the laboratory. Coreq: MSRA 6264 and admittance to Certification in Forensic Video and Image Analysis Program required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 6254 - MATLAB for Forensic Audio Analysis

Advanced application of MATLAB for the forensic analysis of audio will be presented including file access, FFT and waveform plotting, and signal detection. Through the exploration of correlation and using mean quadratic difference students will be prepared for media authentication. Coreq: MSRA 6214 and admittance to Certification in Forensic Audio Analysis Program required. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MSRA 6264 - MATLAB for Forensic Video and Image Analysis

Advanced application of MATLAB for the forensic analysis of images will be presented covering image processing and analysis techniques. Through exploring analyses such as Photo Response Non-Uniformity and the Bi-Dimensional DFT, students are prepared for image authenticity examinations. Coreq: MSRA 6224 and admittance to Certification in Forensic Video and Image Analysis Program required. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MSRA 6510 - Graduate Audio Studies Pedagogy

Surveys available resources for audio education. Interdisciplinary materials in physics, acoustics, engineering, music, broadcast, medicine, psychology, multi-media, theater, and film or video are reviewed. Emphasis on design and development of new methods and materials are pursued. (MSRA graduate students only.) Prereq: MUSC 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MSRA 6550 - Sound Design

Deals with designing sound for live theater, film, video, television, theme parks, games and soundscapes. Focuses on using technology to achieve specific esthetic aspects of audio production. This is accomplished through lectures, listening assignments, research and lab practice. (For graduate students only.) Max hours: 4 Credits. **Semester Hours:** 4 to 4

MSRA 6950 - Thesis in Professional Audio

With the guidance of a thesis advisor, each candidate for the MSRA degree select an approved topic for scholarly review, research and publication. The approved materials are evaluated for written and oral defense. Prereq: MUSC 5000, 5590, 6510, 6580, 6530. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MSRA 6951 - Professional Audio Portfolio Thesis

With the guidance of a portfolio advisor, each candidate for the MSRA degree produce specified documentation and audio materials that reflect the career intentions of the candidate. A completed "Show kit" or professional "Demo" of the candidate's specialty are produced. The approved materials are evaluated for written, audio and oral defense. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MSRA 6954 - Research Thesis in Media Forensics

Students work closely with their thesis advisor in selecting a topic for original research and scientific publication. This capstone project creates an area of specialty for MSRA-MF degree candidates. Approved materials are evaluated through report submission and oral defense. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MTAX 6400 - Taxation of Corporations and Shareholders

A study of federal income tax problems of corporations and corporate shareholders. The course addresses introductory corporate tax issues found in Subchapter C of the Internal Revenue Code including defining a "corporation" for federal income tax purposes, tax consequences associated with the formation of a corporation, taxation of corporate operations (including an analysis of the differences that exist between earnings and profits, dividend distributions and taxable income), corporate redemption transactions, partial liquidations, complete liquidations and the acquisition, sale and disposition of corporate entities in transactions governed by Section 336(e) and 338 of the Internal Revenue Code. Prereq: ACCT 4410 or 6140 with a grade of C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6405 - Tax of Property Transactions

This course focuses on the fundamental concepts regarding the taxation of transactions involving property including concepts such as: basis of property; realization and recognition of gain or loss; effects of taxing gains and losses from capital assets; depreciable status; amortization of intangible property; depreciation methods; property casualties and losses; limitations on passive losses; and non-recognition transactions. Prereq: ACCT 6140 or ACCT 4410 or at least 6 semester hours of MTAX courses. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6410 - Advanced Tax For Individuals

Advanced federal income tax course stressing the use of the Internal Revenue Code, Treasury regulations, case law, and administrative guidance to resolve federal income tax issues affecting individuals. Topics: items of gross income inclusion/exclusions, deductions, items of non-recognition, characterization of income, and tax rates. Prereq: Grade of

C (2.0) or higher in ACCT 6140 or ACCT 4410. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6420 - Estate and Gift Taxes

Introduction to principles and practices associated with the taxation of estates, gifts, and other gratuitous transfers under Subtitle B of the Internal Revenue Code. Using relevant examples, this course also focuses on the practical aspects of completing IRS Form 706, United States Estate (and Generation-Skipping Transfer) Tax Return, and IRS Form 709, United States Gift (and Generation-Skipping Transfer) Tax Return. Prereq: ACCT 6140 or ACCT 4410 or at least 6 semester hours of MTAX courses. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6425 - Taxation of S Corporations and Their Shareholders

This class will focus on fundamental tax issues relating to S corporations and their shareholders arising from the formation, operation, and liquidation of S corporations. Course work includes an examination of pertinent federal income tax returns of an S corporation. Prereq: MTAX 6400. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6430 - International Taxation

International taxation focuses on the U.S. taxation of cross-border transactions. A review of the Internal Revenue Code's basic international tax rules is covered, including residency rules, sourcing of income and expenses, taxation of in-bound transactions (FDAP and effectively connected income rules), overview of U.S. model tax treaty provisions, anti-deferral regimes, and foreign tax credits. Students are often required to study the tax regimes of another country to compare and contrast foreign tax laws to U.S. laws. A brief review of interest-charge domestic international sales corporations is often covered. Prereq: Grade of C (2.0) or higher in ACCT 6140 or ACCT 4410. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6440 - Tax Practice and Procedures

A study of the organization, policies, and procedures of federal and state taxing authorities. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6450 - Research Problems In Taxation

This course provides a study of various methodologies used in tax research and tax planning, together with a study of some aspects of tax administration and tax practice, of the legislative procedures regarding proposed revisions of the current tax law, and of the administrative rules and tax penalties applicable to accountants, lawyers, and tax return preparers in practicing before the Internal Revenue Service and providing tax return advice and preparation. In particular, this course explores techniques (with an emphasis on electronic/on-line techniques) for locating and researching judicial cases, statutory legislative histories, and administrative materials promulgated by the Internal

Revenue Service applicable to tax-related issues and problems. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6455 - Tax Aspects Relating to Exempt Organizations

This course focuses on the statutory exemptions for "charities," social welfare and social clubs, mutual or cooperative companies, business and professional leagues, labor unions, exempt organizations, federally organized or chartered organizations, and other entities organized under IRC section 501(c). It also addresses the political campaign activities, funds, and lobbying activities of political organizations and entities organized under IRC section 501(c); the "prohibited transactions" rules; private foundations; the "unrelated business income" tax; the dissolution of, and distribution of assets held by, exempt organizations; and the charitable contribution. Prereq: Grade of C (2.0) or higher in ACCT 6140 or ACCT 4410. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6460 - Advance Topics in Taxation

Course will focus on a variety of advanced tax topics for closely held businesses and individuals. Format: Lectures by expert tax professionals and questions/discussion on various topics with emphasis on current issues and trends. Prereq: Grade of C (2.0) or higher in ACCT 6140 or ACCT 4410. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6465 - State and Local Taxation

This course focuses on the constitutionality of certain taxable transactions, privilege taxes, discriminatory tax regimes, and multiple taxation under the Commerce Clause of the United States Constitution; taxation based on class and the Equal Protection Clause of the United States Constitution; nexus or jurisdictional tax due process; allocation and apportionment formulae under various state and local tax regimes; business versus nonbusiness income; the multi-state tax compact; the "unitary" concept; residency definitions; nonresident income sources; sales of tangible personal property and their taxation under various state and local tax regimes; retail and wholesale sales; taxable and nontaxable leases; valuation techniques for real and personal property for purposes of certain state and local property taxes; and administrative procedures applied by various state and local tax jurisdictions. The main portion of the class analyzes the various types of sales and use taxes imposed by 46 states. In this regard, the course focuses on the impact of sales and use taxes on selected transactions, including interstate purchases and sales, drop shipments, purchases from and sales to state and federal governments, occasional or "casual" sales, leasing transactions, and construction and manufacturing transactions. Finally, the course provides an overview of current state and local tax developments, including the Streamlined Sales Tax Project. Max hours: 3 Credits. **Semester Hours:** 0 to 0

MTAX 6470 - Professional Judgment and Ethical Decisions in Tax

A tax accounting practice involves the preparation of tax returns and the providing of tax advice to clients in structuring and implementing business transactions. Ethical considerations, mandates of the Internal Revenue Service, and penalties under the Internal Revenue Code govern the tax accountant's providing of tax advice to his or her clients. This course focuses on those ethical considerations, mandates, and penalties, with an emphasis on identifying and resolving ethical conflicts and dilemmas in a case-oriented context; on IRS publication Circular 230; on tax penalties under IRC Code sections 6662, 6664, 6694, 6695, and 6696; and on the standards governing the issuance of tax opinions to clients. In addition, participants learn to apply a structured decision model, incorporating critical, creative, evaluative and reflective judgment processes and learn how to recognize and avoid common decision errors and biases. Note: A grade of C or higher must be earned to receive credit for the CPA license. Restriction: Restricted to graduate business

majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits.

Semester Hours: 3 to 3

MTAX 6475 - Accounting for Income Taxes

This course addresses financial accounting reporting standards for income taxes. Principal topics include understanding financial statement disclosures, identification of permanent and temporary differences, and calculation of current and deferred tax provisions. Additional topics include uncertain tax positions, valuation allowances, and considerations of international business operations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6480 - Partnership Taxation

Fundamentals of the Taxation of Partnerships and Partners. This class will focus on fundamental tax issues relating to partnerships and partners arising from the formation, operation, and liquidation of partnerships. Course work includes an examination of pertinent federal income tax returns of the partnership. Prereq: Grade of C (2.0) or higher in ACCT 6140 or ACCT 4410. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6482 - Advanced Partnership Taxation

Advanced federal income tax course focusing on the taxation of partnerships and their partners. Topics: "substantial economic effect", allocation of debt to partners' bases, "hot assets", profits interests, related-party transactions, distribution "waterfalls", profit and loss allocation "waterfalls", and taxation of retiring partners. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6490 - Income Tax of Trusts, Estates, and Beneficiaries

There are five major income tax areas that are fundamental to a CPA or legal tax practice: (1) individual; (2) partnership; (3) C corporations; (4) S corporations; and (5) "fiduciary" taxation. This course focuses on the last of the core types of income taxation – fundamentally, the taxation of trusts, estates and their beneficiaries under Subchapter J of the Internal Revenue Code. There are three major areas covered by Subchapter J. First, the grantor trust rules deal with revocable trusts and, to many practitioner's surprise, many irrevocable trusts. Second, estates and irrevocable trusts that are not grantor trusts are governed by the distributable net income rules. Third, when someone inherits an asset that was not taxed to the decedent, such as a retirement plan, the income in respect of a decedent rules apply to the heir. This course examines each of these three major areas of income taxation under Subchapter J and focuses on the practical aspects of completing IRS Form 1041, U.S. Income Tax Return for Estates and Trusts, using real life examples. Prereq: ACCT 6410 or ACCT 4410 or at least 6 semester hours of MTAX courses. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6495 - Travel Study: Washington, D.C. Tax Experience

This class will be a travel program. Students will travel to Washington, D.C. to meet with representatives from the various governmental entities that influence a federal income tax practice. In particular, students will meet with representatives from the various Congressional committees and legislative advisory committees involved in drafting tax

legislation, from the Internal Revenue Service and Treasury Department, and from the United States Tax Court and other courts that consider federal tax cases. Prereq: At least 6 semester hours of MTAX courses. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 2 Credits. **Semester Hours:** 2 to 2

MTAX 6500 - Advanced Corporate Taxation

A study of the statutory and judicial tax rules and problems relating primarily to corporate reorganizations, commonly controlled corporations, and consolidated tax returns, with a special emphasis on the tax rules associated with restructuring of corporate entities in the context of corporate merger and acquisition transactions. Prereq: ACCT 6140 or ACCT 4410 or equivalent and ACCT/MTAX 6400 all with a grade of C or higher. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTAX 6840 - Tax Independent Study

Permission of instructor required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Prereq: At least 6 semester hours of MTAX courses. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 1 to 3

MTAX 6939 - Tax Internship/Cooperative Education

Supervised experiences involving the application of tax return preparation and tax planning concepts and skills in an employment situation. Prereq: At least 6 or more semester hours of MTAX courses. Restriction: Restricted to graduate business majors and NDGR majors with a sub-plan of NBA or CPA within the Business School. Max hours: 3 Credits. **Semester Hours:** 1 to 3

MTED 4002 - Elementary Mathematics Teaching I

Prepares elementary teachers to teach mathematics to PreK-6 students while applying principles of the National Council of Teachers of Mathematics to mathematical learning. Teachers explore ways to help all elementary students become flexible and resourceful mathematical problem solvers. Cross-listed with MTED 5002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 4003 - Elementary Mathematics Teaching II

Develops the mathematical and pedagogical understandings and competence of elementary teachers, focusing on instructional assessment, principles, and practices. Cross-listed with MTED 5003. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 4300 - Curriculum and Methods for Teaching Mathematics

Fosters teachers' use of task-based mathematics pedagogy, including orchestrating students' mathematical discourse, to develop mathematics classrooms in which the teacher builds from students' current understandings, accommodates for

students' differences, and has high expectations for all students. Cross-listed with MTED 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 4301 - Assessment and Equity in Mathematics Instruction

Examines mathematics assessment and equity from both a teacher's and a student's perspective. Focuses on assessment as a process, during which a teacher gathers evidence of students' mathematical knowledge and understanding and then uses that evidence to make instructional decisions. Prereq: Concurrent enrollment in an internship or permission of instructor. Cross-listed with MTED 5301. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5002 - Elementary Mathematics Teaching I

Prepares elementary teachers to teach mathematics to PreK-6 students while applying principles of the National Council of Teachers of Mathematics to mathematical learning. Teachers explore ways to help all elementary students become flexible and resourceful mathematical problem solvers. Cross-listed with MTED 4002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5003 - Elementary Mathematics Teaching II

Develops the mathematical and pedagogical understandings and competence of elementary teachers, focusing on instructional assessment, principles, and practices. Cross-listed with MTED 4003. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5030 - Theories Of Mathematics Learning

Develops educators' knowledge of foundational theories and conceptual frameworks in mathematics education. MTED 5030 and 7030 are cross-listed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5040 - Mathematics Teaching - Theory and Practice

Develops educators' research-based understandings and practices of PreK-12 mathematics teaching and learning. MTED 5040 and 7040 are cross-listed. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MTED 5050 - Critique Of Mathematics Education Research

Develops educators' understanding of various research studies in mathematics education, including research focusing on mathematics teaching and learning, attending to students' mathematical reasoning, and teaching mathematics for social justice and equity. Increases educators' competence, confidence and enthusiasm in critiquing research. MTED 5050 and 7050 are cross-listed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5060 - Developmental Pathways In Students' Mathematical Thinking

Fosters educators' development of research-based ways of determining (a) what to look for, (b) how to look for, (c)

how to synthesize and report on, and (d) how to incorporate in pedagogy data-grounded inferences about children's mathematical thinking. MTED 5060 and 7060 are cross-listed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5300 - Curriculum and Methods for Teaching Mathematics

Fosters teachers' use of task-based mathematics pedagogy, including orchestrating students' mathematical discourse, to develop mathematics classrooms in which the teacher builds from students' current understandings, accommodates for students' differences, and has high expectations for all students. Cross-listed with MTED 4300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5301 - Assessment and Equity in Mathematics Instruction

Examines mathematics assessment and equity from both a teacher's and a student's perspective. Focuses on assessment as a process, during which a teacher gathers evidence of students' mathematical knowledge and understanding and then uses that evidence to make instructional decisions. Prereq: Concurrent enrollment in an internship or permission of instructor. Cross-listed with MTED 4301. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5400 - Mathematics for Elementary Teachers

Key mathematical concepts for K-6 teachers informed by NCTM & Common Core State Standards, such as place-value number systems, rational, proportional, & algebraic reasoning, geometrical concepts, & statistical/probability ideas. Students' meaningful, enjoyable learning is promoted via problem solving activities. Cross-listed with MATH 3040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5619 - Expanding Conceptions of Number: Quantity and Operation

Teachers' learning will focus on quantities and operations in place value number systems, how students understand such systems, and how teaching may promote students' progress. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5620 - Developing Fractional & Proportional Reasoning

Teachers' learning will focus on quantities and operations involved with ratio, fraction, and proportion; and on how students understand ratio, fraction and proportion; and how teaching may promote students' progress. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5621 - A World of (Different) Numbers: Quantity and Operation

Develops K-12 teachers' understanding of number systems and the ability to foster students' understanding. Focuses on number, quantity, and operation. Applicable to teaching students at all grade levels in line with the K-12 Common Core Standards. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5622 - Expanding Conceptions of Algebra

Develops K-12 teachers' understanding of algebra concepts and the ability to foster students' understanding. Focuses on equivalence, variable, covariation, and function. Applicable to teaching students at all grade levels in line with the K-12 Common Core Standards. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 5623 - Geometrical Ways Of Reasoning

Develops K-12 teachers' geometrical reasoning and the ability to foster students' reasoning. Addresses transformation, measurement, classification, objects, imagery, formulas, and investigation. Applicable to teaching students at all grade levels in line with the K-12 Common Core Standards. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 7030 - Theories Of Mathematics Learning

Develops educators' knowledge of foundational theories and conceptual frameworks in mathematics education. MTED 5030 and 7030 are cross-listed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 7040 - Mathematics Teaching - Theory and Practice

Develops educators' research-based understandings and practices of PreK-12 mathematics teaching and learning. MTED 5040 and 7040 are cross-listed. Max hours: 9 Credits. **Semester Hours:** 3 to 3

MTED 7050 - Critique Of Mathematics Education Research

Develops educators' understanding of various research studies in mathematics education, including research focusing on mathematics teaching and learning, attending to students' mathematical reasoning, and teaching mathematics for social justice and equity. Increases educators' competence, confidence and enthusiasm in critiquing research. MTED 5050 and 7050 are cross-listed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MTED 7060 - Developmental Pathways In Students' Mathematical Thinking

Fosters educators' development of research-based ways of determining (a) what to look for, (b) how to look for, (c) how to synthesize and report on, and (d) how to incorporate in pedagogy data-grounded inferences about children's mathematical thinking. MTED 5060 and 7060 are cross-listed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 2450 - Performing Arts Management and Presentation

Introduces students to nonprofit and for-profit arts organization issues in performance presentation including organization structure, performance production and management, development of leadership and organizational skills as well as a general understanding of the profession. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 2540 - Audio Production I

Operating principles and performance characteristics of microphones, amplifiers, speaker systems, equalizers, mixers and multi-track recorders; acoustics of music, auditoriums and recording studios. Prereq: MUSC 2700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 2560 - Audio Production II

Studies include theoretical and practical music production techniques with topics covering digital audio workstations, signal flow, digital signal processing, MIDI production, synthesis, and sampling. Team lab recording projects involve recording, mixing, and other music production techniques. Prereq: MUSC 2540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 2700 - Introduction to Music Business

Introduces music as a business and a product, emphasizing music publishing, recording, broadcasting, marketing, licensing and legal aspects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 2815 - Music Industry Topics

Various topics related to music business and recording arts industries. Max hours: 12 Credits. **Semester Hours:** 3 to 3

MUSC 3125 - Sound and Music for Video Games

This course will give students an overview of the function of sound and music for video games including: history, sound engines, types of audio utilized, stereo and surround sound localization, music capabilities of hardware configurations and future trends in sound for video games. Prereq: MUSC 2540 and MUSC 2470 or permission of instructor. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MUSC 3210 - Music and Entertainment Marketing

In this course students learn the essential elements of marketing as applied to the music and entertainment industry. Course topics include: marketing principles, theories and tools utilized in the music and entertainment businesses and specific industry practices and applications. Prereq: MUSC 2700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3220 - Artist Management

Students learn the theory and practice of artist management as it relates to developing a career through entrepreneurship, establishing business structures for the artist, and concepts including: promotion, live performance, recording, contracts, and essential business practices. Prereq: MUSC 2700 Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3550 - Critical Listening for Recording Arts

Students will be trained to recognize: boosts and cuts in different bands of frequencies at increasingly small increments, types of distortion, parameters for compression, delay, reverb and stereo imaging. Students will develop a vocabulary for describing sounds and improving auditory memory. Prereq: MUSC 2560 and PHYS 3620. Coreq: MUSC 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3615 - Topics In Music Business

Various topics relating to the study of music business. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3690 - Concert Promotion, Tour, and Venue Management

This course gives students a working knowledge of touring, presenting, promoting, marketing and management of live concerts. They will undertake an in-depth analysis from various points of reference: issues for agent, independent promoter, venue manager, tour/production manager and performer. Prereq: MUSC 3210 and MUSC 3220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3700 - Music and Entertainment Business in the Digital Age

In this course students learn the trends and developments changing the industry in the Digital Age. Course focuses on current technology, terminology and business models shaping the industry, preparing students for entry into an evolving music and entertainment career. Prereq: MUSC 3210 and 3220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3710 - CAM Records

Provides students with an opportunity to use knowledge and skills from music business courses to create and execute initiatives while partnering with local artists and music-related entities for a hands-on learning experience that benefits the student and local music community. Prereq: MUSC 3210 and 3220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3715 - Music Business Modules

Modular courses intended to expose students to specific business and management aspects of various subindustries within the music industry.. Prereq: MUSC 3690. Max hours: 1 Credit. **Semester Hours:** 1 to 1

MUSC 3720 - Law and the Music Industry

Students will learn how to use and analyze music law principles through a review of essential court case studies. Students will be tested on lecture material and provided with an opportunity to complete research papers for a more in-depth examination. Prereq: MUSC 3690, 3700, 3710 and 3755. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3755 - Music Publishing

Students will learn key issues related to music publishing and song marketing activities, as well as the function and responsibilities of music publishers. Students will gain insight into skills needed to operate a music publishing company. Prereq: MUSC 3210 and 3220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3785 - Current Issues In the Music Business

Class discusses and analyzes cutting-edge business and legal developments in the music industry, focusing particularly on the developments' impact on historical traditions, career paths and creative applications in the field. Prereq: MUSC 3690. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 3790 - Video Production in the Arts: Music

Introduces the development of the contemporary music video with an emphasis on stylistic and technical analysis. Combines a lecture demonstration format with hands-on videography. Open to music, theatre, fine arts majors, and students who have successfully completed at least one College of Arts and Media course. Max hours: 4 Credits. **Semester Hours:** 4 to 4

MUSC 3939 - Internship

Max hours: 12 Credits. **Semester Hours:** 1 to 3

MUSC 4100 - Advanced Composition

Composition of extended forms. May be repeated once for credit. Prereq: MUSC 3200. Max hours: 2 Credits. **Semester Hours:** 2 to 2

MUSC 4500 - Topics in Professional Audio

Selected topical subjects to include live or studio sound recording, sound reinforcement, new technologies or practices in the audio industry. Prereq: MUSC 4550. Cross-listed with MSRA 5500. Max hours: 9 Credits. **Semester Hours:** 1 to 1

MUSC 4505 - Audio Post Production I

Reviews all aspects of audio synchronized with picture, including music, sound effects, narration, and dialog replacement. Topics studied with respect to film, video and multi-media. Prereq: MUSC 4560. Coreq: MUSC 4580. Cross-listed with MSRA 5505. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4510 - Topics in Recording Arts

Selected topical subjects to include live or studio sound recording, sound reinforcement, new technologies or practices in the audio industry. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4515 - Songs and Scores for Visual Media

This survey of music in film and television will create a better understanding of the process between filmmakers and composers and will acquaint aspiring filmmakers and musicians with concepts of film theory, the creative use of film music, and the pragmatic aspects of organizing scoring sessions and procuring music rights. Prereq: FITV 2050 or MUSC 2560. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4530 - Live Sound Reinforcement

This course focuses on the basic elements of sound reinforcement: acoustics, equalization, equipment and mixing techniques. The major emphasis is the production of the final sonic product. Prereq: MUSC 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4550 - Audio Production III

Advanced studies in sound recording and reinforcement, aesthetics and techniques of multi-track digital recording and stereo imaging. Team lab recording projects. Prereq: MUSC 2560 and PHYS 3620. Coreq: MUSC 3550. Cross-listed with MSRA 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4560 - Mastering & Advanced Digital Audio

A study and practice of the art of mastering. Topics covered include: history, monitoring, signal flow, metering, jitter, audio restoration, limiting, creating a CD pre-master, & mastering for new media. Students will get practical experience mastering their own projects. Prereq: MUSC 3550 and MUSC 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4575 - Surround Sound

This lecture-lab course deals with surround sound in film, digital TV and DVDs. Topics include monitoring, microphone techniques, recording, mixing, mastering, delivery formats and psychoacoustics. Students work on two lab projects in the semester. Prereq: MUSC 4505. Cross-listed with MSRA 5575. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4580 - Audio Production Seminar I

Faculty and majors of the music engineering program assemble to discuss and demonstrate issues of artistic and technical applications of recording technology. Student projects, faculty, and guest lectures provide topical focus. (Music facility fee applies.) Prereq: MUSC 4560. Coreq: MUSC 4505. Cross-listed with MSRA 5580. Max hours: 12 Credits. **Semester Hours:** 3 to 3

MUSC 4581 - Audio Production Seminar II

A capstone project based course in which students complete professional quality projects in music production and/or post production. Students refine their engineering skills and develop new skills required for integration in the music

industry such as portfolio design and resume development. Prereq: MUSC 4580. Cross-listed with MSRA 5581. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4605 - Audio Post Production II

Students will learn advanced Pro Tools techniques by designing, conceptualizing, and completing sound for a student film project. This interdisciplinary course prepares students for working relationships between Recording Arts, Film and Video areas and an entry level job in post production. Prereq: MUSC 4505 and MUSC 4580. Cross-listed with MSRA 5605. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4740 - Music Business Analysis

Students learn to analyze specific managerial situations unique to the music and entertainment industries and will understand aspects of finance, taxation, and management science. Prereq: MUSC 3690, 3700, 3710 and 3755. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4820 - Digital Music Techniques

Studies the general principles and applications of digital music technology, emphasizing the function and operation of specific computer software. Topics include digital audio workstations, MIDI sequencers, digital signal processing programs, and distribution on optical discs and computer-based mediums. Prereq: Admittance to Recording Arts/Tech focus. Max hours: 3 Credits. **Semester Hours:** 3 to 3

MUSC 4890 - Music Business Senior Seminar

Seminar activities focus on students developing, discussing and completing individual capstone projects. This includes an in-depth research paper and in-class presentation to allow students to explore their relevant interests in the music business. Prereq: MUSC 3720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 1001 - Race, Gender, Class, & Health

Course focuses on the principles, tools, and population approach of social epidemiology as it relates health to race, gender, and class. Contemporary topics in public health will be used as case studies to illuminate principles and tools both in lecture and in recitation sections. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PBHL 2001 - Introduction To Public Health

An overview of the discipline and practice of public health. Includes the history of the field, its population perspective, emphasis on prevention, tools and techniques. General principles of the field are illustrated through contemporary

public health case studies. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3. **Semester Hours:** 4 to 4

PBHL 2020 - Introduction to Environmental Health

This introductory survey course focuses on the human health implications of environmental exposures. Topics include pathways of exposure, toxicology, risk assessment, regulations, and policy development. Additionally, environmental equity, ethics, globalization, international perspectives, climate change, sustainability, and activism are considered. Prereq: PBHL 2000 or 2001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 2052 - Global Demography and Health

This course examines current issues in population growth, fertility, mortality and migration throughout the globe; introduces basic demographic tools; encourages critical thinking about the causes and consequences of population change. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 2990 - Topics in Public Health

An in-depth study of selected social science perspectives/theories and their applications to population health. Topics will vary from semester to semester, with a particular emphasis on current, salient population health problems. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PBHL 3001 - Introduction to Epidemiology

Introduces the basic concepts of public health and epidemiology, including assessment of disease in the community, the study of causation and association of disease with lifestyle and environmental risk factors, as well as related special topics. We recommend coursework in college algebra or higher as preparation for this class. We recommend coursework in college algebra or higher as preparation for this class. We have found that students who take this class before completing their math requirements are at a distinct disadvantage in this course, which is math-intensive. Therefore a grade of C or higher in MATH 1110 or equivalent is strongly recommended. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PBHL 3002 - Ethnicity, Health and Social Justice

Surveys core issues contributing to racial or ethnic minority differences in health status. Historical and contemporary U.S. health and social policy, including the areas of environmental health, sexual and reproductive health, children and immigrants, are examined. Cross-listed with ETST 3002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3010 - Human Sexuality and Public Health

The focus of this course is on human sexuality using a public health lens, examining a number of sexual health issues and their relationship to individual, familial, organizational, and social-level influences. Additionally, we will focus on identifying both primary prevention and intervention approaches to reducing sexual risk factors and increasing healthy behaviors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3021 - Fundamentals of Health Promotion

Provides an overview of the field of health promotion, including an introduction to key theories and methods, as well as exposure to the breadth of programs and diversity of settings through several case studies. Includes attention to health behaviors as contributors to current public health problems and community-based approaches to health promotion in addressing them. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3030 - Health Policy

Health policies may have a profound effect on quality of life. Accessibility, cost, quality of health care; safety of food, water, and environment; the right to make decisions about our health; these issues are vitally tied to health policies. This course provides a framework for understanding the social, political and economic dimensions of health policy. Prereq: PBHL 2000 or 2001 with a C or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3031 - Health, Human Biology and Behavior

Introduces the multi-factorial nature of human health and well-being. Considers the influences of biology (genetics), behavior, environment, culture and social determinants, and health policy on the nature of disease and health problems from an integrated perspective. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3041 - Health, Culture and Society

Examines health and illness for individuals, families, and societies from multiple international perspectives, focused on topics such as traditional vs. Western medicine, characteristics of healers and therapeutic relationships, and stigmatized segments of society and their health status. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3050 - Decision Making

This course discusses current research on decision making/behavioral economics, as well as its application to individual well-being and public policy. You will gain insights on how and why people can be irrational in their daily decisions. Cross-listed with ECON 3050 and PSYC 3050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3051 - Mental Illness and Society

This course takes a social and public health--as opposed to medical, biological or psychiatric--approach to understanding mental disorder and society. Course addresses historical definitions of mental illness, social patterns of mental disorder and treatment and experience of mental illness patients, focusing on the U.S. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3070 - Perspectives in Global Health

Avian flu, disaster relief, aging populations and primary health care are key issues in a world where diseases cross

borders rapidly, but health care resources may not. Examines improvements in global health, growing inequalities and social justice in health. Prereq: PBHL 2000 or 2001 with a C or higher. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3071 - Global Topics In Sexual and Reproductive Health

Surveys trends and determinants of sexual and reproductive health around the globe and in the United States. Examines the social and behavioral determinants of sexual and reproductive health and the influence of policy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3200 - Human Migration: Nomads, Sojourners, and Settlers

Explores the relationship between human migration, voluntary and forced, and social organization and culture in the modern world. Case studies include pastoralists, foragers, refugees, immigrants, sojourners, and settlers and their impact on health, culture, identity, ethnicity, tradition and nationality. Cross-listed with ANTH 3200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3440 - Medical Sociology

This course covers key issues in population health and emphasizes how sociological perspectives both challenge and augment biomedical perspectives on health and health care. We also discuss the social causes and consequences of race/ethnic, sex, and socioeconomic disparities in health. Cross-listed with SOCY 3440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 3939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PBHL 4020 - Global Health: Comparative Public Health Systems

Within a limited period of time, middle and low income countries have experienced dramatic changes that affect the length and quality of peoples' lives. The health indicators for each country reflect a rich and meaningful context within interacting systems of economic, social, cultural patterns, and environmental and social justice. Analysis and contrast of public health indicators such as the millennium development goals develop an understanding of the complexity against a background of change. Prereq: Upper division and/or graduate standing. Cross-listed with URPL 6349. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4031 - Ethnographic Research In Public Health

Qualitative, ethnographic tools for practical applications in public health, including methods of direct observation, informant interviews, focus groups, structured ethnographic methods, rapid assessment and participatory action research. Basic analytic strategies, including review of computer software, coding and data display techniques. Cross-listed with HBSC 5031. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4040 - Social Determinants of Health

This course explores social inequalities in physical and mental health, the illness experience, the healing professions, health policy, relations between providers and patients, and the structure, access to, and financing of health care organizations, with some cross-national discussions. Prereq: PBHL 2000 or 2001 with a C or higher. Cross-listed with HBSC 5040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4060 - Evolutionary Medicine

Evolutionary medicine is a relatively new approach for understanding patterns of human health and disease. In this course, students will learn how human evolutionary history has shaped our susceptibility and resistance to both chronic and infectious diseases. Prereq: ANTH 1303. Cross-listed with HBSC 5060, ANTH 4060 and 5060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4070 - Health Disparities

The purpose of this seminar is to provide students with an understanding of how historical, psychosocial, environmental, and to some degree, biological and genetic factors contribute to inequality in health and health care. Course Prerequisites: PBHL 4040; PBHL 3001; PBHL 2051 Max hours: 6 Credits. **Semester Hours:** 3 to 3

PBHL 4080 - Global Health Practice

A travel-study course that provides students the opportunity to work on global health issues in the context of a supervised internship experience. In addition to a formal internship placement or directed research opportunity, students attend formal lectures and participate in seminars devoted to addressing those health issues most relevant to the country in which the course is being taught. Prereq: HBSC/ANTH 4010/5014, HBSC/ANTH 4020/5020, HLTH 6070 or equivalent. Cross-listed with ANTH 4080/5080, HBSC 5080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4090 - Political Economy of Drugs

Psychotropic drugs, both legal and illicit, are a predominant part of our everyday lives. This course examines their use and meaning within cultures, and the social, political and economic issues that surround their production, use and misuse. Prereq: Introductory course in Cultural Anthropology. Cross-listed with ANTH 4090/5090, and HBSC 5090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4099 - Capstone Experience in Public Health

Offers students the opportunity to integrate, synthesize and apply concepts learned throughout the core curriculum of the public health major to real-world issues. The course involves extensive writing and small group presentations on the epidemiological, global, social, environmental, and policy dimensions of current problems in public health. Prereq: PBHL 2000 or 2001, 2020, 3001, 3030 and 3070. Coreq: PBHL 4040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4110 - Public Health Perspectives On Family Violence

Public health views family violence from a prevention perspective. Our exploration of child abuse, intimate partner violence, and other forms of family violence will complement other disciplinary approaches by focusing heavily on the community and social factors that contribute to abusive relationships. Theories of power and coercion and approaches to researching these issues will be analyzed and discussed through our exploration of the various forms of family violence. Prereq: Advanced undergraduate standing. Cross-listed with HBSC 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4200 - The Global HIV/AIDS Epidemic

Provides a foundation for a critical analysis of HIV/AIDS in global context, concerning topics such as disease, the body, ethnicity/race, gender, sexuality, risk, addiction, power, and culture together with a set of ethnographic texts that explore the epidemic's impact. Cross-listed with HBSC 4200/5200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4620 - Health Risk Communication

Acquaints students with contemporary theory, research, and practice in health risk communication. Cross-listed with HBSC 5620, COMM 4620/5620, ENVS 5620. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PBHL 4840 - Independent Study

This course requires active independent learning based upon a written curricular outline and agreement with faculty in Public Health who supervise the student's work throughout the semester. Permission of instructor required. Max hours: 4 Credits. **Semester Hours:** 1 to 4

PBHL 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PBHL 4995 - Travel Study

A flexible format that permits courses to be taught in various areas of the world. Prereq: Upper division undergraduate standing and permission of instructor. Max hours: 12 Credits. **Semester Hours:** 3 to 9

PBHL 4999 - Topics In Public Health

An in-depth study of selected social science perspectives/theories and their applications to population health. Topics will vary from semester to semester, with a particular emphasis on current, salient population health problems. Prereq: Junior or senior standing or permission of instructor. Cross-listed with HBSC 5999. Max hours: 12 Credits. **Semester Hours:** 0 to 4

PBHL 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PHYS 1000 - Introduction to Physics

Introductory survey course for nonscientists that emphasizes the main concepts of physics. Although this course is mainly descriptive, some high school algebra will be used. The accompanying lab work is designed to illustrate the material discussed in the lectures. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1 **Semester Hours:** 4 to 4

PHYS 1052 - General Astronomy I

The history of astronomy is studied from early civilizations to the present. The basic motions of the earth, moon, sun, and planets are discussed both qualitatively and quantitatively, using elementary principles of physics. Properties of our solar system are discussed in detail, including results from unmanned space probes. Note: An additional 30 hours of laboratory work (at times to be arranged), plus appropriate report preparation time, are required to complete laboratory component of the course. Prereq: High school algebra or equivalent. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1 **Semester Hours:** 4 to 4

PHYS 1100 - Foundations of Physics

One-semester non-lab survey course especially designed for non-science majors. Acquaints students with some of the major principles and methods of physics. Includes applications of physics to everyday life and some discussion of the historical development of physics. Prereq: A good working knowledge of elementary algebra. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2 **Semester Hours:** 4 to 4

PHYS 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 1840 - Independent Study: PHYS

Students must check with a faculty member before taking this course. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 2010 - College Physics I

This is an algebra based physics course covering mechanics, heat and sound. Prereq: College algebra and trigonometry. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 4 to 4

PHYS 2020 - College Physics II

This is an algebra based physics course covering electricity, magnetism, light and modern physics. Prereq: PHYS 2010. Max hours: 4 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2. **Semester Hours:** 4 to 4

PHYS 2030 - College Physics Lab I

Max hours: 1 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

PHYS 2040 - College Physics Lab II

Prereq: PHYS 2030. Max hours: 1 Credit. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC1. **Semester Hours:** 1 to 1

PHYS 2311 - General Physics I: Calculus-Based

This is a calculus based physics course covering vector displacement, uniform and accelerated motion, force, momentum, energy, rotating systems, oscillations, and an introduction to thermodynamics. Emphasis is on basic principles. Prereq: MATH 1401. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 2321 - General Physics Lab I

Max hours: 1 Credit. **Semester Hours:** 1 to 1

PHYS 2331 - General Physics II: Calculus-Based

This is a calculus based physics course covering electrostatics, magnetic fields, electromagnetic waves (including light), and optics. Prereq: PHYS 2311 and MATH 2411. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 2341 - General Physics Lab II

Prereq: PHYS 2321. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PHYS 2711 - Vibrations and Waves

Introduces vibrations and waves associated with physical phenomena. Analytic and numerical methods in physical contexts. Topics include harmonic oscillators, resonance, coupled oscillators, nonlinear oscillators, waves in elastic media, sound waves, pulses and dispersion. Prereq: PHYS 2331 and MATH 2411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 2811 - Modern Physics I

Presents a study of the events and discoveries that occurred during the latter part of the 19th and the first part of the 20th centuries which led to the discovery of quantum mechanics; namely, special relativity, particle nature of radiation, wave properties of particles, models of the atom, and the introduction of quantum mechanics. Prereq: PHYS 2331 and MATH 2411. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 2821 - Modern Physics II

Quantum physics used for an understanding of energy levels and configuration of hydrogen atoms, strength of molecular bonds, atomic and molecular spectroscopy, solid state physics, band theory, nuclear and subatomic physics. Also includes quantum statistics, general relativity and cosmology. Prereq: PHYS 2811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 2840 - Independent Study: PHYS

Students must check with a faculty member before taking this course. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PHYS 3040 - Modern Cosmology

Designed for non-majors, covering the large-scale structure of the universe. Topics covered are gravitational concepts, neutron stars, pulsars, black holes, big bang universe and cosmological tests. Prereq: PHYS 2010 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3050 - General Astronomy II

Evolution of our sun and other stars is studied, as well as the methods used to gain the information. Discussion includes objects such as neutron stars, novae and supernovae, and black holes. Large-scale structures, including clusters and galaxies, are studied. Prereq: PHYS 1052, 2010 or 2311. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3070 - Physical Cosmology

Designed for science and engineering maj, stud. in quantitative fields/ w req math skills interested in physical universe. Covers large-scale structure of universe & its evolution from birth well into future. Gravitational concepts, neutron stars, black holes, big bang univ, cosmological tests, dark matter & energy. Problem solving emphasized. Prereq: PHYS 2020 or equivalent. Note: Routine knowledge of algebra, geometry and trigonometry is assumed. Knowledge of trig and calculus also useful. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3082 - Energy and the Environment

For students of various backgrounds who wish to increase their understanding of the environmental and technical issues of supplying the energy demands of our society. Alternative energy sources and conservation are explored as solutions to promote sustainable society. Prereq: One college-level science course and MATH 1110 or equivalent. Cross-listed with ENVS 3082. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3120 - Methods of Mathematical Physics

Typically covers calculus of variations, special functions, partial differential equations, integral transforms, linear vector spaces, and tensor analysis. Prereq: MATH 2421 and 3195 (or equivalent) or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3151 - Biophysics Outlook I

Designed as a companion to General Biology I (but can take stand-alone), this course explores how biophysics concepts and experimental methods add to the knowledge of life's processes at the molecular and cellular level. Prereq: PHYS 2010 and 2020 strongly recommended for optimal student success. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PHYS 3161 - Biophysics Outlook II

Designed as a companion to General Biology I (but can take stand-alone), this course explores how biophysics concepts and experimental methods contribute to the understanding of the structure and function of plants, animals & ecological systems. Prereq: PHYS 2010 and PHYS 2020 strongly recommended for optimal student success. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PHYS 3211 - Analytical Mechanics

Topics include the Lagrange and Hamiltonian formulations, the two-body problem, rigid body motion, and small oscillations. Prereq: PHYS 2711, MATH 2421 and 3195 or equivalent. Coreq: PHYS 3120. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 3251 - Biophysics of the Body

Fundamental ideas of anatomy, physiology, and biomechanics from the viewpoint of physics. Biological topics covered include: skeletal systems, muscular systems, circulatory systems, and human motion. Analytical mechanics topics include: newtonian mechanics, harmonic motion, energy conservation, and introductory fluid dynamics. Prereq: PHYS 2711, 3161, MATH 2421 and 3195 or equivalent or permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 3252 - Biophysics of the Body NM

Fundamental ideas of anatomy, physiology, and biomechanics from the viewpoint of physics. Biological topics covered include: skeletal systems, muscular systems, circulatory systems, and human motion. Analytical mechanics topics

include: newtonian mechanics, harmonic motion, energy conservation, and introductory fluid dynamics. Prereq: PHYS 2010 and PHYS 2020. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 3411 - Thermal Physics

Covers the basic concepts of the three related disciplines of thermodynamics, statistical mechanics, and kinetic theory. Prereq: PHYS 2331, 2811 and MATH 2421; Coreq: MATH 3195 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3451 - Biophysics of the Cell

Fundamentals of cellular biology from the viewpoint of physics. Biological topics covered include: the central dogma of molecular biology, cellular signaling, genetic regulation, molecular crowding, and ion channels. Statistical and thermal physics topics include: statistics, probability, thermodynamics, heat, and entropy. Prereq: PHYS 2811, 3151 and MATH 2421 or permission of instructor. Coreq: MATH 3195. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 3452 - Biophysics of the Cell NM

Fundamentals of cellular biology from the viewpoint of physics. Biological topics covered include: the central dogma of molecular biology, cellular signaling, genetic regulation, molecular crowding, and ion channels. Statistical and thermal physics topics include: statistics, probability, thermodynamics, heat, and entropy. Prereq: PHYS 2020, 2040 and 3151 or permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 3620 - Sound and Music

Considers the basic nature of sound waves, the ear and hearing, and musical instruments. Although this course is mainly descriptive, some high school algebra will be used. Prereq: MATH 1070 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3711 - Junior Laboratory I

Advanced laboratory in classical and modern physics. Prereq: PHYS 2811. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PHYS 3721 - Junior Laboratory II

Advanced laboratory in classical and modern physics. Prereq: PHYS 3711. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PHYS 3811 - Quantum Mechanics

A course in which both wave and matrix mechanics are developed and applied to selected problems in atomic physics. Prereq: PHYS 2811 and 3211. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 3840 - Independent Study: PHYS

Note: Students must check with a faculty member before taking this course. Max hours: 6 Credits. **Semester Hours:** 1 to 3

PHYS 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PHYS 4331 - Principles of Electricity and Magnetism

Elements of mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, polarized media, direct and alternating current theory, and introduction to electromagnetic fields and waves. Prereq: PHYS 2331 and 3120. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 4351 - Bioelectromagnetism

The fundamental theory of electric and magnetic fields is developed and applied to problems of biology and medicine. Examples in medical diagnostics and treatment are built upon rigorous application of Maxwell's equations and constitutive models of electromagnetic properties of biomaterials. Prereq: PHYS 2331 and 3120 or permission of instructor. Cross-listed with PHYS 5351. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 4352 - Bioelectromagnetism NM

This course is the non-majors' companion to PHYS 4351/5351 (taught simultaneously) using modeling approaches accessible to the general science student. Prereq: PHYS 2010, 2020 and MATH 1401 or permission of instructor. Cross-listed with PHYS 5352. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 4400 - Topics in Scientific Instrumentation and Laboratory Methods

Short courses on practical knowledge needed to design scientific instruments, develop technical products, and use special laboratory procedures to research. Topics include materials, mechanisms, electronics, and optics. Specific topic information is available through the physics department web site. Prereq: Two semesters of 2000-level introductory physics or instructor's permission. Cross-listed with PHYS 5400-5499. Max hours: 6 Credits. **Semester Hours:** 1 to 1

PHYS 4401 - Special Topics

Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 4510 - Optics

Presents a contemporary treatment of selected topics in optics, such as matrix methods in geometrical optics, the Fourier analysis approach to physical optics, and interaction of light with matter. Prereq: PHYS 2331, 2811 and 3120. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 4550 - Astrophysics

Covers stellar astrophysics, solar physics, star formations, stellar evolution, processes in the interstellar medium, galactic dynamics and evolution, formation of galaxies and cosmology. Prereq: MATH 3195; PHYS 2821 and 3050 recommended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 4610 - Computational Physics

Designed to provide an understanding of the role of the computer in modern theoretical physics by studying the simulation of physical phenomena in various fields of physics. Prereq: PHYS 3120. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PHYS 4620 - Computational Physics II

Assigns the student to an individual, advanced-level project modeling a physical phenomenon on the computer. Prereq: PHYS 4610. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PHYS 4650 - Solid State Physics

Covers the basic thermal and electrical properties of solids which are explained in terms of the Brillouin zone structures of phonons and electrons. Prereq: PHYS 3411 and 3811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 4711 - Senior Laboratory I

Individual project laboratory with emphasis on modern methods of physical experimentation. Prereq: PHYS 3721. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PHYS 4721 - Senior Laboratory II

Individual project laboratory with emphasis on modern methods of physical experimentation. Prereq: PHYS 4711. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PHYS 4810 - Atomic and Molecular Structure

A course in which quantum mechanical methods are applied to problems in atomic and molecular physics, such as the one-electron atom, atomic and molecular spectra, and particle scattering. Prereq: PHYS 3811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 4820 - Subatomic Physics

Introductory treatment of the various concepts and models used to describe nuclear and high energy particle phenomena. Prereq: PHYS 2811. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 4840 - Independent Study: PHYS

Note: Students must check with a faculty member before taking this course. Max hours: 12 Credits. **Semester Hours:** 1 to 3

PHYS 4850 - Physics for Design and Innovation I

A service-learning project using fundamental physical principles to design a prototype scientific instrument, technical device, or technical process for a real-world client. Includes instruction on project management, intellectual property, and market analysis. Cross-listed with PHYS 5850. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PHYS 4852 - Physics for Design and Innovation II

A capstone project using fundamental physical principles to prototype a scientific instrument, technical device or technical process. The focus is on the student's own product idea. Includes online guided readings on the wider context of product development. Students should consult with instructor on necessary physics and mathematics preparation for the project. Prereq: PHYS 4850. Cross-listed with PHYS 5852. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PHYS 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PHYS 4920 - Advanced Undergraduate Seminar

Studies a focused topic such as: size and age of the universe, critical phenomena, non-linear optics, energy, fiber-optic communications, among others. Students research these topics and give a seminar outlining their findings. Prereq: PHYS 2811 or permission of instructor. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PHYS 4939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 3

PHYS 4980 - Advanced Physics Topics

Covers a particular topic, as announced in the 'Schedule Planner.' Note: May be taken more than once for credit in different topics. Prereq: PHYS 2811. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 5101 - XP Forces and Motion

Concepts of motion, forces, momentum, and mechanical energy are connected to major technologies. A key goal is to exhibit how an experienced practitioner from a field other than physics assimilates these concepts into applications in daily life and the workplace. Prereq: permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 5102 - XP Electromagnetism and Energy

Concepts such as charge, current, electric field, potential, and magnetic field are developed with focus on energy and power generation. A key goal is to exhibit how an experienced practitioner from a field other than physics assimilates these concepts into applications in daily life and the workplace. Prereq: Permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 5103 - XP Light, Color and Optics

The physical nature of light explains optical technologies using illumination, shadows, reflection, refraction, color, polarization and interference. A key goal is to exhibit how an experienced practitioner from a field other than physics assimilates these concepts into applications in daily life and the workplace. Prereq: Permission of instructor required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PHYS 5104 - RM-MSMSP Aviation Fundamentals

Designed for teachers in the RM-MSMSP program Explores flight instruments, aerodynamics, safety of flight, charts/airspace, radios/communication, weather, navigation, aircraft performance, NASA microgravity and medical issues, cross country flight, route and aircraft planning, Crew resource management, aeronautical decision making and more. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 5105 - RM-MSMSP Research Experience for Teachers - Physics Cohort

A five - week research exploration in which RM-MSMSP teachers will raise their level of relevant scientific understanding by engaging in a "hands-on" workshop, transforming what they have learned into new curricular materials that will improve the scientific abilities of their students and hopefully stimulate them to consider a STEM career. Note: credit may not apply toward any CLAS degree. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PHYS 5351 - Bioelectromagnetism

The fundamental theory of electric and magnetic fields is developed and applied to problems in biology and medicine. Examples in medical diagnostics and treatment are built upon rigorous application of Maxwell's equations and constitutive models of electromagnetic properties of biomaterials. Prereq: PHYS 2331 and 3120 or permission of instructor. Cross-listed with PHYS 4351. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 5352 - Bioelectromagnetism NM

This course is the non-majors' companion to PHYS 4351/5351 (taught simultaneously) using modeling approaches accessible to the general science student. Prereq: PHYS 2010, 2020 and MATH 1401 or permission of instructor. Cross-listed with PHYS 4352. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PHYS 5400 - Topics in Scientific Instrumentation and Laboratory Methods

Short courses on practical knowledge needed to design scientific instruments, develop technical products, and use special laboratory procedures in research. Topics include materials, mechanisms, electronics, and optics. Specific topic information is available through the physics department web site. Cross-listed with PHYS 4400-4499. Max hours: 6 Credits. **Semester Hours:** 1 to 1

PHYS 5401 - Special Topics

Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 5840 - Independent Study: PHYS

Note: Students must check with a faculty member before taking this course. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PHYS 5850 - Physics for Design and Innovation I

A service-learning project using fundamental physical principles to design a prototype scientific instrument, technical device, or technical process for a real-world client. Includes instruction on project management, intellectual property, and market analysis. Cross-listed with PHYS 4850. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PHYS 5852 - Physics for Design and Innovation II

A capstone project using fundamental physical principles to prototype a scientific instrument, technical device or technical process. The focus is on the student's own product idea. Includes online guided readings on the wider context of product development. Students should consult with instructor on necessary physics and mathematics preparation for the project. Prereq: PHYS 4850 or 5850. Cross-listed with PHYS 5852. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PHYS 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PHYS 5939 - Internship

Note: Students must check with a faculty member before taking this course. Max hours: 9 Credits. **Semester Hours:** 1 to 6

PHYS 5950 - Master's Thesis

Note: Students must check with a faculty member before taking this course. Max hours: 8 Credits. **Semester Hours:** 1 to 8

PHYS 5960 - Master's Project

Note: Students must check with a faculty member before taking this course. Max hours: 8 Credits. **Semester Hours:** 1 to 8

PHYS 5980 - Advanced Physics Topics

Covers a particular topic as announced in the 'Schedule Planner.' Note: May be taken more than once for credit in different topics. Prereq: PHYS 2811 or permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

PHYS 6840 - Independent Study: PHYS

Note: Students must check with a faculty member before taking this course. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PMUS 1001 - Music Appreciation

Explores the style of music in the major compositional periods, including contemporary pop styles. This course will not satisfy any degree requirements for music majors. For non-music majors who want to learn how to listen to music with greater understanding and pleasure. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1 **Semester Hours:** 3 to 3

PMUS 1020 - Beginning Musicianship

Provides basic musical and theoretical skills to students who do not have the proficiency to enroll in Theory I and Ear Training I. Major concepts include an introduction to music fundamentals, basic ear training, introduction to sight singing and an applied understanding of the keyboard. This course will not satisfy any degree requirements for Music majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 1021 - Piano Class For Non-Majors

Elementary group instruction in piano skills for non-majors. Course focuses upon development of basic reading and performance skills for the non-Music Major. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1022 - Piano Class II for Non-Majors

Intermediate to Advanced instruction in piano skills for non-majors. Course focuses on further development of reading and performance skills for the non-Music Major. Prereq: PMUS 1021 or permission of instructor. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1023 - Piano Class I

This course focuses on beginning note reading in both treble and bass clefs, learning one octave major key scales, basic harmonization, and beginning improvisation. Students perform in both individual and group settings. Note: This course is restricted to Music-Majors only. Coreq: PMUS 1100 and 1110. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 1024 - Piano Class II

This course focuses on intermediate sight reading, technique, chord vocabulary, major and minor scales, and improvisation. Students perform in both individual and group settings. Note: This course is restricted to Music-Majors only. Prereq: PMUS 1023. Coreq: PMUS 1200 and 1210. Max hours: 1 Credits. **Semester Hours:** 1 to 1

PMUS 1025 - Piano Class III

Students entering this course are expected to have general fluency in major and minor scales. The course focuses on expanding chord vocabulary, sight reading, transposition, and performing more advanced repertoire. Students perform in both individual and group settings. Note: This course is restricted to Music-Majors only. Prereq: PMUS 1024. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1026 - Piano Class IV

Students entering this course are expected to have fluency in sight reading, major and minor scales. The course focuses on harmonizing with complex chords, playing by ear, improvisation, and playing repertoire in broader range of key signatures. Students perform in both individual and group settings. Note: This course is restricted to Music-Majors only. Course meets in Roland Piano Lab. Prereq: PMUS 1025. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1040 - Class Guitar

Designed to provide each student with a basic knowledge of the fretboard. The course material focuses on beginning note reading, basic chord forms and elementary improvisation. Students have the opportunity to perform in both individual and group settings. Max hours: 3 Credits. **Semester Hours:** 1 to 1

PMUS 1041 - Class Guitar II

This group guitar class is designed to go beyond PMUS 1040 and provide students with an advanced knowledge of the fretboard. The course material focuses on advance position note reading, complex chord forms and scale vocabulary.

Students have the opportunity to perform in both individual and group settings. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1045 - Class Guitar I for Non-Majors

This class will address basic techniques and concepts of playing the guitar, for non-majors. Students will gain a basic proficiency with regard to picking and fingerstyle technique, and learn essential contemporary harmony through the performance of etudes and songs. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1046 - Class Guitar II for Non-Majors

This class will address basic techniques and concepts of playing the guitar, for non-majors. Students will gain a basic proficiency with regard to picking and fingerstyle technique, and learn essential contemporary harmony through the performance of etudes and songs. Prereq: PMUS 1045. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1047 - The Beatles for Fingerstyle Guitar

This course will examine the music of The Beatles, through harmonic analysis, technical etudes and performance practice. Students will develop a basic proficiency with regard to specific fingerstyle techniques. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1050 - Voice Class I

Fundamentals of voice production: posture, breath management and support, tone, resonance, diction, phrasing and interpretation. Development of technique, confidence, and control through group and solo singing. Development of repertoire that includes contemporary and commercial vocal styles. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1051 - Voice Class I for Non-Majors

Voice technique and repertoire for non-music majors taught in a group setting. Students will learn basics of healthy singing technique and how to sing in multiple genres in both group and solo formats. For non-majors with little or no previous singing experience. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1060 - Voice Class II

Fundamentals of voice production: posture, breath management and support, tone, resonance, diction, phrasing and interpretation. Extension of PMUS 1050, with opportunity to continue to develop individual skills in singing. Development of technique, confidence, and control through group and solo singing. Development of repertoire that includes contemporary and commercial vocal styles. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1061 - Voice Class II for Non-Majors

Intermediate Voice technique for non-majors taught in a group setting. Students will learn elements of technique, style

and repertoire geared toward non-majors. Some singing experience or successful completion of Voice I for Non-Music Majors required. Prereq: PMUS 1051 or permission from the instructor. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1100 - Music Theory I

Study of the evolution of harmonic and melodic procedures, as derived from the common practice period of classical music, and their relationship to contemporary music concepts. Coreq: PMUS 1110 and PMUS 1023. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 1101 - Music Theory & Ear Training Lab

Provides supplemental instruction and tutoring for students enrolled in Theory I and Ear Training Sight Signing I. Course activities include training in the following subject areas: scale formation and identification, chord spelling and identification, interval spelling and identification, basic harmonic analysis and rhythmic dictation. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1110 - Ear Training and Sight Singing I

An aural skills laboratory course that reinforces the concepts taught in Music Theory I through interval, melodic, harmonic, and rhythmic dictation as well as the preparation and sight singing of music. Coreq: PMUS 1100 and PMUS 1023. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1200 - Music Theory II

The study of harmonic and melodic elements as they relate to modern, jazz, and commercial music. Topics include contemporary chord spelling, chord substitution, transposition, voice leading, harmonic analysis and modes. Prereq: PMUS 1023, 1100, and 1110. Coreq: PMUS 1210 and PMUS 1024. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 1210 - Ear Training and Sight Singing II

An intermediate aural skills laboratory course that reinforces the concepts taught in Music Theory II through interval, melodic, harmonic, and rhythmic dictation as well as the preparation and sight singing of music.. Prereq: PMUS 1100 and PMUS 1110. Coreq: PMUS 1200 and PMUS 1023. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1310 - Sight Reading and Improvisation

Explores the techniques and concepts of instrumental jazz/commercial improvisation and beginning sight reading. Major concepts include understanding and interpreting the construction of jazz harmonic nomenclature and the mastery of the melodic elements of improvisation. Prereq: PMUS 1200, 2.0 credits from PMUS 1801 to PMUS 1823 (MIS Applied Lesson). Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 1400 - Group Applied Lessons

Consists of group music lessons of up to four students per group. The course meets for one hour per week. 45 minutes will be in group format and 15 minutes will be rotating private instruction. Note: PMUS 1400 is only available to majors in the Music Industry Studies degree program. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 1410 - Bembe Ensemble (Beginning Percussion)

Beginning Ensemble. Focus on basic percussion techniques and introductory ensemble playing utilizing Afro-Cuban literature. Comprised of percussion instruments of both definite and indefinite pitch. Introduces rhythmic sight-reading. Develops collaborative learning, aural skills and interactive multicultural awareness. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 1420 - UCD A Cappella Voices Ensemble

Beginning Ensemble. A cappella choir. This course will focus on choral singing to further the student's musical and vocal skills. Emphasis will be on successful preparation for the advanced a cappella groups. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 1430 - Solo Vocal Jazz Ensemble

Beginning Ensemble. Focus on basic performance and stylistic skills in the jazz language. Students will learn basic and jazz vocal techniques and skills and their application in study and performance. Students will perform in solo and duo settings. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 1440 - Acoustic Guitar Ensemble

Beginning Ensemble. This course explores the techniques and repertoire of acoustic guitar. Musical styles include: jazz, Latin, bluegrass, Renaissance, Baroque, tango and blues. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 1460 - Beginning Instrumental Ensemble

Focus on basic performance and stylistic skills in the jazz, Latin, and blues genres. Students will learn basic instrumental techniques and their application in group performances. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 1470 - Performance Practice Ensemble

This beginning-level ensemble explores individual and group performance settings for first year audition-based MEIS students. Course skills include: performance protocol, presentation, self assessment and peer assessment. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1500 - General Recital

This pass/fail course is a co-requisite for all students enrolled in applied music instruction. Students will evaluate and critique musical performances and presentations as well as develop an informed understanding of live musical performance as it pertains to diversity of genre and excellence in musical achievement. Max hours: 12 Credits.

Semester Hours: 1 to 1

PMUS 1502 - Applied Bass

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1522 - Applied Bassoon

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1532 - Applied Clarinet

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1542 - Applied Bass Clarinet

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1552 - Applied Flute

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1562 - Applied French Horn

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1572 - Applied Guitar

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1574 - Applied Guitar, Singer/Songwriter

Private instruction guitar specific to singer/songwriter majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Restricted: BS-MUSC SWR. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Student must be accepted as a Singer/Songwriter major in the music program and have declared guitar as their primary instrument. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1582 - Applied Banjo

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1610 - Topics in Performance Music

Various topics related to music performance. Max hours: 6 Credits. **Semester Hours:** 1 to 1

PMUS 1612 - Applied Drum Kit

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1620 - Topics: Performance Music II

Various topics related to music performance. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 1622 - Applied Oboe

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1630 - Topics: Performance Music III

Various topics related to music performance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 1632 - Applied World Percussion

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1642 - Applied Piano

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1644 - Applied Piano, Singer/Songwriter

Private instruction in piano specific to singer/songwriter majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Restricted: BS-MUSC SWR. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Student must be accepted as a Singer/Songwriter major in the music program and have declared piano as their primary instrument. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1652 - Applied Jazz Piano

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1662 - Applied Saxophone

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1672 - Applied Synthesizer

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1682 - Applied Trombone

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1692 - Applied Trumpet

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1702 - Applied Violin

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1712 - Applied Viola

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1722 - Applied Cello

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1732 - Applied Voice

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1734 - Applied Voice, Singer/Songwriter

Private instruction in voice specific to singer/songwriter majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Restricted: BS-MUSC SWR. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Student must be accepted as a Singer/Songwriter major in the music program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1742 - Applied Tuba

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1762 - Applied Euphonium

Private music lessons for audition-based music majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Students perform in a general recital and jury. Note: Students must be accepted as an audition-

based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1801 - Appl Electric Bass, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1802 - Appl String Bass, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1803 - Applied Guitar, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1804 - Applied Percussion, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1805 - Applied Drum Kit, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1806 - Applied Piano, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1807 - Applied Jazz Piano, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1808 - Applied Voice, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1809 - Appl Synthesizer, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1810 - Applied Trumpet, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1811 - Applied Trombone, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1812 - Applied Tuba, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1813 - Appl French Horn, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1814 - Applied Euphonium, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1815 - Applied Banjo, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1816 - Applied Bassoon, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1817 - Applied Clarinet, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis

area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1818 - Applied Flute, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1819 - Applied Saxophone, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1820 - Applied Oboe, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1821 - Applied Cello, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1822 - Applied Viola, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 1823 - Applied Violin, Non-Juried

Private music lessons for Music Industry Studies majors. Lessons emphasize developing fundamental technique, learning and performing standard repertoire, understanding the foundations of musicality, sight reading and developing rhythmic accuracy. Note: Only available to non audition based music majors in the Music Industry Studies emphasis area. Coreq: PMUS 1500 and at least 7 non-applied lesson credits. Prereq: Acceptance to the MEIS program. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2092 - Commercial Piano Styles I

This course will teach students how the piano is used in major commercial piano styles of the twentieth and twenty-first centuries. Students will develop a found of skills and knowledge that can be applied to professional music settings. Students must pass a piano audition or have permission from the instructor. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 2093 - Commercial Piano Styles II

This course with teach students in-depth stylistic performance skills, strategic improvisation, composition, and arranging. Students must pass a piano audition, or complete PMUS 2092, or have permission from the instructor. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 2094 - Rhythm Section Techniques

This course examines jazz and contemporary techniques for the rhythm section. Students will learn styles, skills and expectations for various rhythm instruments including guitar, bass, piano, and drum kit in order to improve musical communication, accompaniment skills and creativity. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 2095 - Commercial Guitar Styles and Theory - Harmony

A comprehensive guitar course that focuses on harmonic theory specific to the guitar fingerboard. Topics include: chord voicing and inversions, jazz and commercial accompaniment styles including walking bass, bossa nova, funk and finger picking. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 2096 - Commercial Guitar Styles and Theory - Melody

A comprehensive guitar course that focuses on harmonic theory specific to the guitar fingerboard. Topics include: tetrachords, scales, modes, arpeggios, finger technique development and improvisation. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 2097 - Commercial Singing I

Fundamentals of voice production: posture, breath management and support, tone, resonance, diction, phrasing and interpretation. Development of contemporary solo vocal repertoire (pop, rock, jazz, rhythm and blues) and traditional styles. Training in all aspects of vocal performance needed for live performance and recording sessions (microphone technique, stage presence, appropriate vocal styles and delivery). Development of solid understanding of vocal technique and its application to all vocal styles. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 2098 - Commercial Singing II

Fundamentals of voice production: posture, breath management and support, tone, resonance, diction, phrasing and interpretation. Extension of PMUS 3010, with opportunity to continue to develop individual skills in commercial solo singing. Development of contemporary solo vocal repertoire (pop, rock, jazz, rhythm and blues) and traditional styles. Training in all aspects of vocal performance needed for live performance and recording sessions (microphone technique, stage presence, appropriate vocal styles and delivery). Development of solid understanding of vocal technique and its application to all vocal styles. Prereq: PMUS 3010. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 2100 - Music Theory III

Exposes students to the theoretical aspects of Western European classical music from the Baroque period to the Classical period. Emphasis is placed on the melodic aspects of classical music including the creation of melody and the combining of melodies into polyphonic structures. Prereq: PMUS 1200, 1210, and 1024. Coreq: PMUS 1025 and 2110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 2110 - Ear Training and Sight Singing III

An advanced laboratory course designed to help students listen to music analytically and to apply the harmonic principles learned in Music Theory III to the performance of music. Prereq: PMUS 1200 and PMUS 1210. Coreq: PMUS 2100 and PMUS 1023. Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 2200 - Jazz Theory

Explores music theory as it applies to the genres of jazz and popular music. The topics include the theory of jazz improvisation, an analysis of jazz and popular music forms, the transcription and analysis of pop/jazz rhythms and melodies, and chord substitutions. Prereq: PMUS 1200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 2220 - Commercial Electronic Music Composition

An investigation, analysis and application of contemporary electronic music compositional and production techniques in relation to commercial music and historical context. Prereq: PMUS 1200, PMUS 1210 and MUSC 2300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 2310 - Introduction to Songwriting

Studies the craft of songwriting. Emphasis is on the creation of original melodies and lyrics. A variety of non-classical contemporary musical styles are considered. Prereq: PMUS 1200, 2.0 credits from PMUS 1801 to PMUS 1823 (MIS Applied Lesson). Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 2400 - Performance Art and Experimental Music

Introduces the history, philosophies and techniques of the European and American Avant-Garde theatrical performance

and music. A study of music's various roles provides students with opportunities for creative application. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 2410 - Abakua Ensemble (Intermediate Percussion)

Intermediate Ensemble. Focus on percussion techniques and ensemble playing utilizing Afro-Cuban literature. Comprised of percussion instruments of both definite and indefinite pitch. Assumes basic rhythmic sight-reading ability. Introduces theoretical concepts. Develops collaborative learning, aural skills and interactive multicultural awareness. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 2420 - Electro/Acoustic Ensemble

Intermediate Ensemble. This course will study established methods used as agents of musical creativity in the practice of improvised music. Focus on real-time musical collaboration utilizing musical vocabularies from a wide range of sources. Instrumentation of many kinds may be utilized. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 2430 - Pop/Rock Ensemble

Intermediate Ensemble. This course will focus on group rehearsals of contemporary music with challenging technical and vocal requirements. Students will gain experience in transcribing and creating simple arrangements, learning adequate musicality, performing presentation and group cooperation. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 2440 - Chamber Ensemble

Intermediate Ensemble. Mixed instrumental group for string, wind, brass, piano, and percussion players. Students will develop sight-reading and improvisation skills and perform student originals and arrangements including repertoire from the Baroque period through the Avant-Garde with no stylistic limitations. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 2450 - Bluegrass Ensemble

Ensemble designed to give students the opportunity to explore Bluegrass music and related folk/country styles through performance, listening and discussion. Important artists, repertoire, musical trends, and historical perspectives will be studied. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 2460 - Music Theatre Ensemble

Beginning Ensemble. This course consists of group rehearsals of contemporary and original music theater works with a focus on techniques, technologies, and strategies for arranging. Score reading, transposition, ranges, orchestration and composition will be covered. Prereq: Audition or meeting with ensemble faculty. Max hours: 6 Credit. **Semester Hours:** 1 to 1

PMUS 2461 - Musical Theater Ensemble Production

Students will participate in a fully-staged musical theater production to be held every other year in the spring semester. This will include, but is not limited to: auditions, musical coachings, stage and/or acting coachings and dance. Prereq: Audition or meeting with ensemble faculty. Max hours: 12 Credits. **Semester Hours:** 3 to 3

PMUS 2470 - Mobile Device Ensemble

This ensemble will be comprised of students utilizing only laptop computers and mobile devices (e.g., iPads & iPhones) to create music. The ensemble will explore various contemporary styles including house, dance, ambient and other current electronic music. Max hours: 4 Credits. **Semester Hours:** 1 to 1

PMUS 2502 - Applied Bass

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1502 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2522 - Applied Bassoon

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1522 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2532 - Applied Clarinet

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1532 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2542 - Applied Bass Clarinet

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1542 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2552 - Applied Flute

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1552 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2562 - Applied French Horn

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1562 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2572 - Applied Guitar

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1572 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2582 - Applied Banjo

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1582 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2612 - Applied Drum Kit

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1612 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2622 - Applied Oboe

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major.

Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1622 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2632 - Applied World Percussion

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1632 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2642 - Applied Piano

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1642 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2652 - Applied Jazz Piano

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1652 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2662 - Applied Saxophone

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1662 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2672 - Applied Synthesizer

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1672 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2682 - Applied Trombone

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1682 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2692 - Applied Trumpet

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1692 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2702 - Applied Violin

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1702 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2712 - Applied Viola

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1712 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2722 - Applied Cello

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1722 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2732 - Applied Voice

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1732 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2742 - Applied Tuba

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1742 (Two semesters). Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 2750 - Functional Guitar Skills: Acoustic Guitar Styles

This course is designed to introduce students to the fundamental architecture and techniques of contemporary acoustic guitar styles. The first part of the course will explore the techniques, repertoire and styles of Fingerstyle Guitar, while the second half will be dedicated to Flatpicking styles and techniques. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 2751 - Functional Guitar Skills: Electric Guitar Styles

This course is designed to introduce students to the fundamental architecture and techniques of contemporary electric guitar styles with regard to studio and live performance situations. Students will also explore the business aspects of music performance including marketing, self-assessment, career strategies, recording, and press kits. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 2762 - Applied Euphonium

Private music lessons for audition-based music majors. Lessons emphasize developing proficient technique, learning and performing advanced repertoire, demonstrating musicality, developing rhythmic accuracy and improvising. Students perform in a general recital and jury. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1762 (Two semesters). Max hours: 1 Credit. **Semester Hours:** 1 to 1

PMUS 3060 - Ensemble Engineer

This engineer position is designed to provide audio support for a various performing ensembles. Duties include live audio reinforcement during concerts and rehearsals, audio archiving, organization and equipment management. Enrollment is limited to one semester for non-audition track students and two semesters for audition-track students. Prereq: MUSC 4530. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 3070 - Ensemble Manager

This manager position is designed to provide booking, promotional and organizational support for various performing ensembles. Enrollment is limited to one semester for non-audition track students and two semesters for audition-track students. Prereq: MUSC 3690. Max hours: 2 Credits. **Semester Hours:** 1 to 1

PMUS 3100 - US Music: Social & Political Impact

Examines and describes the social meaning of American music with particular reference to the roles of major ethnic groups in the creation of this music and the way that the music reveals attitudes toward these groups. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3110 - Social and Political Implications of American Music

Examines and describes the social meaning of American music with particular reference to the roles of major ethnic groups in the creation of this music, and the way that the music reveals attitudes toward these groups. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3200 - Popular Music Performance Skills

Students develop live performance skills including expression, stage presence and creating energy on stage, as well as connecting with the audience. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3210 - Introduction to Teaching Private Music Lessons

Prepares students to teach private music lessons. Includes a survey of teaching styles from around the world, exercises, guest lectures, practical guidance for establishing a teaching studio and student research presentations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3220 - Vocal Pedagogy

Students will develop a working knowledge of postural, breathing, articulatory, and vocal anatomy, vocal hygiene, and methodology prior to teaching voice in to prevent harm. Students will learn how to listen critically and develop intuition, analytical, and diagnostic skills. Restriction: Restricted to Music majors. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3300 - Advanced Jazz Improvisation

Explores the techniques and concepts of instrumental jazz/commercial improvisation and sight reading. Major concepts include understanding and interpreting the construction of jazz harmonic nomenclature and the mastery of the melodic elements of improvisation. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3310 - Intermediate Songwriting

Presents concepts of songwriting that build upon those presented in MUSC 2300. Students are expected to understand and discuss musical concepts and lyric structure and use these concepts in the creation of original songs. Prereq: PMUS 1024, PMUS 1200, and PMUS 1210. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3320 - Popular Music Arranging

This course will focus on techniques, technologies and strategies for contemporary arranging. Students score original compositions for various instrumentation using notation software. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3330 - Advanced Vocal Improvisation

Provides study of harmony, style and advanced improvisation techniques for vocalists. Course activities include study of scat singing, syllables, accents, rhythmic patterns, and phrasing over standard chord changes in several genres. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3410 - Rumba Ensemble (Advanced Percussion)

Advanced Ensemble. Focus on percussion techniques and ensemble playing utilizing Afro-Cuban literature. Comprised of percussion instruments of both definite and indefinite pitch. Assumes intermediate rhythmic sight-reading ability. Develops collaborative learning and awareness of drumming as universal language. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 3430 - Jazz Combo Ensemble

Advanced Ensemble. Instrumental jazz group. This course will focus on group rehearsals of bebop, swing, funk, & fusion. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 3450 - Singer/Songwriter Ensemble

Advanced Ensemble. Focus on student compositions of original songs with lyrics and instrumental accompaniment including creation of lead sheets for band performances. Individual and group songwriting is explored. Students participate in community-building activities including community engagement and a songwriting retreat. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 3460 - Ninth Street Singers Ensemble

Signature Ensemble. Elite a cappella mixed choir. This course will focus on group rehearsals of various genres of vocal ensemble music, including pop, rock, jazz, musical theater, and gospel. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 3470 - Piano Trio Ensemble

Advanced Piano, Bass and Drum Students will create piano trios, receive feedback from faculty in weekly coaching sessions, and have professional opportunities such as gigs and recordings. Contexts include: Standard Jazz, Contemporary Jam Band and original arrangements. **Semester Hours:** 1 to 1

PMUS 3502 - Applied Bass

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1502 and PMUS 2502 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3522 - Applied Bassoon

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1522 and PMUS 2522 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3532 - Applied Clarinet

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1532 and PMUS 2532 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3542 - Applied Bass Clarinet

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1542 and PMUS 2542 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3552 - Applied Flute

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1552 and PMUS 2552 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3562 - Applied French Horn

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1562 and PMUS 2562 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3572 - Applied Guitar

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1572 and PMUS 2572 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3582 - Applied Banjo

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1582 and PMUS 2582 (two semesters each), and successful completion of sophomore proficiency. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 3612 - Applied Drum Kit

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1612 and PMUS 2612 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3622 - Applied Oboe

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1622 and PMUS 2622 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3632 - Applied World Percussion

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1632 and PMUS 2632 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3642 - Applied Piano

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1642 and PMUS 2642 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3652 - Applied Jazz Piano

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1652 and PMUS 2652 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3662 - Applied Saxophone

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1662 and PMUS 2662 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3672 - Applied Synthesizer

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1672 and PMUS 2672 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3682 - Applied Trombone

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1682 and PMUS 2682 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3692 - Applied Trumpet

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1692 and PMUS 2692 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3702 - Applied Violin

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1702 and PMUS 2702 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3712 - Applied Viola

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1712 and PMUS 2712 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3722 - Applied Cello

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1722 and PMUS 2722 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3732 - Applied Voice

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1732 and PMUS 2732 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3742 - Applied Tuba

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1742 and PMUS 2742 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3762 - Applied Euphonium

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing and performing repertoire, demonstrating a high level of musicality, cultivating superior performance practice, identifying musical goals and preparing and performing a junior recital. Note: Students must be an audition-based music major and accepted to performance emphasis. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1762 and PMUS 2762 (two semesters each), and successful completion of sophomore proficiency. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3772 - Applied Singer/Songwriter

This is a 2-credit course consisting of one-on-one, hour-long weekly lessons in songwriting and performance skills. Aspects of transcription, analysis, and career development will be incorporated. Co-requisites - PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 3820 - Music History Modules

This modular course surveys various popular, Western European, and world music styles. Max hours: 6 Credits. **Semester Hours:** 1 to 1

PMUS 3825 - Real History of Rock and Roll

Examines the historical and social framework developments in music from its roots in country, through jazz and blues to current trends. Special emphasis is given to guest lecturers and their expertise performing, covering and presenting the music. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3827 - History Of Jazz

This course will give students an inside look at the history and radical changes brought about by the musicians, technology and the social interplay between US social history and jazz music by examining the music & musicians that performed it. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3830 - History and Literature of Music I

This course provides a historical perspective of Western music literature from the medieval through the classical era. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3831 - History and Literature of Music II

This course provides a historical perspective of Western music literature from the Romantic era through the present day. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 3840 - Independent Study: PMUS

Max hours: 3 Credits. **Semester Hours:** 1 to 3

PMUS 4060 - Music Theory Analysis

Students analyze the harmonic, melodic, and formal aspects of the music from various musical time periods and genres which include Baroque, Classical, Romantic, Contemporary Classical, jazz and popular music. Prereq: PMUS 2110 and 2200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 4200 - Senior Recital Project

The capstone course for performance majors that coincides with their senior recital. The project focuses on musical and thematic material from the student's senior recital and may include: historical research, theoretical analysis, transcriptions and creation of a digital portfolio. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PMUS 4310 - Advanced Songwriting

Students will continue to learn the craft of songwriting with focus on the skills of advanced lyric writing technique. Students will expand their knowledge of theoretical aspects of harmony and melody. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PMUS 4410 - Claim Jumpers Ensemble

Signature Ensemble. The Claim Jumpers will focus on group rehearsals of significant traditional jazz literature, masterworks of classic jazz of the 1920's, and creativity within the traditional jazz genre at the highest level. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 4430 - Guitar Ensemble

Signature Ensemble. Advance jazz guitar group. This course will focus on group rehearsals of bebop and fusion. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 4440 - Voz de la Clave

Signature Ensemble. This ensemble performs Salsa and Afro-Caribbean music. Ensemble time is spent rehearsing repertoire and learning about Latin music concepts. Prereq: Audition or meeting with ensemble faculty. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 4460 - Mix A Cappella Ensemble

Advanced a cappella performing group, working in a wide range of stylistic offerings. Enrollment by audition only. Max hours: 8 Credits. **Semester Hours:** 1 to 1

PMUS 4461 - UCD Mix Ensemble Management

This class focuses on management activities for the "UCD Mix" A Capella ensemble, including website content, arranging, choreography and recording roles as assigned by the professor. Coreq: PMUS 4460. Max hours: 4 Credits. **Semester Hours:** 1 to 1

PMUS 4502 - Applied Bass

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1502, PMUS 2502, PMUS 3502 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4522 - Applied Bassoon

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1522, PMUS 2522, PMUS 3522 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4532 - Applied Clarinet

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing

professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1532, PMUS 2532, PMUS 3532 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4542 - Applied Bass Clarinet

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1542, PMUS 2542, PMUS 3542 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4552 - Applied Flute

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1552, PMUS 2552, PMUS 3552 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4562 - Applied French Horn

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1562, PMUS 2562, PMUS 3562 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4572 - Applied Guitar

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1572, PMUS 2572, PMUS 3572 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4582 - Applied Banjo

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical

identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1582, PMUS 2582, PMUS 3582 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4600 - Topics in Music Performance

Various topics related to music performance. Max hours: 9 Credits. **Semester Hours:** 3 to 3

PMUS 4612 - Applied Drum Kit

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1612, PMUS 2612, PMUS 3612 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4622 - Applied Oboe

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1622, PMUS 2622, PMUS 3622 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4632 - Applied World Percussion

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1632, PMUS 2632, PMUS 3632 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4642 - Applied Piano

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1642, PMUS 2642, PMUS 3642 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4652 - Applied Jazz Piano

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1652, PMUS 2652, PMUS 3652 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4662 - Applied Saxophone

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1662, PMUS 2662, PMUS 3662 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4672 - Applied Synthesizer

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1672, PMUS 2672, PMUS 3672 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4682 - Applied Trombone

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1682, PMUS 2682, PMUS 3682 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4692 - Applied Trumpet

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1692, PMUS 2692, PMUS 3692 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4702 - Applied Violin

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1702, PMUS 2702, PMUS 3702 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4712 - Applied Viola

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1712, PMUS 2712, PMUS 3712 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4722 - Applied Cello

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1722, PMUS 2722, PMUS 3722 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4732 - Applied Voice

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1732, PMUS 2732, PMUS 3732 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4742 - Applied Tuba

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1742, PMUS 2742, PMUS 3742 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4762 - Applied Euphonium

Private music lessons for audition-based music majors. Lessons emphasize perfecting musical technique, memorizing professional-level repertoire, demonstrating an expert level of musicality, analyzing repertoire, achieving a musical identity, cultivating superior performance practice and preparing and performing a senior recital. Note: Students must be accepted as an audition-based music major. Instructor permission. Coreq: PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson credits. Prereq: PMUS 1762, PMUS 2762, PMUS 3762 (two semesters each), and successful completion of Junior Recital. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4772 - Applied Singer/Songwriter

This is a 2-credit course consisting of one-on-one, hour-long weekly lessons in songwriting and performance skills. Aspects of transcription, analysis, and career development will be incorporated. Plan Code: MUSC-BS SWR; Co-requisites - PMUS 1500, enrollment in an ensemble and at least 7 non-applied lesson. Max hours: 4 Credits. **Semester Hours:** 2 to 2

PMUS 4840 - Independent Study: PMUS

Max hours: 3 Credits. **Semester Hours:** 1 to 3

PRNU 2939 - Internship

Pre-Health internship offering students an opportunity to obtain hands-on experience in a clinical setting; will not apply to the Biology major. Involves application of technical concepts and skills in supervised allied health environment, such as a hospital or medical clinic. Note: May not be used as an upper-division elective. Prereq: One year of general biology with a grade of 'C' (2.0) or higher, junior standing, and a GPA of 2.75 or higher. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PRNU 3939 - Internship

Pre-Health internship offering students an opportunity to obtain hands-on experience in a clinical setting; will not apply to the Biology major. Involves application of technical concepts and skills in supervised allied health environment, such as a hospital or medical clinic. Note: May not be used as an upper-division elective. Prereq: One year of general biology with a grade of 'C' (2.0) or higher, junior standing, and a GPA of 2.75 or higher. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 1001 - Introduction to Political Science: The Quest for Freedom and Justice

Introduces the study of politics, its human importance, and its relationship to social institutions. Analysis of the relationship between individual political behavior and characteristics of the political system. Development of key concepts such as power, legitimacy, authority, political socialization, and revolution. Note: Required of all PSCI majors. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS1 **Semester Hours:** 3 to 3

PSCI 1101 - American Political System

General introduction to the American political system with emphasis upon citizen involvement, the relationships among the various levels and branches of government, formal and informal institutions, processes, and behavior. Note: Required of all PSCI majors. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS1 **Semester Hours:** 3 to 3

PSCI 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 2001 - Topics in Political Science

Covers different areas of politics. Note: May be taken more than once for credit when topics vary. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSCI 2006 - Global Political Issues

Studies global political issues, exploring the broad forces at play in the world: international economics, national interests, military power, nationalism, ethnicity, the environment and human rights. Discussion of world events and underlying global issues, incorporating analytical tools used by political scientists. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 2840 - Independent Study

An opportunity for lower division students who demonstrate academic potential to pursue the study of some subject of interest in greater detail, with supervision from a faculty member in the department. Subjects chosen and arrangements for assignments to be made between student and faculty. Prereq: One semester of course work at Downtown Denver Campus. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 3000 - Topics: Conference Participation

Max hours: 1 Credit. **Semester Hours:** 1 to 1

PSCI 3002 - Topics in Political Science

Covers different areas of politics. Note: May be taken more than once for credit when topics vary. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSCI 3011 - Research Methods

Design of political/social research, both qualitative and quantitative. Applications of statistical techniques and procedures to social and political phenomena. Use of computer and the Internet. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3022 - Introduction to Comparative Politics

Comparison of the basic political features of selected countries with focus on political behavior, institutions and political cultures. Themes examined include development, democratization, social movements, political instability and globalization. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3034 - Race, Gender, Law and Public Policy

Historical overview of race and gender relations in the U.S. and an examination of the treatment of issues of race and gender in the judicial system and public policy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3035 - Political Movements: Race and Gender

Examines the emergence, growth, and decline of social movements for race and gender equality. Discussion of political issues of race and gender in the 1990s. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3042 - Introduction to International Relations

Basic background and theories of international relations with focus on the interaction between nation states, international organizations, regimes and transnational movements. Themes examined include foreign policy conduct, international security and political economy, human rights and environmental management. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3050 - Islamophobia

Islamophobia depicts Islam and its followers as threats to civilization, human rights and progress. Course examines historical and current Islamophobia, including impacts on international relations and on domestic politics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3064 - Power and Empowerment in the United States

Introduces U.S. political economy. Analysis of the political and economic forces and structures that shape the opportunities available to the American people. Among topics included are reciprocal impacts of government and business, the federal budget, taxation, lobbying and special interests, community organizing, and elections. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3075 - Community Organizing and Community Development

Engages the history, theory and skills of community organizing and development. An essential question guiding the course is, "How do we become ethical agents of change?" Students answer this question through rigorous study, development and application of the theory and practice of community organizing and development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3214 - Federal Law and American Indians

Examines the legal and political history of the U.S. in relation to American Indian Nations. Focuses on specific laws and Supreme Court cases in federal Indian law, with analysis of U.S. policy. There will be some comparison with Indian policies of other countries. Cross-listed with ETST 3216. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3333 - Utopian Transformations

Explores cutting-edge theory and practice in social change that transcends traditional left-right divisions and merely incremental reform. Utopian and transformative experiments studied include communes, worker cooperatives, neighborhood organizing, and green parties. Note: Service-learning option can fulfill major requirement. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3347 - Film and Politics

Presents historical and contemporary films to introduce students to critical evaluation of film as a political medium. Whether designed as propaganda or entertainment, films shape and reflect critical issues in our political and social culture. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3840 - Independent Study: PSCI

Max hours: 6 Credits. **Semester Hours:** 1 to 3

PSCI 3914 - The Urban Citizen

Course emphasis is community, the individual, and the good life. Experiential learning and classroom discussions about capacities of urban citizens. Focus is on social, political, and economic resources that individuals command, issues of equality and inequality, and possibilities of constructive change. Prereq: A willingness to spend a semester working and studying together as a team in both the classroom and the community. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 3939 - Internship

Designed experiences involving application of political concepts and skills in supervised employment situations. Prereq: Junior or senior standing and 3.0 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSCI 4002 - Topics in Political Science

Specialized areas of politics. Note: May be taken more than once for credit when topics vary. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 12 Credits. **Semester Hours:** 3 to 3

PSCI 4009 - Politics of the Budgetary Process

Develops each student's understanding of budgeting and financial management in the public and nonprofit sectors. An overview of public sector and nonprofit fiscal management is provided, along with thorough exploration of the political influences that affect financial decision-making. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4011 - GIS in Political Science

Computer lab course developing methodological skills in Geographic Information Systems (GIS) in political contexts. Geospatial computerized mapping skills are important in political fields such as urban planning, electoral analysis, environmental justice, demographics, public health, and criminal justice. Designed for beginners. Cross-listed with PSCI 5011. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4014 - Media and Politics

Explores the impact of the news media on the American political system, including public policy and citizen participation, and addresses trends in news coverage and media ownership, and their impact on public opinion. Prereq: PSCI 1001 and 1101 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4024 - State Politics: Focus Colorado

Examination of American state politics, with an emphasis on Colorado. Course examines the special role of state governments in the American federal system. Focus on dominant current issues facing Colorado state government. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4025 - Local Governance and Globalization

Introduces international political economy, consequences of globalization for localities, interplay between wealth and power among nations, multinational corporations, NGOs and the UN, and impact of their actions on local governments. Topics include development, aid, trade, outsourcing, eco-sustainability and global equity. Prereq: Graduate standing or permission of instructor. Cross-listed with PSCI 5025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4034 - Political Parties and Pressure Groups

Democrats, Republicans, third parties, and pressure groups in the United States. Analysis of pressure politics and political behavior. Impact of parties and pressure groups on the public good. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4044 - The Presidency

An overview of the historical, constitutional, and functional aspects of the presidency. Focuses on the powers and vulnerabilities of the presidency and on the style and politics of the current president. Prereq: PSCI 1101. Cross-listed with PSCI 5044. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4057 - Religion and Politics

Exploration of: (1) theoretical perspectives on the relationship between religion and politics; (2) causes of and justifications for the historical development of the Western separation of "church and state;" (3) contemporary responses to and analyses of this separation; and (4) several current debates about public policy in America that reveal tensions between these two spheres. Cross-listed with PSCI 5057 and RLST 4500, 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4074 - Urban Politics

The crisis and the promise of U.S. cities. Nature and roots of critical urban problems. Citizen involvement in urban decision making. Government as problem and as solution. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4084 - Local Government and Administration

Policy and administrative challenges faced by local government in the 21st century. Emphasis on cities under federalism, alternative forms of city governance, and new challenges from increasingly diverse constituents. Issues of poverty, public safety, health, transportation, environment, corruption, and accountability. Cross-listed with PSCI 5084. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4085 - Comparative Governance: Environment and Society

Focuses on how public & private actors at various levels of governance address pressing social & environmental issues such as aging societies, drug abuse, air pollution & global warming. Students will learn to analyze the dynamics of conflict & cooperation, using main concepts and theories of governance literature. Cross-list PSCI 5085. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4094 - Seminar: American Politics

Foundations of U.S. politics and contemporary political issues. Federal/state/community relations. Relationship among the three branches of the Federal government. Colorado controversies arising under the U.S. Constitution. Cross-listed with PSCI 5014. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4105 - Comparative Politics: Europe

An intensive and comparative analysis of the political systems and processes of Europe. Emphasis on political culture and economy; executive-legislative relationships; electoral systems; political parties and interest groups; political conflict and citizen participation; and the impact of social changes on political institutions. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with PSCI 5105. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4115 - Third World Politics

Examines the factors challenging political stability in low income nations and the prospects for democracy and economic development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4124 - Denver Politics

Surveys Denver's dominant political and economic forces and community agendas that compete with the downtown growth machine. Examines urban renewal strategies, gentrification and grass-roots resistance, and the role of officials in shaping Denver's distribution of wealth and life-opportunities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4126 - Introduction to International Political Economy

A short introduction to international economy, including classic readings of international political economy (such as Smith, Ricardo, Marx, Lenin), and more recent work on globalization, applying related theories to the current world economy. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PSCI 4144 - Indigenous Political Systems

Surveys political theory and practice in indigenous societies in the Americas. Examines the impact of indigenous political thought on Euro-American politics, especially the U.S. Constitution, and explores the contemporary impact of indigenous people on current politics. Cross-listed with ETST 4144. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4146 - Indigenous Politics

Surveys the status of the world's native peoples and nations, and the role of law and politics in the future of indigenous peoples in the global arena. Examines questions of human rights, economic development, and international law and politics. Prereq: PSCI 1001. Cross-listed with PSCI 5145 and ETST 4146. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4155 - Political Systems of the Middle East and North Africa

Comparative analysis of political processes in the Middle East and North Africa. Islamic political theory and its contemporary manifestations. The role of nationalism and the quest for modernity in the political development of this region. Parties and programmed modernization in transitional politics. Violent and nonviolent change. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4156 - The Arab-Israeli Peace Process

Critical analysis of Arab and Israeli perspectives on the on-going peace negotiations in the Middle East. Historical background and religious-cultural aspects of current problems. Note: This course may count for the International

Studies major or minor. See your INTS advisor for more information. Prereq: Upper division standing. Cross-listed with ETST 4156. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4165 - Islamic Politics and Culture

Comprehensive, in-depth study of Islam and Muslims. Islam is viewed as a "way of life" with social, economic, psychological, spiritual, and political implications. Among topics to be examined are: women in Islam, Jihad, fundamentalism, Islamic movements, Islam and the West. Cross-listed with RLST 3100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4176 - Gandhi's Legacy: Non-Violent Resistance Today

This course assesses the legacy of Gandhi's nonviolent struggle against systemic oppression. We examine Gandhi's ideas and practices, consider Western images of political violence, and then focus on questions and possible answers raised by empirical studies. Prereq: This course is restricted to students with junior standing or higher (completed 60 credits). Cross-listed with PSCI 5176. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4185 - Corruption in the U.S. and Abroad

Explores the causes and consequences of administrative and political corruption in developed and developing countries, and evaluates various anti-corruption strategies. Prereq: PSCI 1001 or 3022. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4186 - East Asia in World Affairs

Political and economic systems and foreign policies of East Asian powers, such as China, Japan, Taiwan, South Korea and Hong Kong; interactions of these powers and their collective economic and political roles in world affairs; major theoretical approaches to the study of East Asian powers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4195 - Political Systems of Sub-Saharan Africa

Analysis of major types of political systems in sub-Saharan Africa and intensive case studies of selected countries exemplifying each type. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4206 - Social Movements, Democracy and Global Politics

Examines global social movements as new political actors within world politics; how theoretical perspectives in international relations and democracy address these actors; and the forms of interaction among these actors, states, and global governance institutions. Cross-listed with PSCI 5206. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4207 - Theories of Social and Political Change

Conservative, radical, and incremental approaches to change. Role of psychological and sociological factors in political

change. Comparative perspectives on change. Self-perpetuation processes of power systems and their vulnerabilities. Requisites of system maintenance and system change. Selected case studies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4215 - Women's Rights, Human Rights: Global Perspectives

Explores the global feminist movement's campaign to "engender" human rights. Examination of women's human-rights issues and the critique of this campaign as representing cultural imperialism. Prereq: Six hours of political science or instructor permission. Cross-listed with WGST 4215. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4216 - International Politics: Human Rights

The system of nation states, concepts of national interest, goals of foreign policies, conduct of diplomacy, and the bearing of these elements on the problem of human rights. Presentation and evaluation of the solutions that have been offered for the securing of justice and the maintenance of peace. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4224 - Dictatorships in 21st Century

Analyzes and classifies political systems of non-democratic regimes. Reviews earlier and contemporary theories that explain the origins, survival and death of authoritarian regimes. Discusses the impact of dictatorial rule on domestic developments as well as on international relations. Cross-listed with PSCI 5224. PSCI 3022 recommended for student success. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4225 - Democracy and Democratization

Examines the conditions under which countries turn from authoritarianism towards democracy and become stable democratic regimes. Also examines the impact of foreign and international factors on new democracies. Cross-listed with PSCI 5225. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4226 - The United Nations in World Affairs

Current operation and future potential of the United Nations as a complex actor in world affairs, both expressing conflicting interests of its participants and promoting universal goals, including world peace, human rights, and environmental protection. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4235 - Politics and Markets in Latin America

Explores political economic development in Latin America within the context of the world system. Includes the study of colonization, land tenure, foreign investment, authoritarianism, militarism, social and revolutionary movements, human rights and democratization. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PSCI 4236 - American Foreign Policy

Examines the postwar events, controversies, and most recent challenges in U.S. foreign policy. Analyses of the major sources of U.S. foreign policy, such as ideology, national interests, and national power. Attention to the pattern and process of foreign policy-making. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4237 - American National Security

Examines American national security, utilizing an interdisciplinary analysis of its domestic historical development and its function in the current global context. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4248 - Gender, Globalization and Development

Analyzes the effects of globalization on the gendered processes of international development and strategies to empower women to achieve gender justice across race, class and national divisions. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with PSCI 5245 and WGST 4248/5248. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4265 - Social Justice And Globalization

Examines issues of justice and ethical responsibility in a globalizing world. Do moral obligations of individuals and institutions end at national borders or do they encompass all human beings and extend to the environment and to future generations? Cross-listed with PSCI 5265. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4266 - International Law

Investigates the body of law that regulates relations between nations and provides a framework for solving common problems and disputes between nations. Prereq: Upper division political science major. Cross-listed with PSCI 5266. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4274 - Conflict Resolution and Public Consent Building

Alternative strategies for resolving or mediating conflicts facing public or nonprofit organizations and for building public consent, with emphasis on personal, interpersonal, organizational, interest-group, cross-cultural, and roots of conflict and bases for consent. Cross-listed with PSCI 5274. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4276 - Conflicts and Rights in International Law

Explores contending interpretations and practices in international law regarding issues such as the legitimacy of humanitarian intervention, efficacy of truth commissions, tensions between truth and justice in cases of genocide and war crimes, and legal changes needed to devise viable rules. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with PSCI 5276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4280 - The Politics of War Law

Examines international laws governing armed conflict, including human rights law. Investigates the reasons for instances of compliance and violation within this international legal regime regulating war and conflict. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4286 - International Relations: War or Peace?

Presents alternative theoretical frameworks for the explanation of war and peace. Investigations of the efficacy of international law, just-war norms and the UN in preventing or containing conflict. Prereq: PSCI 1001. Cross-listed with PSCI 5286. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4324 - Politics, Public Policy and Leadership

Role of politics in public and nonprofit sectors. Theories of administration and policy-making, emphasizing the role of leadership in public outcomes. Hands-on approach to case studies and use of students' policy experiences in practical application of theories. Cross-listed with PSCI 5324. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4326 - Advanced International Political Economy: Globalization

Engages the current debate about globalization. Conceptualizes globalization and evaluates the pros and cons of global trade and finance for developed and developing countries. Develops a model for a sustainable and just global economy. Prereq: PSCI 4126. Cross-listed with PSCI 5326. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PSCI 4330 - U.S. Health Policy

The role of public health policy as legislated at the federal and state levels. Individual health policy (e.g. social security and managed care) and public health policy (e.g. mandatory immunizations, HIV testing, air and water quality). Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4354 - Environmental Politics

Political, legal, and economic forces in environmental law and policy. Special emphasis on air and water pollution and on threats to public and agricultural land. Environmental groups and their opponents. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4365 - Global Ecological Crises

Overview of global ecological problems such as climate change, transboundary pollutions, and loss of bio-diversity in an attempt to understand the political, economic, and cultural forces behind these problems and the status of legal and policy initiatives to address them. Cross-listed with PSCI 5365. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4374 - Public Priorities for the 21st Century

Identification of and planning for social, political, and economic trends in American society likely to transform governmental, nonprofit, and private entities. Rigorous examination of and debate on competing priorities such as liberty, security, welfare, equality, diversity, growth and ecology. Cross-listed with PSCI 5374. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4407 - Early Political Thought

Main currents of political thought in their historical setting from Plato to Machiavelli, with a critical evaluation of those elements of continuing worth. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4414 - Organizational Change Agents

Explores strategies for changing public and nonprofit organizations and of ways leadership abilities can be used for this purpose. Analysis of obstacles to organizational change and of methods for overcoming them. Principles of change applied to real-life contexts. Cross-listed with PSCI 5514. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4417 - Modern Political Thought

Main currents of political thought in their historical setting from the 17th century to the present. Development of the student's own political theory. PSCI 4407 is not a prerequisite for PSCI 4417. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4427 - Law, Politics and Justice

Analysis of the relationship of politics, law, and justice, particularly the degree to which moral norms and political concerns should and do influence legal standards and their perceived legitimacy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4437 - Coercion and the State

An analysis of: (1) the historical emergence of the modern state; (2) the theoretical justifications for the concentration of political power and the activist state; (3) the internationalization of the European state system; and (4) anarchist and Fourth World challenges. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4444 - Contemporary Culture and Politics in America

Intellectual and experiential investigation of the interplay of culture and politics in American society, as manifested in literature, social and political philosophy, psychological writings and trends, radical movements, popular culture, and daily behavior. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4446 - Advanced Indigenous Peoples' Politics

Builds upon the theoretical and applied foundations of PSCI 4146. Intensive study of international legal and political developments are examined, particularly in the United Nations and the Organization of American States systems. Prereq: PSCI 4144 or 4146 or permission of instructor. Cross-listed with PSCI 5446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4457 - American Political Thought

American law, politics, and conflict. History and development of American political theories and ideas from Native American roots through the colonial period to the present. Political theory and practice in the U.S. today. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4477 - Constitutional Law I

Nature and scope of the following American constitutional principles as developed by the U.S. Supreme Court: federalism, jurisdiction of the federal courts, separation of powers, the taxing power, and the commerce power. Case method. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4487 - Constitutional Law II

Continuation of PSCI 4477, with emphasis on the war powers of the president, citizenship, the Bill of Rights, and the Civil War amendments. (Case method.) Note: PSCI 4477 is not a prerequisite for PSCI 4487. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4494 - Judicial Politics

Examines principal actors in the legal system: police, lawyers, judges, citizens. About half of this course is devoted to the study of judicial behavior, especially at the Supreme Court level. Political and personal influences on judicial behavior. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4505 - Political System of Russia and Its Neighbors

The class focuses on the political values, institutions and actors of Russia and its neighboring countries, covering the political developments since the late 20th century. The relations between Russia, the European Union and the United States are also analyzed. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4535 - Labor and Working Class Politics

Explores the status of the labor movement both in the U.S. and internationally, as well as the political, philosophical, and social implications of socioeconomic class status and identity. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4545 - Immigration Politics

Introduces students to central theories of migration and a survey of immigration law and policy in the 20th century. Highlights experiences of Mexican and Latin American immigrants and related topics, including: U.S.-Mexican foreign relations, bilingual education, undocumented immigration and globalization. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with PSCI 5545. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4554 - Chicano and Latino Politics

Analysis of the social, cultural, and economic factors that affect political behavior of Latinos. Special attention is paid to the Mexican American cultural heritage and to relations between Mexican Americans and Anglo Americans. Cross-listed with ETST 4558. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4555 - International Women's Resistance

Examines local and international struggles of women to build peace and justice by resisting systems of inequality such as colonialism, racism, patriarchy, globalization, and religious intolerance. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with PSCI 5555, ETST 4555 and WGST 4555/5555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4564 - Gender and Politics

Analysis of the political experience of women and of strategies for change. Emphasis on the U.S. Cross-listed with WGST 4564. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4605 - Politics and Governments of South Asia

Studies the political systems of Bangladesh, India, Pakistan, Sri Lanka and Nepal. The impact of British rule on the development of political institutions on the subcontinent as well as problems of political development at all levels. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4615 - Politics and Government of China

Political and governmental changes within China, from the 19th century to the present. Primary emphasis on contemporary political systems and sociopolitical problems. China's struggle for independence and economic development. The Chinese revolutions, Maoist communism, and the post-Maoist period. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4644 - Ethical Responsibilities of Leaders

Explores concepts of ethical decision making within the context of public leadership in both the public and non-profit sectors. Universal and individual ethical standards are examined. Cross-listed with PSCI 5644. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4645 - Comparative Political Leadership

Comparative study of historical, socio-cultural, and psychological bases of political leadership. Leadership types in peasant societies, empires, and revolutionary movements. Dilemmas of democratic versus authoritarian leadership in modernizing and industrial states. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4726 - Seminar on U.S. and China Relations

Detailed examination of historical context and current issues in U.S./China relations. Emphasis on modern period, with particular attention to changing relations in context of rising power of China. Cross-listed with PSCI 5726. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4736 - The Middle East in World Affairs

Evolution and revolution in the Middle East. The character of nationalism in the area. Analysis of inter-regional and international problems affecting the Middle East, with special emphasis on current Arab-Israeli relations. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4757 - Legal Reasoning and Writing

Introduces the fundamentals of legal reasoning and legal argumentation through intensive class discussion, formal debate and writing. Attention is given to the relationship between case and statutory law and their application in trial and appeals courts in the United States. Prereq: ENGL 1020, 2030, and any one 3000-level English/writing course or COMM 3120. Cross-listed with PSCI 5747, COMM 4750, 5750. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4807 - Political Violence

Investigates different types of political violence including genocide, ethnic and religious conflict, revolution, terrorism, war, state repression and others. Introduces theories of individual, collective and institutional violence, applies them to a range of case studies and explores possible solutions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4808 - Strategies of Peacebuilding

The course investigates the theories and strategies of peacebuilding in societies that have endured intrastate conflict and/or massive human rights violations and asks whether peace and justice and democracy can or should work together and how forgiveness and reconciliation might develop. Cross-listed with PSCI 5808. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4827 - Women and the Law

Examines the role of the courts in the development of public policy toward women; how the legal system affects the

economic power, family roles, safety and political participation of women. Cross-listed with ETST 4827 and WGST 4827. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4837 - Contemporary Issues in Civil Liberties

Conflicting rights of individuals and groups in several areas of civil liberties, including religious groups, free speech, sexual freedom, racial quotas, and anti-governmental actions and publications. This course includes case law, readings, guest speakers and case discussions. Cross-listed with PSCI 5837. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4840 - Independent Study: PSCI

An opportunity for advanced students with good scholastic records, and with appropriate courses completed, to pursue independently the study of some subject of special interest to them. Subjects chosen and arrangements made to suit the needs of each student. Note: Primarily for seniors. Prereq: 15 semester hours in political science and permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

PSCI 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PSCI 4934 - CU at the Capitol

Examines current year legislative session of Colorado General Assembly. Study of various elected leaders; Colorado party system; Governor-Assembly relations; citizen and lobbyist influence; corruption and virtue in politics; current affairs. Each student will be placed in a state government internship. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 4995 - Travel Study

Students study various topics at an off-campus location, either a foreign country or another city or region in the United States, led by a Downtown Denver Campus instructor. Prereq: PSCI 1001 or 3022 or permission of instructor. Cross-listed with PSCI 5995. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 5000 - State of the Discipline

Introduces graduate study in political science. Provides an overview of theories and methods in the four fields of American politics, political theory, comparative politics and international relations. Guest lectures by department faculty. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5005 - Political Theory After 9/11

The events of 9/11 brought into sharp focus dilemmas in international politics, including the responses to American

hegemony, return of religion, nature of "terrorism" and implications for democracy. This course explores diverse interpretations of these challenges offered by major political theorists. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5007 - Beyond Political Correctness

Explores and critiques "political correctness" defined as "ideological narrowing, intolerance and silencing of dissent." Analysis of origins, dynamics and consequences of PC with emphasis on its advantages and disadvantages for practitioners. Foundational works, illustrative cases and contemporary voices. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5008 - Graduate Topics in Political Science

Max hours: 12 Credits. **Semester Hours:** 1 to 3

PSCI 5009 - Politics of the Budgetary Process

Explores budgeting and financial management in the public and nonprofit sectors. An overview of public sector and nonprofit fiscal management is provided, along with thorough exploration of the political influences that affect financial decision-making. Note: Offered as a special topics course in an intensive three-weekend format, which is reflected in the syllabus. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5011 - GIS in Political Science

Computer lab course developing methodological skills in Geographic Information Systems (GIS) in political contexts. Geospatial computerized mapping skills are important in political fields such as urban planning, electoral analysis, environmental justice, demographics, public health, and criminal justice. Designed for beginners. Cross-listed with PSCI 4011. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5013 - Philosophical Problems in the Social Sciences

Explores the fundamentals of the conduct of inquiry; concept formation and theory construction in the social sciences; issues related to value judgments and objectivity, social praxis, human nature and political choice. Cross-listed with SSCI 5013. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5014 - Seminar: American Politics

Foundations of U.S. politics and contemporary political issues. Federal/state/community relations. Relationship among the three branches of the Federal government. Colorado controversies arising under the U.S. Constitution. Cross-listed with PSCI 4094. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5024 - State Politics: Focus on Colorado

Analysis of unique aspects of Colorado government and politics. Political comparison of Colorado with other states. Preparation and discussion of research papers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5025 - Local Governance and Globalization

Introduces international political economy, consequences of globalization for localities, interplay between wealth and power among nations, multinational corporations, NGOs and the UN, and impact of their actions on local governments. Topics include development, aid, trade, outsourcing, eco-sustainability and global equity. Prereq: Graduate standing or permission of instructor. Cross-listed with PSCI 4025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5044 - The Presidency

An overview of the historical, constitutional, and functional aspects of the presidency. Focuses on the powers and vulnerabilities of the presidency and on the style and politics of the current president. Prereq: Graduate status or permission of instructor. Cross-listed with PSCI 4044. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5054 - The Legislative Process

An intensive examination of the structures and interactions through which laws are made in the United States. The major emphasis is the national level, but considerable attention is devoted to state legislatures and local lawmaking bodies. Impact of money and interest groups. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5057 - Religion and Politics

Exploration of: (1) theoretical perspectives on the relationship between religion and politics; (2) causes of and justifications for the historical development of the Western separation of "church and state;" (3) contemporary responses to and analyses of this separation; and (4) several current debates about public policy in America that reveal tensions between these two spheres. Cross-listed with PSCI 4057, and RLST 4500, 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5084 - Local Government and Administration

Policy and administrative challenges faced by local government in the 21st Century. Emphasis on cities under federalism, alternative forms of city governance, and new challenges from increasingly diverse constituents. Issues of poverty, public safety, health, transportation, environment, corruption and accountability. Cross-listed with PSCI 4084. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5085 - Comparative Governance: Environment and Society

Focuses on how public & private actors at various levels of governance address pressing social & environmental issues such as aging societies, drug abuse, air pollution & global warming. Students will learn to analyze the dynamics of conflict & cooperation, using main concepts and theories of governance literature. Cross-list PSCI 4085. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5094 - Seminar: Urban Politics

An intensive analysis and research of major aspects of politics and government in metropolitan areas. Impact of corporations and higher levels of government on cities. Opportunities for, and barriers to, citizen participation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5105 - Comparative Politics: Europe

Examination and writing of research papers on selected topics of industrial democracies, especially those of Europe. Cross-listed with PSCI 4105. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5135 - Seminar: Political Economy of Latin America

Focuses on the political economies and cultures of Latin America. Particular attention is given to the impact of the export-led growth strategy on social and political development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5145 - Indigenous Politics

Surveys the status of the world's native peoples and nations, and the role of law and politics in the future of indigenous peoples in the global arena. Examines questions of human rights, economic development, and international law and politics. Prereq: Graduate status or permission of instructor. Cross-listed with PSCI 4146 and ETST 4146. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5176 - Gandhi's Legacy: Non-Violent Resistance Today

This course assesses the legacy of Gandhi's nonviolent struggle against systemic oppression. We examine Gandhi's ideas and practices, consider Western images of political violence, and then focus on questions and possible answers raised by empirical studies. Prereq: Restricted to graduate students. Cross-listed with PSCI 4176. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5206 - Social Movements, Democracy and Global Politics

Examines global social movements as new political actors within world politics; how theoretical perspectives in international relations and democracy address these actors; and the forms of interaction among these actors, states, and global governance institutions. Cross-listed with PSCI 4206. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5216 - Seminar: International Relations

Introduces contending theories, empirical studies, and research methods in the field. Writing and discussion of comprehensive research papers in the field of international power politics and alternative attempts at controlling conflicts among nations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5217 - Human Rights in Theory and Practice

Explores the ideas of human rights and the practical efforts to actualize rights in society. Students study the theories of rights and the evolution of rights in history, as well as work with a service organization. Cross-listed with PSCI 4217. **Semester Hours:** 3 to 3

PSCI 5224 - Dictatorships in 21st Century

Analyzes and classifies political systems of non-democratic regimes. Reviews earlier and contemporary theories that explain the origins, survival and death of authoritarian regimes. Discusses the impact of dictatorial rule on domestic developments as well as on international relations. Cross-listed with PSCI 4224. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5225 - Democracy and Democratization

Examines the conditions under which countries turn from authoritarianism towards democracy and become stable democratic regimes. Also examines the impact of foreign and international factors on new democracies. Cross-listed with PSCI 4225. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5236 - Seminar: American Foreign Policy

Examines selected methodological and substantive problems. Particular emphasis on elements of national decision making, America's adaptation to the changing world, and opportunities for student contributions through research and discussion. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5238 - Seminar: Comparative Foreign Policy

Examination of the effects of leaders, groups, institutions, strategic cultures and external influences on national foreign policy-making processes and comparative analysis of foreign policy making of great and emerging powers. Prereq: graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5245 - Gender, Globalization and Development

Analyzes the effects of globalization on the gendered processes of international development and strategies to empower women to achieve gender justice across race, class and national divisions. Cross-listed with PSCI 4248 and WGST 4248/5248. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5256 - Seminar: National Question and Self-Determination

Designed to provide students with a broad theoretical and empirical understanding of the causes of ethnic conflicts and to assess different strategies of conflict resolution. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5265 - Social Justice And Globalization

Examines issues of justice and ethical responsibility in a globalizing world. Do moral obligations of individuals and institutions end at national borders or do they encompass all human beings and extend to the environment and to future generations? Cross-listed with PSCI 4265. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5266 - International Law

Investigates the body of law that regulates relations between nations and provides a framework for solving common problems and disputes between nations. Prereq: Upper division political science major. Cross-listed with PSCI 4266. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5274 - Conflict Resolution and Public Consent Building

Alternative strategies for resolving or mediating conflicts facing public or nonprofit organizations and for building public consent, with emphasis on personal, interpersonal, organizational, interest-group, cross-cultural, and roots of conflict and bases for consent. Cross-listed with PSCI 4274. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5276 - Conflicts and Rights in International Law

Explores contending interpretations and practices in international law regarding issues such as the legitimacy of humanitarian intervention, efficacy of truth commissions, tensions between truth and justice in cases of genocide and war crimes, and legal changes needed to devise viable rules. Cross-listed with PSCI 4276. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5286 - International Relations: War or Peace?

Presents alternative theoretical frameworks for the explanation of war and peace. Investigations of the efficacy of international law, just-war norms and the UN in preventing or containing conflict. Prereq: Graduate status or permission of instructor. Cross-listed with PSCI 4286. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5324 - Politics, Public Policy and Leadership

Role of politics in public and nonprofit sectors. Theories of administration and policy-making, emphasizing the role of leadership in public outcomes. Hands-on approach to case studies and use of students' policy experiences in practical application of theories. Cross-listed with PSCI 4324. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5326 - Advanced International Political Economy: Globalization

Engages the current debate about globalization. Conceptualizes globalization and evaluates the pros and cons of global trade and finance for developed and developing countries. Develops a model for a sustainable and just global economy. Cross-listed with PSCI 4326. Max hours: 6 Credits. **Semester Hours:** 3 to 3

PSCI 5354 - Seminar: Environmental Politics and Policy

Consideration of competing models of the policy process in natural-resources decision making. Focus on selected case studies. Impact of environmental and pro-growth forces on the political process. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5365 - Global Ecological Crises

Overview of global ecological problems such as climate change, transboundary pollutions, and loss of bio-diversity in an attempt to understand the political, economic, and cultural forces behind these problems and the status of legal and policy initiatives to address them. Cross-listed with PSCI 4365. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5374 - Public Priorities for the 21st Century

Identification of and planning for social, political, and economic trends in American society likely to transform governmental, nonprofit and private entities. Rigorous examination of and debate on competing priorities such as liberty, security, welfare, equality, diversity, growth and ecology. Cross-listed with PSCI 4374. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5414 - Organizational Change Agents

Explores of strategies for changing public and nonprofit organizations and of ways leadership abilities can be used for this purpose. Analysis of obstacles to organizational change and of methods for overcoming them. Principles of change applied to real-life contexts. Cross-listed with PSCI 4414. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5417 - Seminar: Practical Utopias

Explores of utopian theories applied in real-world experiments and political movements, including communes, worker cooperatives, neighborhood organizing and Green parties. One or more field trips and a final retreat during which the class will develop its own practical-utopian model(s). Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5446 - Advanced Indigenous Peoples' Politics

Builds upon the theoretical and applied foundations of PSCI 4146. Intensive study of international legal and political developments are examined, particularly in the United Nations and the Organization of American States systems. Prereq: PSCI 4144 or 4146 or permission of instructor. Cross-listed with PSCI 4446. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5457 - Seminar: American Political Thought

An intensive research in and presentation of competing ideas in the development of American political thought and practice, beginning with those of the Iroquois Confederacy and the founders of the United States Constitution. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5468 - Research Methods in Political Science

Analysis and evaluation of research methods, techniques, and empirical materials in political science application to Internet research. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5477 - The U.S. Constitution: Law and Politics

An intensive analysis of the most recent doctrinal developments in the areas of federal jurisdiction, federalism, separation of powers, commerce, taxing and war powers, civil liberties and civil rights. Prereq: PSCI 4477 or 4487 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5545 - Immigration Politics

Introduces students to central theories of migration and a survey of immigration law and policy in the 20th century. Highlights experiences of Mexican and Latin American immigrants and related topics, including U.S.-Mexican foreign relations, bilingual education, undocumented immigration and globalization. Cross-listed with PSCI 4545. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5555 - International Women's Resistance

Examines local and international struggles of women to build peace and justice by resisting systems of inequality such as colonialism, racism, patriarchy, globalization, and religious intolerance. Prereq: Graduate status or permission of instructor. Cross-listed with PSCI 4555, WGST 4555/5555 and ETST 4555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5610 - Seminar: Middle East Politics

Examines the Middle East regional system and the region's role in world politics. Investigates questions regarding politics in Iran, Iraq, Palestinian-Israeli relations, political Islam, and relations with the United States. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5615 - Seminar: Chinese Development

Discussion of readings about China. Analysis of several of the following: party-government relations, ideology and political behavior, leadership, diplomacy, political and economic development and post-Mao reforms. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5644 - Ethical Responsibilities of Leaders

Explores concepts of ethical decision making within the context of public leadership in both the public and non-profit sectors. Universal and individual ethical standards are examined. Cross-listed with PSCI 4644. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5726 - Seminar on U.S. and China Relations

Detailed examination of historical context and current issues in U.S./China relations. Emphasis on modern period, with particular attention to changing relations in context of rising power of China. Cross-listed with PSCI 4726. Prereq: Graduate status or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5747 - Legal Reasoning and Writing

Introduces the fundamentals of legal reasoning and legal argumentation through intensive class discussion, formal debate and writing. Attention is given to the relationship between case and statutory law and their application in trial and appeals courts in the United States. Cross-listed with PSCI 4757, COMM 4750, 5750. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5807 - Seminar: Conflict Behavior and the Politics of Violence

Theoretical and empirical analysis of conflict behavior with special emphasis on the explanation of political violence. Revolution, international warfare, and urban unrest are studied as forms of political violence, and the role of systematic empirical research is emphasized in the development of general theories of intergroup conflict. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5808 - Strategies of Peacebuilding

The course investigates the theories and strategies of peacebuilding in societies that have endured intrastate conflict and/or massive human rights violations and asks whether peace and justice and democracy can or should work together and how forgiveness and reconciliation might develop. Cross-listed with PSCI 4808. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5827 - Seminar: Political Psychology

Role of personality variables in political attitudes, behavior, and system maintenance and change; human nature as a parameter; political relevance of psychoanalytic, behaviorist, humanistic and social psychology; alienation, ethnocentrism, dogmatism, and aggression as political variables. Prereq: Political science or psychology background. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5837 - Contemporary Issues in Civil Liberties

Conflicting rights of individuals and groups in several areas of civil liberties, including religious groups, free speech, sexual freedom, racial quotas, and anti-governmental actions and publications. This course includes case law, readings, guest speakers and case discussions. Cross-listed with PSCI 4837. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5840 - Independent Study: PSCI

Max hours: 6 Credits. **Semester Hours:** 1 to 3

PSCI 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PSCI 5914 - Community Development

The theory and practice of community-sensitive development. Global forces challenge communities, alternatively, with floods and droughts of international capital. By collaborating with a non-profit community-based organization, this class examines how communities develop progressive methods of engaging global forces. Prereq: Graduate standing or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

PSCI 5944 - CU in the City

Investigation of community development strategies through seminar discussions, urban walking tours, and student field placement with a local community based organization, non-profit, or public office engaged in community development work. Cross-listed with PSCI 4944. Prereq: Graduate standing or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSCI 5950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

PSCI 5960 - Master's Project

Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 5995 - Travel Study

Students study various topics at an off-campus location, either a foreign country or another city or region in the United States, led by a Downtown Denver Campus instructor. Prereq: PSCI 1001 or 3022 or permission of instructor. Cross-listed with PSCI 4995. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSCI 6840 - Independent Study: PSCI

Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSYC 1000 - Introduction to Psychology I

Introduces the scientific study of behavior, including an overview of the biological basis of behavior, sensation or perception, states of consciousness, learning and memory, thinking and language, intelligence, motivation and emotion. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3 **Semester Hours:** 3 to 3

PSYC 1005 - Introduction to Psychology II

Introduces the scientific study of behavior, including an overview of the history of psychology, development, personality, psychological disorders, therapy, health psychology and social behavior. PSYC 1000 is not a prerequisite for this course. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3 **Semester Hours:** 3 to 3

PSYC 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSYC 2050 - Improving Memory

Applies psychological principles of memory function and process to everyday settings and experiences. Covers topics such as how memory works, principles of memory improvement, and strategies for effective learning. Max hours: 2 Credits. **Semester Hours:** 2 to 2

PSYC 2060 - Psychology Applied to Everyday Life

A primer in psychological principles applied to everyday situations. Covers topics such as learning, stress and health, attraction and love, and personality. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 2090 - Statistics and Research Methods

Introduces statistics and research methods in the field of psychology. Note: Intended for those who plan to major in psychology. Completion of college algebra or equivalent is recommended. Prereq: PSYC 1000. Max hours: 4 Credits. **Semester Hours:** 4 to 4

PSYC 2220 - Biological Basis of Behavior

Introduces the biological basis of behavior. This course will feature concepts like neurons, synaptic and hormonal transmission, and physiological set-points. Behavior of simple (invertebrate) and complex organisms (vertebrates) will be related to the activity of specific brain neural networks. Prereq: PSYC 1000 or BIOL 2051. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2 **Semester Hours:** 3 to 3

PSYC 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: 15 hours of 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSYC 2990 - Topics in Psychology

Studies special topics to be selected by the instructor. Note: May be repeated for credit. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSYC 3050 - Decision Making

This course discusses current research on decision making/behavioral economics, as well as its application to individual well-being and public policy. You will gain insights on how and why people can be irrational in their daily decisions. Max hours: 3 Credits. Cross-listed with PBHL 3050 and ECON 3050. **Semester Hours:** 3 to 3

PSYC 3090 - Research Methods in Psychology

Covers principles of experimental methodology in Psychology. Includes active participation in data collection and interpretation, presentation of results, evaluation of scientific literature, scientific writing and advanced statistical concepts as they relate to the field of Psychology. Prereq: PSYC 1000, 1005 and 2090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3104 - Behavioral Genetics

Interdisciplinary course on relationships between behavior and heredity, with emphasis on human behavioral genetics. Prereq: General biology or general psychology. Cross-listed with BIOL 3104. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3144 - Human Cognition

Studies information processing in humans, with emphasis on memory, thinking and language. Prereq: PSYC 1000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3145 - Industrial and Organizational Psychology

Surveys the fields of industrial and organizational psychology. These fields apply psychological principles to improving productivity and satisfaction in the workplace. Topics include motivation, leadership, group processes, team functioning, occupational health, selection and training of employees, and performance management. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3205 - Human Development I: Child Psychology

Studies human development covering birth, infancy, toddler, preschool and school-aged child. Covers biological, cognitive and social processes. Prereq: PSYC 1000 or 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3215 - Human Development II: Adolescence and Adulthood

Study of human development from adolescence through adulthood and aging. Covers biological, cognitive, and social processes. Prereq: PSYC 1000, or PSYC 1005, or PSYC 3205 must be complete before students can enroll. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3222 - Principles of Learning and Behavior

Introduces the scientific study of learning and behavior, focusing on "Behaviorism." Principles of operant and classical conditioning are discussed. A particular emphasis is placed on the relevance and application of these principles to understanding human behavior and psychopathology. Prereq: PSYC 1000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3235 - Human Sexuality

Examines the physiological, psychological, and social psychological bases of human sexuality. Research on the range of sexual behaviors, individual sexual response, sexual development, sexual dysfunction, and variants of sexual orientation. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3254 - Introduction to Animal Behavior

Surveys the behavior of nonhuman animals, emphasizing the evolution through natural selection. Prereq: One semester of general biology, biological anthropology, or other course emphasizing evolutionary perspective. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3262 - Health Psychology

An overview of the scientific study of attitudes, behaviors, and personality variables related to health and illness. Emphasis is on the interaction of biological, psychological, and social factors that cause illness and influence its treatment and prevention. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3263 - Hormones and Behavior

The hormonal regulation of behavior will be the primary focus of this course. Topics include: hormonal basis of sexual differentiation and behavioral differences, parental behavior, biological rhythms, aggression, mood and stress. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3265 - Drugs, Brain and Behavior

Explores the pharmacological, biological, and behavioral basis of drug effects. Topics include mechanisms of drug action, brain reward pathways, role of environment and history on drug effects, and the impact of science on drug abuse and medication development. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3305 - Abnormal Psychology

This course applies a scientific approach to the examination of the symptoms, etiologies, and treatments of mental illnesses, including disorders of mood, anxiety, stress, addictions and those seen in childhood and older age. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3385 - Psychology of Mindfulness

This course will explore significant psychological, neurological, historical, societal and cultural aspects of mindfulness. It will integrate this current knowledge with more traditional aspects of the concept through classroom activities, guest lecturers, projects and field trips. Prereq: PSYC 1000 or 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3405 - Family Psychology

Overview of theory and research pertaining to marital and family structure, functioning and dynamics. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3415 - Experimental Social Psychology

Surveys the field of Social Psychology, the study of the way in which cognitions, emotions, and behaviors are influenced by the presence, or perceived presence, of others. Heavily focuses on experimentation and experimental methods within the field of Social Psychology. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3505 - Psychology and the Law

Examines the legal and extralegal applications of psychology, such as assessment of insanity and competence, psychologists as expert witnesses, accuracy of eyewitness accounts, and issues relating to employment discrimination. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3600 - Topics in Psychology

Studies special topics to be selected by the instructor. Note: May be repeated for credit. Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSYC 3610 - Psychological Trauma

Overview of psychological trauma, including: history, theoretical application, trauma models, diagnosis and treatment

implications. Topics include family violence, child abuse, sexual abuse, and the trauma of war. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3611 - Psychology of Women

Reviews psychological theories and research of women's social, cultural, emotional and behavioral experience. Examines the sociocultural context of women's experience and explores women's socialization, developmental issues, cognitive abilities and achievement motivation, personality variables, stereotypes, psychological disorders, victimization, intimacy and sexuality. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3612 - Domestic Abuse

Examines the nature and extent of domestic violence. Personal characteristics and dynamics that contribute to spouse abuse are reviewed. Theories and research in the general field of family violence, victims' and perpetrators' treatment, and child abuse are discussed. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3615 - Positive Psychology

This course provides an introduction to the science of positive traits, subjective experiences and institutions. It focuses on the empirical study of the factors that enable humans to flourish, develop resilience, mature and master life's challenges. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3724 - Developmental Psychobiology

Explores the biological influences on the development of brain and behavior. Emphasis is on the evolution and development, the role of experience in prenatal and postnatal development, the ontogeny of sensory systems, learning and memory, and the biological bases of language acquisition. Prereq: PSYC 1000/1005 or BIOL 2051/2061. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3810 - Neuropsychology

Brain organization and function and its relationship to human memory, language, perception, and other cognitive abilities. Covers the application of clinical neuropsychology to working with individuals that have neurological disorders. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3822 - Aging, Brain and Behavior

Examines the aging process, behavioral changes during senescence and the accompanying changes in the aged brain. Changes that are part of healthy aging are studied, as will age-related brain disorders. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3832 - Neural Basis of Learning

Survey of advances in neuroscience that further the understanding of how neurons within our brains are modified by experience and thus influence subsequent behavior. Includes discussions of how these mechanisms contribute to various psychopathologies. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing, completion of minimum of 12 hours in psychology with minimum grade of 'C.' Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSYC 4054 - Behavioral Neuroscience

The morphological, neurochemical and physiological bases of behavior. Emphasis is on structure and function of the brain. Prereq: PSYC 1000, 1005, 2090, 2220, 3090 and 6 upper-division elective credits in psychology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4090 - Research Design and Development

This advanced writing and research methods course is designed to help students develop independent research ideas in Psychology into formal proposals and products, such as a thesis proposal, grant application, presentation and study protocol. Prereq: PSYC 3090 and instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4101 - Applied Statistics Using SAS and SPSS I

Teaches the practical statistical tools social scientists use to analyze real-world problems. It is split into four modules, each taught by a different instructor. The first module introduces SAS and SPSS; modules 2-4 are problem-based and cover topics such as ANOVA, multivariate regression, and cluster analysis. Prereq: Any statistics course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4102 - Applied Statistics Using SAS and SPSS II

Students use the skills they learned in the previous semester to analyze a social issue of their choosing and present their findings. Note: A continuation of PSYC 4101. In addition to lectures, weekly one-on-one meetings between faculty and students are required. Prereq: PSYC 4101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4164 - Psychology of Perception

Studies sensory processes and perceptual variables. Covers processes related to vision, audition, gustation and olfaction. Prereq: PSYC 1000 and 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4455 - Theories of Personality

An in-depth look at several major theories of personality, including those from psychodynamic, behavioral, and humanistic schools of thought. Students are required to think actively and abstractly, and communicate their ideas in papers and classroom contributions. Prereq: PSYC 1000 and 1005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4485 - Psychology of Cultural Diversity

Studies diversity in the development of the individual across Asian, Black, Hispanic, and Native American cultures. The experience of self, role of the family, expression of emotions, and psychology of prejudice are emphasized. Prereq: Six semester hours of psychology, sociology, and/or anthropology in any combination. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4500 - Psychotherapy

Overview of the major systems of psychotherapy, including psychoanalysis, person-centered therapy, family therapy, cognitive or behavioral approaches, and relationships among the various approaches. Prereq: PSYC 1000, 1005, 2090, 2220, 3090 and 6 upper-division elective credits in psychology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4511 - History of Psychology

Development of psychological theories since 500 B.C. Schools of psychology and their adherents. Readings of primary and secondary sources. Prereq: PSYC 1000, 1005, 2090, 2220, 3090 and 6 upper-division credits in psychology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4680 - Behavioral Sciences Research Seminar

Introduces research in the behavioral sciences. Students will learn about behavioral sciences research programs at CU Denver and other centers, present results of their own research, and interact with the community of local behavioral science research scholars and visiting scientists. Prereq: permission of the instructor. Max hours: 4 Credits. **Semester Hours:** 1 to 1

PSYC 4730 - Clinical Psychology: Ethics and Issues

An in-depth exploration of the values and ideas that guide professional practice in psychology, including professional codes of conduct and philosophical ethical principles. Topics include confidentiality, informed consent, competence, integrity and respect. Prereq: 1000, 1005, 2090, 2220 and 3090. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4780 - Behavioral Sciences Research: Ethics and Issues

Students will critically review and analyze some of the major ethical and policy issues that arise during the conduct of basic and applied behavioral research. Prereq: PSYC 1000, 1005, 2090, 2220 and 3090 or instructor permission. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4803 - Principles of Psychological Testing

Principles underlying construction, validation, and use of tests of ability, intelligence, and personality and of attitude surveys. Covers statistical topics such as content and construct validity, item analysis, and reliability analysis. Prereq: A prior course in statistics. Cross-listed with PSYC 5803. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 4840 - Independent Study: PSYC

Prereq: Permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

PSYC 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PSYC 4939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSYC 4990 - Topics in Psychology

Advanced study of special topics to be selected by the instructor. May be repeated for credit. Prereq: Permission of instructor. Cross-listed with PSYC 5990. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSYC 5803 - Principles of Psychological Testing

Principles underlying construction, validation, and use of tests of ability, intelligence, and personality and of attitude surveys. Covers statistical topics such as content and construct validity, item analysis, and reliability analysis. Prereq: Admission to psychology graduate program. Cross-listed with PSYC 4803. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 5840 - Independent Study: PSYC

Max hours: 12 Credits. **Semester Hours:** 1 to 3

PSYC 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

PSYC 5939 - Internship

Max hours: 12 Credits. **Semester Hours:** 1 to 6

PSYC 5990 - Topics in Psychology

Advanced study of special topics to be selected by the instructor. Note: May be repeated for credit. Prereq: Permission of instructor. Cross-listed with PSYC 4990. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSYC 6200 - Developmental Psychopathology

The study and prediction of maladaptive behaviors and processes across time. Students develop a sophisticated understanding of important concepts related to emotional and behavioral problems in children and adolescents, including DSM-IV-TR diagnostic criteria and the basic tenets of successful intervention. Prereq: Admission to the Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 6840 - Independent Study

A structured experience, planned and implemented with the assistance of a sponsoring faculty member in ongoing programs of research or other scholarly activity. Prereq: Admission to the graduate program in psychology. Max hours: 12 Credits. **Semester Hours:** 1 to 3

PSYC 6841 - Independent Study: PSYC

Max hours: 9 Credits. **Semester Hours:** 1 to 3

PSYC 6910 - Research Practicum

Max hours: 12 Credits. **Semester Hours:** 3 to 3

PSYC 6930 - Clinical Internship

Clinical experience in a setting which provides supervision by qualified professionals. Students participate in assessment, intervention, and/or evaluation and research. Prereq: Completion of 24 hours of course work in the UCD Psychology MA, Clinical program. Max hours: 12 Credits. **Semester Hours:** 1 to 6

PSYC 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

PSYC 7144 - Advanced Cognition and Emotion

Overview of contemporary psychological theories and research in human learning, memory, cognition, and emotion. Emphasis on cognitive and affective neuroscience and the physiological-psychological organization of functional systems. Prereq: Admission to the Clinical Health Psychology Ph.D. Program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7205 - Advanced Developmental Psychology

A survey of neurobiological, cognitive, social and cultural processes in human development from conception through adulthood. Prereq: Admission to the Psychology MA, Clinical program or Clinical Health Psychology Ph.D. program or with permission of instructor and a graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7220 - Advanced Biological Bases of Behavior

Survey course of advances in psychobiology which inform our understanding of the brain and behavior with special emphasis on perception, action, and cognition. A major goal of the course is to foster appreciation of the importance of interdisciplinary research. Prereq: Admission to the Clinical Health Psychology PhD program or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7262 - Health Psychology I

Part I of a 2-course sequence. Presents crucial aspects of health psychology and behavioral medicine, including theoretical models, anatomy and physiology epidemiology, health promotion and primary prevention of medical problems. Prereq: Admission to the Clinical Health Psychology Ph.D. Program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7350 - Psychotherapy I

Surveys some of the major schools of psychotherapy, including cognitive and cognitive-behavioral therapies as well as motivational interviewing. Coverage also includes therapy techniques, process of therapy, and treatment-outcome research. Prereq: Admission to the Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7360 - Psychotherapy II

Theoretical approaches and techniques used in research, assessment and treatment of major forms of psychopathology, including anxiety, depression, schizophrenia and substance abuse, as well as marital problems and childhood disorders. Prereq: Admission to the Clinical Health Psychology Ph.D. Program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7400 - Child Assessment

Psychometric theory and practice in assessment of children with focus on the diagnostics, the WISC-III, and personality assessment. Prereq: Admission to the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7410 - Assessment I: Personality

Reviews the process of selection, evaluation, administration, utilization, and interpretation of psychological tests related to psychosocial functioning. Issues of validity, reliability, utility, clinical judgement, ethics, and cross-cultural competence are reviewed. Prereq: Admission to the Clinical Health Psychology Ph.D. program, Clinical Psychology MA program, or by permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7420 - Assessment I: Intellectual and Cognitive Assessment

Reviews the process of selection, evaluation, administration, utilization, and interpretation of psychological tests related to cognitive functioning. Issues of validity, reliability, utility, clinical judgement, ethics, and cross-cultural competence are reviewed. Prereq: Admission to the Clinical Health Psychology Ph.D. program, Clinical Psychology MA program, or by permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7485 - Diversity in Clinical Psychology

Designed to foster understanding of diversity and its implications for clinical practice, research, and mental health policy. Students will learn to orient to the worldviews of clients from diverse backgrounds and to tailor their interventions to competently serve individuals in a pluralistic society. Restrictions: Restricted to Graduate majors in PSYC and PSYH. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7490 - Topics in Health Psychology Summer Lecture Series

Weekly lectures given by Clinical Health Psychology department faculty, advanced graduate students, alumni and area professionals on selected topics in the field. Note: This course is required for first, second and third-year graduate students. Prereq: Admission to the Clinical Health Psychology Ph.D. Program. Max hours: 6 Credits. **Semester Hours:** 1 to 3

PSYC 7500 - Advanced Psychopathology

Key features of major mental disorders in adult populations. Includes classification, DSM diagnosis, epidemiology, course and prognosis, age/culture/gender features, etiology and biological bases. Prereq: Admission to Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7511 - Historical and Philosophical Foundations of Psychology

Philosophical and historical antecedents to contemporary psychology, with particular emphasis on clinical psychology. Prereq: Admission to the Clinical Health Psychology Ph.D. Program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7520 - Experimental Psychopathology

Theories of etiology of major psychopathologies, including: personality disorders, anxiety disorders, affective disorders, substance use disorders and schizophrenia and other psychoses. Prereq: Admission to the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7700 - Clinical Research Methods

Principles of research methodology in clinical psychology. Major topics include research ethics, subject recruitment, ethnic and cultural considerations, selecting and evaluating research measures, epidemiology and comorbidity, taxonomic and outcome research and research design. Prereq: Admission to the Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7710 - Multivariate Statistics

Topics include multiple regression, logistic regression, factor analysis, and structural equation modeling. Both experimental and non-experimental designs will be considered. Students will learn underlying theory of these techniques as well as how to perform analyses using software like SPSS and Mplus. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7713 - Advanced Statistics

Experimental design and analysis of controlled interventions and evaluations. Emphasis on multifactor analysis of variance, orthogonal contrasts, post-hoc tests, multiple regression, and analysis of co-variance. Prereq: Admission to the Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7730 - Ethics and Professional Issues in Psychology

An in-depth exploration of the values and ethical ideas that guide professional practice in psychology, including philosophical ethical principles and professional codes of conduct. Specific topics include confidentiality, informed consent, competence, and respect for persons. Students are expected to be able to think about and communicate difficult ethical concepts in the form of class participation and a major paper. Prereq: Admission to the Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 7830 - Clinical Interviewing

Students practice interviewing and develop skills, including the ability to listen actively, to critique their own work and the work of others, and to think carefully about issues that arise in clinical work with clients. Prereq: Admission to the Psychology MA, Clinical program or the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 1 to 3

PSYC 7910 - Clinical Practicum

Clinical experience under supervision of licensed, doctoral-level professionals. Students participate in assessment, intervention, and/or evaluation and research in a variety of settings. Note: All field placements must be approved by the Director of Clinical Training (DCT) in advance of registration. Restrictions: Restricted to Graduate majors in PSYC and PSYH. Max hours: 12 Credits. **Semester Hours:** 1 to 6

PSYC 8100 - Clinical Behavioral Medicine

Presents basic assessment and psychotherapeutic techniques used for patients with various disorders, focusing on cognitive-behavioral methods and the unique needs of patients experiencing chronic disease. Prereq: Admission to the Clinical Health Psychology Ph.D. Program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8200 - Teaching Skills Workshop

Students will learn, explore, and practice the basic principles and strategies of good teaching. We will also explore research and theory for teaching at the college level. Prereq: Admission to the Clinical Health Psychology Ph.D. program or with permission of instructor(s). Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8262 - Health Psychology II

Part II of a 2-course sequence. Further aspects of health psychology and behavioral medicine, including health service utilization, patient-provider relationships, social support, terminal illness and issues related to chronic disease states. Prereq: Admission to the Clinical Health Psychology Ph.D. Program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8501 - Primary Care Psychology

Examines emerging trends in the role of professional psychology and psychologists serving as health care providers in primary care medical settings. Knowledge, skills and attitudes as they apply to competencies unique to primary care will be covered. Prereq: Admission to the Clinical Health Psychology Ph.D. program or with permission of instructor and graduate program director. Students must also have completed PSYC 7262, 8262, and 7730, or equivalent courses. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8502 - Cardiovascular Health Psychology

The course focuses on research and clinical practice regarding psychological factors related to cardiovascular functioning and disease. The physiology of the cardiovascular system will be presented and primary and secondary prevention as related to psychological functioning will be emphasized. Prereq: Admission to the Clinical Health Psychology PhD program or with permission of instructor and graduate program director. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8503 - Group Interventions in Health Psychology

The course will serve as an introduction to group psychotherapy and group process principles with a focus on the

design, implementation and delivery of evidence-based group interventions in the field of Clinical Health Psychology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8550 - Advanced Social Psychology

This is a graduate level seminar that broadly covers the social bases of behavior from a social psychological perspective. It includes discussion of topics such as group processes, attribution theory, discrimination, and perspectives on attitudes. Restrictions: Restricted to Graduate majors in PSYC and PSYH. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PSYC 8910 - Advanced Clinical Practicum

Advanced clinical experience under supervision of licensed, doctoral-level professionals. Students participate in assessment, intervention, and/or evaluation and research in a variety of health care settings to address the interface between physical and psychological functioning. Note: All field placements must be approved by the Director of Clinical Training (DCT) in advance of registration. Restrictions: Restricted to Graduate majors in PSYC and PSYH. Max hours: 12 Credits. **Semester Hours:** 1 to 6

PSYC 8938 - Pre-Doctoral Internship

Intensive full-time clinical experience with supervision by licensed, doctoral-level professionals. Interns participate in assessment, intervention, and/or evaluation and research in a variety of settings. Students apply through the Association of Psychology Postdoctoral and Internship Centers (APPIC) national matching process. Note: All field placements must be approved by the Director of Clinical Training (DCT) in advance of registration. Restrictions: Restricted to Graduate majors in PSYC and PSYH. Max hours: 12 Credits. **Semester Hours:** 1 to 3

PSYC 8990 - Doctoral Dissertation

Independent research on the doctoral dissertation in Clinical Health Psychology. Prereq: Admission to the Clinical Health Psychology Ph.D. Program. Max hours: 10 Credits. **Semester Hours:** 1 to 10

PUAD 1001 - Introduction to Leadership and Public Service

This course provides a broad introduction to public service and encourages exploration of personal values and interests related to leadership, community, and life choices. Multiple paths to advancing the public good are explored, including volunteerism, citizenship, and service in government and nonprofits. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 3003 - Introduction to Nonprofit Organizations

Explore the historical background, development, role, auspices, organization, and purposes of nonprofit agencies. Expand awareness of the scope and breadth of the nonprofit sector in the U.S., examine the inner workings of nonprofit organizations as the foundation for further study. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 3004 - Managing Nonprofit Organizations

Examine leadership and decision-making theory and practice in the nonprofit sector. Explore classic and contemporary theories on leadership, management, governance and organizational effectiveness of nonprofit organizations. Techniques for effective board meetings, committee work, development of board members, and policy development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 4009 - Human Service Organizations

Provides an overview of human services delivery in government and nonprofit organizations. Explore causes and conditions that give rise to the need for effective and equitable human service organizations. Learn essential skills including cultural competencies, boundaries, and collaboration. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5001 - Introduction to Public Administration and Public Service

Examines fundamental theories, structures, and processes of governance in the United States, including the evolving roles and responsibilities of public, nonprofit, and private sectors. Covers topics including public service values and ethics, cross-sector and intergovernmental partnerships, and comparative public administration. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5002 - Organizational Management and Behavior

Course covers elements which, when combined, create a resilient learning organization. Topics include organization theory and design, managing human capital, group development and performance, inter- and intra-group communication, information management, and ethical decision-making. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5003 - Research and Analytic Methods

Examines qualitative and quantitative research methods used to answer questions and inform decisions in public and nonprofit settings. Methods covered include reviewing scholarly literature; formulating research questions; selecting appropriate design, data collection and sampling strategies; and analyzing data. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5004 - Economics and Public Finance

Evaluates the role of government with respect to provision and financing of public goods. Explores 5 broad topics: 1) welfare & microeconomics 2) expenditure theory 3) resource mobilization (emphasis on taxation) 4) fiscal federalism 5) basic budgeting & analytical tools. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5005 - The Policy Process and Democracy

Introduces theoretical and applied studies of the policy process. Policy process includes how (I) issues are conceptualized and brought forward as problems needing action; (II) policies are designed and selected; and (III) enacted policies are implemented, monitored, evaluated, and revised. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5006 - Public Service Leadership

Provides understanding of the role played by leaders within and across public and nonprofit organizations, and in complex social environments. Examines theories of leadership, skills and processes employed by effective leaders, and ethical conduct of leaders in shaping societal values. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5007 - Qualitative Research Methods

Focuses on qualitative research methods that incorporate field work techniques such as observation, interviews, and content analysis. The main objective is to discover practicalities and limitations of ethnographic methods with a comparative methodology perspective. Students are required to conduct a research project. Cross-listed with PUAD 7007. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5008 - Evidence-Based Decision-Making

Course provides opportunities for students to use skills developed in Research and Analytic Methods (including developing research/evaluation questions, designing surveys/interview guides, and analyzing data) to inform decisions and/or develop recommendations in multiple policy, management, and program evaluation scenarios. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5010 - Rocky Mountain Program

This program encourages participants to examine their public sector roles, develop an understanding of their leadership styles, develop communication skills, and enhance their ability to think more systematically and strategically in their positions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5030 - Denver Community Leadership Forum

Designed to increase cross sector cooperation and enhance personal leadership skills and knowledge, program is administered annually February to November. Students gain skills in conflict management, participate in Outward Bound program in July, and learn leadership theories and concepts from a variety of presenters and trainers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5110 - Seminar in Nonprofit Management

This course provides an overview of the principles and concepts that are unique to nonprofit management. Topics include executive management, funding diversity, human resource management, marketing, volunteer management and ethics. Students are also given an introduction to the history and the importance of the nonprofit sector. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5115 - Effective Grant Writing for Nonprofit and Public Sector Managers

This course is designed to provide students with the knowledge and skills to perform one of the most critical functions

for any public or nonprofit sector agency today: gaining funds through proposals. Students learn how to locate and analyze funding opportunities through public and private funders and how to research, plan and write effective and competitive proposals. The course provides theoretical and practical knowledge about persuasive writing, the proposal submission and review process, building effective relationships with funders and how to proceed after post-funding decisions (positive or negative). Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5120 - Nonprofits and Public Policy

Examines the intersection of public policy and the nonprofit world and the ways in which each affects the other. The course examines current policy issues that relate to the nonprofit sector such as conversion of nonprofit to for-profit status, regulation of the nonprofit sector, issues of financial management, the role of nonprofits in devolution and privatization of government services, tax exemptions, "charitable choice," donor control, governance and the future of the future of the sector. The course examines the ways nonprofits have affected the policy process and public policies by exploring the factors that shape social movements, nonprofit advocacy, strategies of influence, and the role of nonprofits in social movements such as Civil Rights and the environment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5125 - Civil Society and Nongovernmental Organizations

This course is designed for students interested in the international nonprofit sector. The course compares non-Western forms of civil society with the American tradition of civil society. Students will learn about the efforts of Nongovernmental Organizations (NGOs) working in Third World countries to influence democracy, free association, and/or increased political and societal pluralism. Additionally, the course will focus on NGO management and governance issues in countries where there are strict controls and limits on the activities of NGOs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5130 - Collaboration Across Sectors

The blurring of the three economic sectors - government, business and nonprofits-- continues to increase as more partnerships are developed across sectors. This course focuses on collaboration and partnerships involving public, nonprofit and for-profit organizations. Additionally, students are expected to gain an understanding of the issues and policies associated with the bidding, contracting, program delivery and reporting processes when nonprofit organizations are contracted to achieve public sector goals and/or private sector objectives. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5140 - Nonprofit Financial Management

Financial management is one of the core competencies of effective nonprofit managers. Every nonprofit organization needs money to sustain or advance its mission. This course provides a grounding in financial management for the "non-accountant" by focusing on an array of knowledge and management skill areas necessary for allocating and controlling resources and for analyzing, reporting and protecting the fiscal health of the organization. Topics include key accounting principles, understanding and using financial statements, the budget development process, cash flow analysis, banking relationships, using the audit report, maximizing investment policy and strategy, and understanding the boundaries of tax exemption. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5150 - Fundraising & Financial Resource Development

Designed to provide a comprehensive overview of funding sources available to nonprofit organizations (e.g., foundation and governmental grants, individual and corporate donations, entrepreneurial sources of revenue and events.), as well as detailed information on how to secure support of the various sources presented. Additionally, students are expected to gain both theoretical and practical knowledge relevant to why it is important to diversify an organization's revenue streams. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5160 - Nonprofit Boards and Executive Leadership

The important roles and responsibilities of a voluntary board of directors and the process of governing are often misunderstood. This course explores the special powers of a nonprofit board of directors as framed by and responsive to public policy. From the perspective of organizational behavior and theory, the course examines the leadership role and interplay between board members and the executive director. The examination includes a comparative analysis of different governing models, and explores fundamental questions of board composition, the role of advisor boards, achieving effective board meetings, the realm of liability, using committees, and the board's role in fundraising, among other special subject matter. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5170 - Strategic Management for Nonprofit and Public Managers

Designed to train public and nonprofit managers in the effective use of strategic management tools and techniques traditionally used by corporations. Strategic management tools and skills, although traditionally used by business, should not be seen as the exclusive domain of corporations. The course teaches students how to adapt traditional strategic management capabilities to the particular conditions of public and nonprofit organizations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5180 - Social Entrepreneurship

Designed to introduce students to the concept of social entrepreneurship. Using nonprofit (and public) organizational examples, students gain an understanding of what it means to be an innovative manager. Students study techniques designed to advance an organization's mission and increase organizational effectiveness, accountability and efficiency through the use of for-profit techniques within a nonprofit context. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5220 - Human Resource Management

Covers human resource functions in public and nonprofit agencies. Topics include job analysis, compensation, recruiting, selection, rewarding, training and development. Contemporary issues concerning civil service reforms are also presented. Prereq: PUAD 5002 or PUAD 7002. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5250 - Intergovernmental Management

Surveys the basic literature of intergovernmental management and examines the interactive role of managers at federal, state, and local levels of government. Emphasis is placed on current intergovernmental issues. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5260 - Managing Diversity

Using a systems approach, diversity within organizations is examined through the construction and review of theories in private, public, and nonprofit organizations. Existing models of managing diversity are examined and analyzed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5271 - Managing Conflict and Change

Explores the process of change in organizations, communities, society, and conflicts that arise. Through the use of relevant case studies and role playing exercises, students are provided a practical framework for looking at change and managing conflict associated with change. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5280 - American Public Service Environment

Designed for SPA international students, especially those in their first or second semester, students will compare US culture and its public and nonprofit organizations (NGOs) with those in their home countries. Class sessions include: site visits; guest speakers from public and non-profit organizations; case studies, with an emphasis on applying theory to current issues in public policy and management. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5310 - Policy Formulation & Implementation

Building on PUAD 5005, students learn how policy is developed and implemented in several levels of government - local, state, federal - and within organizations themselves. The course makes use of the case studies to explore the intricacies of developing and implementing policy and the political, economic, and institutional contexts that affect these two states of policy development. Students also consider the different criteria that can be used to judge the effectiveness of programs and policies. Prereq: PUAD 5005 or 7005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5320 - Public Policy Analysis

Provides training in the systematic analysis of policy and program initiatives using an economics orientation and employing a case method. The course covers benefit-cost analysis, cost-effectiveness analysis, present values, and the treatment of multiple criteria in public sector program analysis. Prereq: PUAD 5003/7003, 5004/7004 and 5005/7005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5330 - Intermediate Statistical Analysis

Follows PUAD 5003/7003 and is focused on more advanced statistical techniques to be used in research. These techniques include the use of regression in time series analysis; binary response; nonlinear, logistic, and profit models; and factor and path analysis. Evaluating potential problems with model specification and the remedies are included. Students are required to test hypotheses using these models with a data set. Prereq: PUAD 5003 or 7003. Cross-listed with PUAD 7330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5350 - Program Evaluation

Describes the theory and methodology for the design of social research and demonstration projects and the application of analytic and statistical methods for evaluating public programs. Focus is on the application of evaluation methods

and techniques of data interpretation. Report preparation is emphasized. Prereq: PUAD 5003 or PUAD 7003 and PUAD 5005 or PUAD 7005. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5361 - Capstone Seminar

Synthesizes competencies gained throughout the course of study into a client-based research project. Students conduct independent research, complete a final written project demonstrating their qualifications and expertise, and orally present findings to a committee of faculty and public administration professionals. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5370 - Media and Public Policy

Explores the conventions and practices of the print and electronic media in the United States. The course enables students to better understand the place of the media in society, the way the media look at themselves and how journalists confront conflicting values in the performance of their roles. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5380 - Citizen Participation: Theory and Practice

Tackles the issues of citizen participation and community involvement in theory and practice. Students work in class on understanding the theoretical foundations that are relevant to citizen participation. Students engage in significant out-of-class projects to ground them in the practice of public involvement. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5410 - Administrative Law

Examines legal aspects of policy implementation particularly the relationship between courts and administrative agencies. Covers standards of judicial review and agency action; administrative procedure and due process; selected special topics such as rights, liabilities, and immunities of public employees; and administrative discretion and scientific uncertainty. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5420 - Law and Public Policy

Examines the relationship between courts and legislative assemblies. Explores how legislators use the policy process to shape and influence the exercise of judicial authority, and how the courts affect the policy process in reviewing the constitutionality of state and federal legislation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5440 - Negotiation and Conflict Resolution

Focuses on concepts and skills necessary to negotiate policy and management decisions and manage internal and external conflicts. Designed to help students understand the dynamics that affect negotiations and to apply the principles and strategies of negotiation in a variety of decision making and dispute resolution contexts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5450 - Law of All-Hazards Management

This course conveys knowledge of the statutes, regulations and court decisions governing the management of hazards by governmental agencies. It covers local, state and federal agencies as they mitigate, prepare for, respond to and recover from naturally, accidentally and intentionally caused disasters. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5460 - Political Advocacy

Addresses advocacy & lobbying issues of public policy & govt problems. Special attention is given to how advocacy process works in the public sector & policy making bodies & how lobbying techniques & processes can be understood. General focus on practical applications at all levels of govt with primary attention to state & local govt. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5501 - Contemporary Issues in Revenue and Tax Administration and Policy

This course provides a contemporary evaluation of Colorado's tax structure, revenue system, and the state budget. The interaction of politics, the initiative process, the State Constitution, and stakeholders is studied. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5502 - Public Financial Management and Policy

Provides basic understanding of issues & tools relevant to financial mgmt of public & non-profit org, including managerial acct (managing resources & obligations, investing idle funds, reporting, financial statement analysis, overview of budgeting, revenue forecasting, & costing) & debt management. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5503 - Public Budgeting and Finance

Covers concepts to manage the fiscal purse, prioritize resources, use financial documentation, and analyze fiscal data. Includes budget policy, content, format, processes, performance management, forecasting, inflation adjustment, time value of money, cost analysis, financial condition analysis, and spreadsheet competency. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5540 - Organization Development

Studies the dynamics involved in managing and facilitating change in organizations by application of behavioral science knowledge. Emphasis is placed on both cognitive and experiential learning. A background in organization theory and administrative behavior is required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5615 - Health Policy

Draws upon existing policy models and evaluates the status of health policy formulation and implementation. Health policy topics include Medicaid and Medicare, managed care, health care reform proposals, telemedicine, the non-profit and for-profit role in health. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5625 - Local Government Management

Relates the systems, processes, and principles of public management to the local government environment. Public management concepts such as strategic planning, bureaucracy, formal and informal organizational structures, human resource planning, management control, systems theory, and administrative behavior are explored within the context of local government. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5626 - Local Government Politics and Policy

Examines local government from the perspective of politics and public policy making. The course focuses on local government political structures, policy analysis and formulation, political forces in administrative decision making, and the relationships between professional administrators and elected officials. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5628 - Urban Social Problems

Examines local government from the perspective of sociology and group dynamics. Course could include some or all of the following subjects: neighborhoods and community groups, class and race relations, community crime, social service issues, immigration, the underclass in American society, and related urban social problems. Cross-listed with URPL 6449. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5631 - Seminar in Environmental Politics and Policy

Examines the fundamental principles of politics and policy that shape strategies of environmental protection. Focuses on the role of institutional processes, government organizations and nongovernmental organizations in environmental politics and policy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5632 - Seminar in Environmental Management

Examines the practical challenges facing environmental managers today, using a series of case studies. Focuses on the role of institutional processes, government organizations and nongovernmental organizations in the practice of environmental management. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5633 - Seminar in Natural Resource and Environmental Health Law

Studies administrative law aspects of environmental policy implementation & enforcement, role of courts in stimulating & limiting statutory reform, & regulatory innovation. Focuses on legal aspects of natural resource allocation & mgmt, & environmental protection. Alternatives to traditional processes for environmental dispute resolution. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5650 - Public Policies for Homeland Security and Disasters

Examines public policymaking and administration related to homeland security and disasters in the United States,

including the interplay between security and traditional hazards management concerns. Assesses the role of institutional processes, governmental and nongovernmental organizations in policy development and implementation. Cross-listed with PUAD 7650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5655 - Principles of Emergency Management

This course is an introduction to the practice of emergency management. It provides instruction on the discipline of emergency management and covers not only administrative practice, but how public policy shapes how governments at all levels address hazards, emergencies and disasters. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5710 - Public Sector Technology

This course addresses the impact and current use of technology in the modern government and nonprofit sector environments, including implications for interacting with citizens and organizational stakeholders, organizational decision-making and communication, and core functions such as budgeting and human resources. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5910 - Nature and Scope of Interpersonal Violence

This course will analyze the social, historical, political, legal, and psychological aspects of gender based violence. Topics addressed include: definitions of the problem, demographics, children and youth exposed, national and global perspectives. Strategies for prevention, intervention, treatment, and social change are explored. Cross-listed with CRJU 5910 and 7910. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5920 - The Psychology of Interpersonal Violence

This class addresses the contributions and limitations of current empirical and clinical psychological literatures about interpersonal violence (IPV). The primary focus of the course is on the effects of IPV on adult and child survivors, on their psychological needs, and on the contribution of psychological knowledge to practice in IPV. Cross-listed with CRJU 5920 and 7920. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5930 - Interpersonal Violence Law and Policy

This course provides insight into public policy and law affected by or affecting interpersonal violence, (welfare reform, child maltreatment, criminal and civil court responses). Students will understand the role of law enforcement agents and the practice of victim advocacy, and describe and engage in methods to change law and policy. Cross-listed with CRJU 5930 and 7930. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5940 - Interpersonal Violence Leadership, Advocacy, and Social Change

Students will gain an understanding of different models of social change and the various approaches to public address, including social movements and campaigns, that accomplish change. Strategies for engaging diverse individuals, systems and communities to address interpersonal violence will be examined at individual to societal levels. Cross-listed with CRJU 5940 and 7940. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5960 - Interpersonal Violence and Health Care

Provides students with the knowledge and skills necessary for responding to the health care needs of patients experiencing interpersonal violence (IPV). Also explores how healthcare professionals can develop public & institutional discourses that transform healthcare policies & systems to address the health needs of IPV survivors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 5961 - Interpersonal Violence, Health Advocacy and Systems Change

Explores how healthcare professionals can develop successful public & institutional discourses that transform healthcare policies & systems to address the health needs of patients experiencing interpersonal violence. Methods of advocacy, activism & organizational change that produce positive results including effective educ techniques. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 6600 - Special Topics: Public Administration

Studies special topics relevant to public administration, such as public/private sector partnerships, community participation, international development, conflict management, regionalism, managing economic options for Colorado, and nonprofit management and marketing. Each semester various topics are studied. Max hours: 15 Credits. **Semester Hours:** 1 to 4

PUAD 6840 - Independent Study: PUAD

Affords students the opportunity to do independent, creative work. Prereq: Permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 6

PUAD 6910 - Internship

For students who have not had government experience. Studies and reports are made while students have full- or part-time administrative traineeships, internships, or similar positions in government agencies or government-related organizations. Prereq: Completion of the common core courses. It is recommended that at least three of the track courses also be completed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 3 to 6

PUAD 7007 - Qualitative Research Methods

Focuses on qualitative research methods that incorporate field work techniques such as observation, interviews, and content analysis. The main objective is to discover practicalities and limitations of ethnographic methods with a comparative methodology perspective. Students are required to conduct a search project. Cross-listed with PUAD 5007. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 8010 - Historical and Comparative Foundations of Public Administration

A doctoral seminar on developments and changes in public administration as a field of study. It examines how theory and practice have evolved and how the field is defined, studied and taught. It must normally be taken during the first full semester of the doctoral program. Prereq: PUAD 7001 or PUAD 5001 (or equivalent). Max hours: 3 Credits.

Semester Hours: 3 to 3

PUAD 8020 - Seminar in Public Management

An in-depth examination of contemporary literature, concepts, and theories of public management. Current issues and research problems are emphasized to prepare students for their advanced research. Prereq: PUAD 7003/5003, 7004/5004 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 8030 - Seminar in Public Policy

Offers an in-depth examination of contemporary literature, concepts, and theories of public policy, with an emphasis on policy process. Current issues and research problems are emphasized to prepare students for their advanced research.

Prereq: PUAD 7004/5004, 7005/5005 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 8040 - Seminar In Economic and Institutional Foundations of Public Affairs

Offers an in-depth examination of the economic and institutional foundations of public affairs, with an emphasis on the evolution of theory and research in these fields. Prereq: PUAD 8010 and 8030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 8060 - Seminar On The Conduct Of Empirical Inquiry

Introduces basic elements of research design in the social sciences, focusing on the relationship between theories and methods, concept development and measurement, selection of observations or cases, and alternative methods of data collection and analysis. Prereq: PUAD 5003,7003 or equivalent, PUAD 8010, 8020, 8030, and 8040. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 8070 - Quantitative Methods II

Moves beyond basic linear regression techniques by covering advanced analytic methods for improved causal inference. Students will also be introduced to data management skills and techniques for using longitudinal data.

Prereq: PUAD 8010, 8020, 8030, 8040, 8050, and 8060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

PUAD 8840 - Independent Study: PUAD

(Doctoral level) Affords students the opportunity to do independent, creative work. Prereq: Permission of advisor. Max hours: 9 Credits. **Semester Hours:** 1 to 6

PUAD 8990 - Doctoral Dissertation

Once students are admitted to candidacy, they must be continuously registered for dissertation credit each fall and spring semester or be automatically dropped from the program. Students must register for 5 credit hours per semester. In cases where students will not be using any university resources during a particular semester, they may petition the Ph.D. director to register for fewer semester credit hours. Students must be registered for dissertation credit during the semester they have a colloquium or defense. Max hours: 30 Credits. **Semester Hours:** 1 to 10

RISK 1000 - RISK Intro to Risk Management and Insurance Careers

This course introduces students to the many and varied career opportunities in the risk management and insurance industry via visiting industry professionals and on site industry visits. The course meets 1 hour each week. Cross-listed with FNCE 1000. Max hours: 1 Credit. **Semester Hours:** 1 to 1

RISK 3809 - Introduction to Risk Management

This course introduces students to the fundamentals of risk and risk management for businesses and individuals. Corporate risk management techniques covered range from insurance to enterprise risk management. Personal risks discussed range from unemployment to retirement. Coreq: FNCE 3000. Insurance carrier operations are also considered. Cross-listed with FNCE 3809. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 3949 - Experiential Learning in RMI Industry

This course connects students to risk management service providers through the Risk Management and Insurance (RMI) Program. The students will intern with a specific provider. The RMI program and faculty will supervise and monitor tasks and assignments, and coordinate with the providers to maximize the learning experience. Cross-listed with FNCE 3949. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 4129 - Practical Enterprise Risk Management

Enterprise RM involves identifying the risks and opportunities faced by a firm, assessing them, developing and implementing a plan to address them, and then monitoring progress. Students will learn the basics of ERM while working with risk management professionals to develop and present such a plan to an ongoing business. Coreq: FNCE 3500. Cross-listed with RISK 6129 and FNCE 4129/6129. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 4409 - Employee Benefits and Workforce Risk Management

The course surveys an array of popular employee benefit programs to attract, protect, and retain valued employees. It also focusses on risk management programs that invest in human capital and address the downside risks of employing a workforce. Restriction: Junior or Senior standing. Cross-listed with RISK 6409 and MGMT 4460/6760. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 4509 - Global Risk Management

This course is designed to study how risk is transferred globally. The course will include travel to London, which is the home to many of the world's largest insurers and reinsurers. While in London, we will visit and have presentations from insurance brokers, companies, Lloyds of London, and reinsurers. Restriction: Junior or Senior standing. Cross-listed with RISK 6509 and FNCE 4509/6509. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 4809 - Property & Casualty Insurance

Students learn the fundamentals and uses of personal and commercial property and casualty insurance, including cost and pricing issues. Insurance company financial management and current trends in the insurance industry are also explored. Restriction: Junior/Senior Standing, or permission of the instructor. Cross-listed with FNCE 4809. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 4909 - Corporate Risk Management

This course provides an overview of the corporate risk management process. It considers the ways companies identify their risk exposures, the tools used to measure and mitigate those exposures including the latest developments in alternative risk transfer, and ultimately, how risk management adds value to the firm. Prereq: RISK 3809 Coreq: FNCE 3500. Cross-listed with FNCE 4909/6909 and RISK 6909. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 4950 - Special Topics: Cyber Risk Management & Cyber Warfare

This course will focus on the evolution of cybercrime, cyber warfare and cyber terrorism, how state and non-state actors utilize asymmetrical warfare to infiltrate government and corporate networks, to manage the risks associated with information technology and mitigate the effects of cybercrime and cyber warfare. Cross-listed with RISK 6800. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6129 - Practical Enterprise Risk Management

Enterprise RM involves identifying the risks and opportunities faced by a firm, assessing them, developing and implementing a plan to address them, and then monitoring progress. Students will learn the basics of ERM while working with risk management professionals to develop and present such a plan to an ongoing business. Cross-listed with RISK 4129 and FNCE 4129/6129. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6309 - Strategic Risk Management

This course introduces strategic risk management, the process of managing the uncertain and unknown risks to a firm's plans to add value to its owners and society. Prereq: RISK 6809. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6409 - Employee Benefits and Workforce Risk Management

The course surveys an array of popular employee benefit programs to attract, protect, and retain valued employees. It also focusses on risk management programs that invest in human capital and address the downside risks of employing a workforce. Cross-listed with RISK 4409 and MGMT 4460/6760. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6509 - Global Risk Management

This course is designed to study how risk is transferred globally. The course will include travel to London, which is the home to many of the world's largest insurers and reinsurers. While in London, we will visit and have presentations from insurance brokers, companies, Lloyds of London, and reinsurers. Cross-listed with RISK 4509 and FNCE 4509/6509. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6800 - Special Topics: Cyber Risk Management & Cyber Warfare

This course will focus on the evolution of cybercrime, cyber warfare and cyber terrorism, how state and non-state actors utilize asymmetrical warfare to infiltrate government and corporate networks, to manage the risks associated with information technology and mitigate the effects of cybercrime and cyber warfare. Cross-listed with RISK 4950. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6809 - Principles of Risk Management & Insurance

This course prepares students for advanced work in insurance and RM. The course first covers the nature of risk and risk fundamentals, insurer operations and insurance regulation. It then considers the principal techniques of managing risk exposures and the basis of decision making in management of business and personal risks. Coreq: BUSN 6640 or permission of instructor. Cross-listed with FNCE 6809. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 3 to 3

RISK 6909 - Corporate Risk Management

This course provides an overview of the corporate risk management process. It considers the ways companies identify their risk exposures, the tools used to measure and mitigate those exposures including the latest developments in alternative risk transfer, and ultimately, how risk management adds value to the firm. Prereq: RISK 6809. Cross-listed with RISK 4909 and FNCE 4909/6909. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RLST 1010 - Greek I: Biblical

Intended for students of languages, religious studies, and philosophy. Introduces the forms and syntax of Greek so that in the 13th week students will be able to read about 85% of the New Testament in the original language. Cross-listed with GREK 1010. Max hours: 5 Credits. **Semester Hours:** 5 to 5

RSEM 4001 - Special Topics

Specific topics vary from semester to semester. Cross listed with RSEM 5001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 5001 - Special Topics

Specific topics vary from semester to semester. Cross listed with RSEM 4001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 5050 - Classroom Assessment

Provides teachers with a conceptual framework for developing new assessments of student learning and attitudes, and for evaluating and selecting assessment instruments developed by others. Techniques of performance assessment and the use of portfolios in assessment are emphasized. A variety of assessment purposes--and their particular uses in placement, grading, instructional planning, and accountability--considered. Students design and administer portfolios and performance assessments; in addition, they read articles from leaders in the field. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 5080 - Research In Schools

Provides teachers with the competencies necessary for examining their professional experiences using formal and informal methods of inquiry. Teachers become more reflective practitioners who investigate questions that arise from their work in schools. The course also prepares teachers to critique published research in a thoughtful manner. The intended audience for the course is beginning and experienced P-12 teachers. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 5100 - Basic Statistics

A first-level course on the use and interpretation of descriptive and inferential statistics. Topics covered include: frequency distributions, measures of central tendency and measures of variability; shapes of distributions; standard scores; scattergrams, correlation and regression; and t-tests. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 5110 - Introduction to Measurement

A first-level course that examines the nature and purpose of psychological measurement. Particular attention is paid to the concepts of reliability, validity, norms, interpretation of scores, response sets, fairness in testing, and norm-referenced vs. criterion-referenced interpretation of scores. A variety of instruments that are used to measure human attributes and behaviors are studied. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 5120 - Introduction to Research Methods

Examines the purposes of research, the methods and designs of quantitative and qualitative research, and the processes involved in research studies. The methods of research examined include experimental designs, quasi-experimental designs, descriptive surveys, case studies, ethnographies and correlational designs. Designing a research study is a part of the course activities. Cross-listed with RSEM 4120. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 5600 - Issues in Assessment Development

This is the first course of a three-course series for a Classroom Assessment Certificate. The course focuses on developing the conceptual knowledge and technical skills required to help K-12 practitioners to develop valid, reliable, and fair assessment of student learning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 5610 - Formative and Summative Assessment in the Classroom

This is the second course of a three-course series for a Classroom Assessment Certificate. The course focuses on developing conceptual knowledge and technical skills required to develop and implement formative and summative assessments to support student learning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 5620 - Analyzing, Using, and Reporting Assessment Results

This is the second course of a three-course series for a Classroom Assessment Certificate. The course focuses on developing conceptual knowledge and technical skills required to develop and implement formative and summative assessments to support student learning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 5800 - Workshop: Topics in Research and Evaluation Methodology

Topics and credit hours vary from term to term. Often workshops address a current topic in research, evaluation, or measurement by considering its scholarly foundations and its application to schools and other educational settings. Max hours: 12 Credits. **Semester Hours:** 1 to 4

RSEM 5840 - Independent Study: RSEM

Max hours: 4 Credits. **Semester Hours:** 1 to 4

RSEM 5910 - Practicum in Research and Evaluation Methodology

Supervised work in projects that provide experience in data analysis, research, measurement, or evaluation. Requires a minimum of 75, 150, 225, or 300 clock hours under supervision (for 1, 2, 3, or 4 credit hours, respectively). Max hours: 8 Credits. **Semester Hours:** 1 to 4

RSEM 5920 - Readings in Educational Statistics

Max hours: 6 Credits. **Semester Hours:** 1 to 3

RSEM 5921 - Readings in Educational Research

Max hours: 6 Credits. **Semester Hours:** 1 to 3

RSEM 5923 - Readings in Educational Measurement

Max hours: 6 Credits. **Semester Hours:** 1 to 3

RSEM 5924 - Readings in Program Evaluation

Max hours: 6 Credits. **Semester Hours:** 1 to 3

RSEM 6100 - Methods of Qualitative Inquiry

Prepares graduate students to conduct field research employing qualitative methods and perspectives. Students become familiar with evolving theoretical and methodological perspectives in qualitative research drawn from anthropology, clinical psychology, sociology and education. Students apply techniques of qualitative data collections and analysis in a pilot investigation. Prereq: RSEM 5080 or RSEM 5200 or EDLI 7000 (or their equivalents as determined by the course instructor.) Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 6200 - Single Case Research Design for Education

This course provides an overview of Single Case research Design (SCRD) within educational settings. The course will describe single case designs (SCD), specify the types of questions that SCD's are designed to answer, discuss the internal and external validity of SCD's, outline SCD standards, and describe implementation of different SCRD's. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 7000 - Doctoral Seminar in Research Methods

Designed for students beginning doctoral work, explores conceptional and practical bases for doing and evaluating educational research. The chain of reasoning linking the conceptualization of a research problem, the posing of questions in a social process of inquiry, and the collection and interpretation of evidence is examined through the use of examples. Prereq: RSEM 5100 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 7010 - Educational Assessment And Measurement

This advanced course incorporates foundational knowledge and application of assessment and measurement tools in school settings. Foundational concepts are utilized to better understand student achievement and growth indicators, and inferences about school and educator effectiveness; survey measures are also addressed. Prereq: RSEM 5100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 7050 - Methods of Survey Research

Covers the purposes and methods of survey research. Topics included are: goals and uses of survey research, data collection methods, questionnaire and interview protocol design, reliability and validity of data collection methods, sampling, ways to reduce error in data collection and sampling, data analysis techniques commonly used in survey research studies, interpreting and reporting results, and ethical issues. Students design and conduct a survey as part of the course requirements. Prereq: RSEM 5100, 5200 or EDLI 7000 (or their equivalents, as determined by the course instructor). Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 7100 - Advanced Methods of Qualitative Inquiry

An advanced seminar directed at individuals who have completed an introductory course in methods of qualitative research. Topics included are qualitative data collection, data analysis, and writing about data. Students collect and analyze data. Prereq: RSEM 6100 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 7110 - Intermediate Statistics

Continuation of RSEM 5100, covering more advanced methods of analyzing data, with an emphasis on the use and interpretation of descriptive and inferential techniques. Topics covered are one-way and two-way analysis of variance; power; multiple comparisons; factorial designs and factorial ANOVA; partial correlation, multiple correlation and regression; analysis of covariance; and selected use of packaged statistical programs (SPSS). Prereq: RSEM 5100 or equivalent. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 7120 - Advanced Methods in Quantitative Inquiry and Measurement

Covers advanced topics in quantitative design and analysis, including advanced measurement topics. Topics include: specific types of design used in experimental, quasi-experimental, co-relational, and survey research; multivariate ANOVA, ANCOVA and MRC; factor and trend analyses; classical test theory; and IRT approaches. Students analyze their own data using techniques presented in the course. Prereq: RSEM 5080 or RSEM 5200 and RSEM 7110 or permission of instructor. Max hours: 6 Credits. **Semester Hours:** 3 to 3

RSEM 7150 - Mixed Methods Research

This seminar is directed at individuals who have completed both qualitative and quantitative research courses and are interested in combining these in the mixed-method approach. Focus will be on developing the skills and knowledge needed to formulate mixed-methodological research questions in which quantitative and qualitative data collection, analysis and interpretational techniques are utilized simultaneously or sequentially. Prereq: EDLI 7000, RSEM 7110 and 6100 or equivalents or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 7210 - Program Evaluation

This advanced course incorporates foundational knowledge and application of the topic of program evaluation as it applies to inquiry and decision making in schools and other educational settings. Max hours: 3 Credits. **Semester Hours:** 3 to 3

RSEM 7500 - Special Topics: Research and Evaluation Methods

Specific topics vary from semester to semester. Max hours: 12 Credits. **Semester Hours:** 1 to 6

RUSS 4999AE - RUSS Equivalent-Upper Div

- **Semester Hours:** 1 to 5

SCED 4004 - Elementary Science Teaching

This course explores issues in elementary school science learning and teaching. Teacher candidates will develop knowledge of the nature of science and science content, engage in scientific inquiry, work to identify student conceptions, and plan and enact science instruction. Cross-listed with SCED 5004. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SCED 4050 - Introduction to Science Teaching and Learning

Focus on conceptual development, conceptual change, collaborative learning, students' conceptions of various topics in science, practical issues encountered in facilitating learning, managing the classroom, formative and summative assessment, and differentiating instruction in a collaborative environment. Seminar for Learning Assistants. Student must be serving as a Learning Assistant in the CU Denver LA program. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SCED 4400 - Theory and Pedagogy of Science Learning

Examines current issues, strategies, materials, and technology related to the teaching and learning of science at the middle and secondary school levels. Science curriculum, teachers' pedagogical content knowledge, and research in science education are investigated. Cross-listed with SCED 5400. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SCED 4401 - Inquiry Science Pedagogy and Practices

An in-depth study of inquiry science pedagogy and practices and how inquiry science supports standards-based education to make science accessible to ALL learners. The course provides a review of research on pedagogy and practices that support student understanding, problem solving and creativity through the use of inquiry science. Prereq: Concurrent enrollment in an internship or permission of instructor is required. Cross-listed with SCED 5401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5004 - Elementary Science Teaching

This course explores issues in elementary school science learning and teaching. Teacher candidates will develop knowledge of the nature of science and science content, engage in scientific inquiry, work to identify student conceptions, and plan and enact science instruction. Cross-listed with SCED 4004. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SCED 5050 - Introduction to Science Teaching and Learning

Focus on conceptual development, conceptual change, collaborative learning, students' conceptions of various topics in science, practical issues encountered in facilitating learning, managing the classroom, formative and summative assessment, and differentiating instruction in a collaborative environment. Seminar for Learning Assistants. Student must be serving as a Learning Assistant in the CU Denver LA program. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SCED 5340 - Equity & Culture in Science Education: Local/Global

This course examines literature in science education related to issues of culture and equity. Topics will be framed by an understanding of equity in diverse classrooms and how it informs research, curriculum and instruction. Cross-listed with ENVS 5340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5350 - Issues and Trends in Science Education

Explores the current issues and trends in science education related to theory, pedagogy, practices, curriculum, and other contemporary topics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5360 - Physics Teaching and Learning

In this course, we will explore how people learn physics, and how physics is and can be taught. We will read literature in physics, physics education research, education, psychology, and cognitive science and apply it to your physics teaching. Prereq: 2 of the following PHYS 5101, 5102, 5103 or consent of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5365 - Physics Teaching as Research

In this course, you will research your teaching of physics, with the explicit goals of improving your teaching practice and improving student learning of physics. Prereq: 2 of the following PHYS 5101, 5102, or 5103 or consent of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5400 - Theory and Pedagogy of Science Learning

Examines current issues, strategies, materials, and technology related to the teaching and learning of science at the middle and secondary school levels. Science curriculum, teachers' pedagogical content knowledge, and research in science education are investigated. Cross-listed with SCED 4400. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SCED 5401 - Inquiry Science Pedagogy and Practices

An in-depth study of inquiry science pedagogy and practices and how inquiry science supports standards-based education to make science accessible to ALL learners. The course provides a review of research on pedagogy and practices that support student understanding, problem solving and creativity through the use of inquiry science. Prereq: Concurrent enrollment in an internship or permission of instructor is required. Cross-listed with SCED 4401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5416 - Math-Science Connections: Outdoor

(Primarily for pre-secondary teachers.) Explores science concepts through outdoor activities appropriate for middle-grade students. Topics include how the nature of science and mathematics informs pedagogy, national and state standards, earth science and paleontology, orienteering and map usage, water analysis, astronomy and entomology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5500 - The Nature of Science

This course is a critical exploration of science and scientific knowledge using an epistemological approach to ask (and possibly answer) questions about sociological issues in science and implications for science research, teaching and learning. Cross-listed with SCED 7500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5540 - Foundations of School Health Education

This course is an overview of the principles of behavior theory as they relate to health education in both theory and practice. The course will examine the characteristics of effective school-based health education programs. Issues of ethnicity, culture, and race as they relate to health will be examined throughout the course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5550 - Curriculum Materials in Health Education

This course will support the application of behavior theory as it applies to specific health content knowledge and skills. Special attention will be given to the skills, instructional strategies, and techniques needed to develop a culturally responsive classroom to promote success for all learners. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5560 - Health Education Teaching Practices

The course provides an overview of health education teaching and learning strategies for use in school settings. Action research will be introduced and utilized as a method to examine current teaching practices. Role-play, student assessment development, differentiation of instruction, and culturally responsive classroom practices will be examined. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5650 - Environmental Education

Theory and practice of conservation education, which include use of resource personnel and the study of curricular and instructional development. Field experiences are incorporated. Primarily oriented to elementary and junior high school. Cross-listed with ENV5 5650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5660 - Energy Education

Explores current energy problems. Students examine such topics as fuels from plants, fuels from wastes, fossil fuels, nuclear energy, wind energy, geothermal energy, solar energy, and energy conservation. Includes demonstration of available educational resources for grades K-12. The purpose of the course is to make technical aspects of energy accessible to the lay person. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5670 - Experiential Learning In The Parks

This course guides students through their experiences in a summer field placement, using readings, discussions and other interactive tools that focus on place-based education. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5690 - Curriculum Development in Place-Based Education

Students in this course apply knowledge about place-based education in schools and communities for educational purposes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5780 - Storytelling

Explores the history, function, philosophy, and techniques of storytelling. This class also includes collecting, selecting, preparing, developing, and delivering stories. Research and resources are emphasized. Max hours: 4 Credits. **Semester Hours:** 1 to 4

SCED 5800 - Curriculum Workshop for Science Teachers

Opportunity to work on curricular projects and problems in the schools. Explore various formal and informal learning environments such as study groups and after-school activities. Prereq: 18 semester hours in education and teaching experience or permission of instructor. Max hours: 36 Credits. **Semester Hours:** 0 to 4

SCED 5840 - Independent Study

Max hours: 9 Credits. **Semester Hours:** 1 to 4

SCED 5920 - Readings in Elementary Education

Max hours: 4 Credits. **Semester Hours:** 1 to 4

SCED 5930 - Internship in Secondary Education

Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 5950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

SCED 6110 - Science and Math Curriculum Studies

Students examine frameworks for curriculum design, discuss the psychological and philosophical foundations of curricula, and analyze the curriculum that they use in their own teaching. Students synthesize what teachers must do in order to effectively implement curricula. Prereq: Graduate student status. Cross-listed with SCED 7110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 6120 - International Perspectives on the Curriculum

Considers schooling patterns in the U.S., the U.K., Japan, Australia, and several European countries, examining different approaches to curriculum issues in relation to social, historical, and economic factors. Prereq: FNDS 5500 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 6840 - Independent Study

Max hours: 4 Credits. **Semester Hours:** 1 to 4

SCED 6950 - Master's Thesis

Max hours: 4 Credits. **Semester Hours:** 4 to 4

SCED 6950 - Master's Thesis

Max hours: 4 Credits. **Semester Hours:** 4 to 4

SCED 7110 - Science Math Curriculum Study

Students examine frameworks for curriculum design, discuss the psychological and philosophical foundations of curricula, and analyze the curriculum that they use in their own teaching. Students synthesize what teachers must do in order to effectively implement curricula. Restriction: Graduate student status. Cross-listed with SCED 6110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 7500 - The Nature of Science

This course is a critical exploration of science and scientific knowledge using an epistemological approach to ask (and possibly answer) questions about sociological issues in science and implications for science research, teaching and learning. Cross-listed with SCED 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCED 7840 - Independent Study

Max hours: 3 Credits. **Semester Hours:** 1 to 3

SCHL 4030 - Information Literacy

Teaching, assessment, and integration of information literacy skills. Reference collection development, policies and procedures, and use of and reference tools, including electronic resources. Emphasis is placed on standards-based collaborative planning and instruction with classroom teachers. Cross-listed with SCHL 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 4100 - School Libraries in the Digital Age

An introduction to the School Library profession, including its history, standards, organizations, and current trends. Course focuses on foundational principles and roles of school librarianship, as well as methods for developing a culturally responsive resource collection, both print and electronic. Cross-listed with SCHL 5100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 4160 - Managing School Libraries

Case studies in the organization and administration of school library and instructional leadership of programs and projects. Topics include project management, personnel administration, budget development, management strategies, copyright and intellectual freedom. Cross-listed with SCHL5160. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 4200 - Promoting Literature in Schools

Approaches the school library as a resource to promote literacy and development in children and young adults. Topics include genres of literature, methods for advising students towards appropriate reading and media resources, and the promotion of multiple literacies - information, new media, and transliteracy. Cross-listed with SCHL 5200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 5030 - Information Literacy

Teaching, assessment, and integration of information literacy skills. Reference collection development, policies and procedures, and use of and reference tools, including electronic resources. Emphasis is placed on standards-based collaborative planning and instruction with classroom teachers. Prereq: SCHL 5530, 5110 and 5020. Cross-listed with SCHL 4030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 5040 - Information Storage and Utilization

Provides basic principles and practices of utilizing standard methods for organizing, accessing and storing information. Includes cataloging and classification in text-based and electronic systems. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SCHL 5100 - School Libraries in the Digital Age

An introduction to the School Library profession, including its history, standards, organizations, and current trends. Course focuses on foundational principles and roles of school librarianship, as well as methods for developing a culturally responsive resource collection, both print and electronic. Cross-listed with SCHL 4100. Max hours: 4 Credits. **Semester Hours:** 4 to 4

SCHL 5160 - Managing School Libraries

Case studies in the organization and administration of school library and instructional leadership of programs and projects. Topics include project management, personnel administration, budget development, management strategies, copyright and intellectual freedom. Prereq: SCHL 5530, SCHL 5110, SCHL 5120, SCHL 5130 & SCHL 5140. Cross-listed with SCHL 4160. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 5200 - Promoting Literature in Schools

Approaches the school library as a resource to promote literacy and development in children and young adults. Topics include genres of literature, methods for advising students towards appropriate reading and media resources, and the promotion of multiple literacies - information, new media, and transliteracy. Cross-listed with SCHL 4200. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SCHL 5830 - School Library Workshop

Specific content and titles vary depending upon the particular school library skills addressed in the course. Max hours: 9 Credits. **Semester Hours:** 0 to 4

SCHL 5913 - School Library Field Experience

Field experiences in selected K-12 school libraries that meet a high professional standard. The course serves as a capstone experience for endorsement and master's degree plans and helps induct students into the School Library profession by bridging theory and practice. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 1001 - Introduction to Sociology

A survey course in which the main concepts that define the sociological perspective are presented, and a picture of society is provided by examining major social institutions and forms of social organization within society. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3 **Semester Hours:** 3 to 3

SOCY 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

SOCY 2001 - Inequalities in Social World

Introduces students to critical sociological perspectives on social inequality. Major sociological factors contributing to the production and reproduction of inequality in various social organizations and institutions are analyzed. Prereq: SOCY 1001 or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 2440 - Deviant Behavior

This course examines different forms of deviance and how deviant categories are created. Emphasis is on how groups gain control over social definitions and the consequences these definitions have in the form of norms, laws, and informal social sanctions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 2462 - Introduction to Social Psychology

Studies the development and functioning of persons, especially within a group context, and the dynamics of small groups. Emphasis is on import of symbols for human behavior, development of self-concepts, and the processes of competition and cooperation in group dynamics. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS3 **Semester Hours:** 3 to 3

SOCY 3001 - Urban Sociology

The city and urban society are examined in terms of social structure, residential and institutional patterning, process of interaction, demographic processes, and patterns of growth and change. Prereq: SOCY 1001 and sophomore standing or higher or permission of instructor. Cross-listed with ETST 3001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3010 - Sociology of Human Sexuality

Increases the understanding of differences in views of sexuality, specifically the link between sex and reproduction and its role as the motivation for gender roles and sex acts. Explores the history of sexuality, cross-cultural studies and primate modeling. Prereq: sophomore standing or higher or permission of instructor. Cross-listed with WGST 3010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3020 - Race and Ethnicity in the U.S.

A sociological examination of race and ethnicity in contemporary U.S. society. Includes a focus on the nature and causes of prejudice and discrimination. Dominant-minority relations are examined, with an emphasis on current status of minority groups and issues. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3040 - Drugs, Alcohol & Society

Explores our culture's relationship with drugs and alcohol from a sociological perspective, investigating all spheres of substance use: recreational, medicinal, instrumental & religious. Examines our long turbulent history with these chemicals, and the ways in which they have shaped our society. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3050 - Sociology of Education

Topics covered include school socialization, parent and peer effects on educational outcomes, special education, effects of standardized testing, race, ethnicity, gender, poverty in schools, public policies and funding, teacher burnout, students aspirations, post-secondary education, college readiness and local education issues. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3080 - Sex and Gender

Causes and consequences of sex role differentiation at the individual, group and societal levels. Current issues related to changing norms and values concerning gender in modern society are examined. Prereq: sophomore standing or higher or permission of instructor. Cross-listed with WGST 3080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3111 - Research Methods

Design of social research. Application of statistical techniques and procedures to social phenomena. Prereq: SOCY 1001 and sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3115 - Quantitative Methods & Analysis

This course provides students with a basic understanding of survey methods and statistical analysis. In addition to learning the basics of inferential statistics and sampling methods, students will conduct their own survey research, analyze data, and produce reports. Max hours: 4 Credits. **Semester Hours:** 4 to 4

SOCY 3119 - Qualitative Methods

This course focuses on the development of skills involved in designing qualitative research studies, collecting and analyzing qualitative data and evaluating qualitative research. Primary focus is on ethnography, in-depth interviewing, and content analysis. Students read, analyze, and conduct qualitative research. Max hours: 4 Credits. **Semester Hours:** 4 to 4

SOCY 3121 - Statistics

Quantitative techniques used in analyzing social phenomena. Prereq: SOCY 1001 and sophomore standing or higher or permission of instructor. Max hours: 4 Credits. **Semester Hours:** 4 to 4

SOCY 3140 - Sociological Theory

An overview of major sociological theories and concepts. The emergence of the discipline and the contemporary development of sociological theories are examined. Preq: SOCY 1001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3297 - Social History of Asian Americans

Introductory-level course surveys the social history of Asian American groups from the mid-19th century to the present. Examines immigration patterns, the development of communities, social and economic problems, and anti-Asian movements and activities. Prereq: sophomore standing or higher or permission of instructor. Cross-listed with ETST 3297 and HIST 3297. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3300 - Social Problems

Explores how societies define and attempt to solve "social problems." Topics covered: income disparities, race/ethnic relations, gender inequality, and sexuality, in addition to the relationship between these issues and social institutions such as education, religion, health care, and criminal justice. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3430 - Sociology for Pre-Health

An applied course covering socio-cultural influences on health, health disparities, and social aspects of medicine—the sociology areas included in the 2015 MCAT exam. Students will also get access to on-line study modules for the psychology content of the exam. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SOCY 3440 - Medical Sociology

This course covers key issues in population health and emphasizes how sociological perspectives both challenge and augment biomedical perspectives on health and health care. We also discuss the social causes and consequences of race/ethnic, sex, and socioeconomic disparities in health. Prereq: sophomore standing or higher or permission of instructor. Cross-listed with PBHL 3440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3490 - Criminology

Theories, nature and causes of crime as a social phenomenon. Processes of making laws, breaking laws, and reaction toward the breaking of laws. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3500 - Topics in Sociology

Special topics in sociology to be selected by the instructor. Note: Can be taken more than once when topics vary. Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 3510 - Topics in Sociology

Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 3520 - Topics in Sociology

Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 3530 - Topics in Sociology

Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 3540 - Topics in Sociology

Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 3550 - Topics in Sociology

Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 3650 - Sociology of Music

Focuses on the meaning/use of music in society. Explores censorship, organization of the recording industry, sociocultural contexts in which music is produced/distributed/listened to and the relationship between music and technology along with musical applications and associations. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3697 - Contemporary Asian American Experience

Examines the contemporary Asian American experience, including the adaptation of new immigrants or refugees, economic and educational problems, ethnic identity, intermarriage, anti-Asian discrimination and other civil rights issues, and recent political activism. Prereq: sophomore standing or higher or permission of instructor. Cross-listed with ETST 3697. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3700 - Sociology of the Family

The family as a social institution. Historical development and contemporary cross-cultural analysis, with emphasis on the contemporary American family. Prereq: sophomore standing or higher or permission of instructor. Cross-listed with WGST 3700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3720 - Global Perspectives on Social Issues

Various cultural and social frameworks are used in a sociological examination and international comparison of select social issues, such as globalization, terrorism, inequality and discrimination. Analysis of selected issues across cultures explores how societal and cultural characteristics shape these issues. Prereq: sophomore standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 3840 - Independent Study: SOCY

Prereq: sophomore standing or permission of the instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 3

SOCY 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: sophomore standing or higher or permission of instructor. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 4050 - Health Disparities

This course focuses on social, economic, and political factors that shape the uneven distribution of health and illness in

the United States. Social determinants of health are explored, including socioeconomic status, race and ethnicity, neighborhood environments, social relationships, and gender. Cross-listed with SOCY 5050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4110 - Sociology of Health Care

Examines the health care institutions of the United States. Issues such as the rising cost, the effect of class, racial and gender inequality, the professionalization and monopolization of roles, the current restructuring, construction of illness and health, managed care, health care for profit and ethics of health care decisions. Prereq: junior standing or higher or permission of instructor. Cross-listed with SOCY 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4220 - Population Change and Analysis

Concepts of population change, methods of analysis, and applications to contemporary social issues. Topics include age and sex distributions, fertility, mortality, and migration, and the social causes and consequences of these phenomena. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4270 - Social Meanings of Reproduction

Reproduction is not simply a biological process but holds symbolic, political, and ideological meanings. This course examines how people plan and experience reproduction, social definitions of who should/should not reproduce (and under what circumstances), and how policy and technology matter. Prereq: Junior standing or higher. Max hours 3 Credits. **Semester Hours:** 3 to 3

SOCY 4290 - Aging, Society and Social Policy

The role of the aged in today's society. Emphasizes interrelationships of the aged with the family, community, work, retirement and leisure. Prereq: Junior standing or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4340 - Juvenile Delinquency

Factors involved in delinquent behavior. Problems of adjustment for delinquents, and factors in treatment and post-treatment adjustment. Major theories covered include strain theory, social learning theory, control theory, and labeling theory. Course also reviews methods for testing these theories. Prereq: junior standing or higher or permission of the instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4440 - Social Inequality

Investigates the distribution of wealth, income, social class and economic power in the United States with a focus on social institutions and factors that shape inequality. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4460 - Hate Groups and Group Violence

Social sciences help us understand the phenomena of hate groups and group violence and contribute toward their elimination. Examples are examined using theoretical perspectives on different levels of analysis and within different areas of research. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5680. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4475 - Self and Identity

A course in social psychology focusing on individuals in social interaction. Focuses on self-conception, identify presentation of self, and self and emotion management. Major theories and research in social psychology literature are examined. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5475. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4610 - Sociology of Religion

This course introduces students to the nature and functions of religion in society, emphasizing western religions in the U.S. Students will develop and apply an understanding of classic and modern sociological theories of religion to current events and disciplinary developments. Cross-listed with SOCY 5610, RLST 4020, RLST 5020. Prereq: junior standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4640 - Sociology of Childhood and Adolescence

An in-depth overview of the theories and research regarding the life course understanding of infancy, childhood and adolescence. Children's lives and cultures in relation to adults and their transition from childhood to adolescence are studied. Prereq: junior standing or higher or permission of instructor. Cross-listed with SOCY 5640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4650 - Sociology of Adulthood and Aging

Examination of the adult life course—post-adolescence to death, focusing on key social transitions of adulthood (e.g., independence from parents, marriage, retirement), and historical, institutional, and social factors that create variation in their timing, meaning, and individuals' role experiences. Cross-listed with SOCY 5650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4690 - Crime and Inequality Over the Life Course

A life-course perspective on issues of inequality and crime. Studies transitions, trajectories and turning points as key features of the life course. Considers how life inequalities and criminal behavior are shaped by the timing of experiences, historical and geographic contexts, other people's lives, and human agency. Prereq: junior standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4700 - Sociology of Law

Consideration of the formulation, interpretation, and legitimacy of legal rules within the context of social organization. The examination of a major social institution in modern society. Prereq: junior standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4740 - Courts & Society

Courts are a centerpiece of modern legal systems that mediate social relationships and people's relationship to the state. This course explores the connection between courts and democratic society by considering the operation and evolution of courts in the U.S. Cross-listed with SOCY 5740. Restriction: Restricted to Junior standing or above. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4770 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Prereq: junior standing or higher or permission of instructor. Cross-listed with SOCY 5770. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 4771 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5771. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 4772 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5772. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 4773 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5773. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 4774 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 5774. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 4780 - Violence in Relationships

Course focuses on the study of violence among individuals involved in intimate relationships; factors in society such as norms, laws and institutions that are related to creating violence among intimates; and social policies, prevention, intervention and treatment programs. Prereq: junior standing or higher or permission of instructor. Cross-listed with SOCY 5780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4830 - Senior Capstone: Worklife Practices & Policies

Introduces students to tools and develops skills to facilitate internship and job search. Students gain understanding of work contexts, exploring employment laws and policies, dynamics of race and gender in job searching, and research on careers and job negotiation. Prereq: Must have earned a minimum of 75 credits. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 4840 - Independent Study: SOCY

Prereq: junior standing or higher or permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

SOCY 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Prereq: junior standing or higher. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SOCY 4910 - Research Practicum

Practical experiences for undergraduates in application of principles of research design and data processing to a social research problem selected by the instructor. Prereq: junior standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 1 to 3

SOCY 5000 - Professional Seminar: Sociological Inquiry

Introduces sociology graduate students to sociology as a discipline and profession. Conveys practical skills and knowledge useful to the pursuit of a graduate degree. Introduces students to sociology graduate faculty members and their research interests. Restriction: Students must be accepted to the MA in Sociology or get instructor permission in order to enroll in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5016 - Social Theory

An overview of major theories across the social behavioral sciences examining social order, integration, conflict, and change. The course emphasizes a cross-disciplinary approach highlighting works of historical and contemporary relevance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5024 - Seminar: Research Methods I

Problems and procedures in research design, data collection and processing. Note: Required for M.A. graduate students in sociology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5050 - Health Disparities

This course focuses on social, economic, and political factors that shape the uneven distribution of health and illness in the United States. Social determinants of health are explored, including socioeconomic status, race and ethnicity, neighborhood environments, social relationships, and gender. Cross-listed with SOCY 4050. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5110 - Sociology of Health Care

Examines the health care institutions of the United States. Issues such as the rising cost, the effect of class, racial and gender inequality, the professionalization and monopolization of roles, the current restructuring, construction of illness and health, managed care, health care for profit and ethics of health care decisions. Cross-listed with SOCY 4110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5183 - Seminar: Quantitative Data Analysis

A research-oriented seminar stressing the utilization of social data already collected in the test or generation of sociological theory. Note: Required for M.A. graduate students in sociology. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5193 - Seminar: Qualitative Data Analysis

This course is designed to help masters- level students develop skills for designing research studies, collecting and analyzing data and evaluating qualitative research. The course will concentrate on ethnography, in-depth interviewing, and content analysis. Students will read examples of qualitative research as well as articles about the process of doing qualitative research, but most importantly, students will conduct independent research. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5220 - Population Change and Analysis

Concepts of population change, methods of analysis, and applications to contemporary social issues. Topics include age and sex distributions, fertility, mortality, and migration, and the social causes and consequences of these phenomena. Cross-listed with SOCY 4220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5440 - Social Inequality

Investigates the distribution of wealth, income, social class and economic power in the United States with a focus on social institutions and factors that shape inequality. Prereq: Junior standing or permission of the instructor. Cross-listed with SOCY 4440. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5475 - Self and Identity

A course in social psychology focusing on individuals in social interaction. Focuses on self-conception, identity presentation of self, and self and emotion management. Major theories and research in social psychology literature are examined. Cross-listed with SOCY 4475. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5550 - Seminar: Sociology of the Family

An intensive review and analysis of the family as a social institution. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5610 - Sociology of Religion

This course introduces students to the nature and functions of religion in society, emphasizing western religions in the U.S. Students will develop and apply an understanding of classic and modern sociological theories of religion to current events and disciplinary developments. Cross-listed with SOCY 4610, RLST 4020, RLST 5020. Prereq: Graduate standing. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5640 - Sociology of Childhood and Adolescence

An in-depth overview of the theories and research regarding the life course understanding of infancy, childhood and adolescence. Children's lives and cultures in relation to adults and their transition from childhood to adolescence are studied. Cross-listed with SOCY 4640. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5650 - Sociology of Adulthood and Aging

Examination of the adult life course—post-adolescence to death, focusing on key social transitions of adulthood (e.g., independence from parents, marriage, retirement), and historical, institutional, and social factors that create variation in their timing, meaning, and individuals' role experiences. Cross-listed with SOCY 4650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5660 - Seminar: Social Psychology

Sociological approaches to the study of the self, role theory, persons in situations, identifications, socialization, and other characteristics of persons in society. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5680 - Hate Groups and Group Violence

Social sciences help us understand the phenomena of hate groups and group violence and contribute toward their elimination. Examples are examined using theoretical perspectives on different levels of analysis and within different areas of research. Cross-listed with SOCY 4460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5690 - Crime and Inequality Over the Life Course

A life-course perspective on issues of inequality and crime. Studies transitions, trajectories and turning points as key features of the life course. Considers how life inequalities and criminal behavior are shaped by the timing of experiences, historical and geographic contexts, other people's lives, and human agency. Prereq: junior standing or higher or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5740 - Courts & Society

Courts are a centerpiece of modern legal systems that mediate social relationships and people's relationship to the state. This course explores the connection between courts and democratic society by considering the operation and evolution of courts in the U.S. Cross-listed with SOCY 5740. Restriction: Restricted to Graduate level (degree seeking and non-degree seeking). Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5750 - Seminar: Criminology

An intensive review and analysis of the literature and research dealing with sociology of crime in modern society. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5770 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Cross-listed with SOCY 4770. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 5771 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Cross-listed with SOCY 4771. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SOCY 5772 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Cross-listed with SOCY 4772. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 5773 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Cross-listed with SOCY 4773. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 5774 - Advanced Topics in Sociology

Advanced study of special topics in sociology to be selected by the instructor. Note: May be repeated for credit when topics vary. Cross-listed with SOCY 4774. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SOCY 5780 - Violence in Relationships

Course focuses on the study of violence among individuals involved in intimate relationships; factors in society such as norms, laws and institutions that are related to creating violence among intimates; and social policies, prevention, intervention and treatment programs. Prereq: SOCY 1001, or a social science course. Cross-listed with SOCY 4780.

Max hours: 3 Credits. **Semester Hours:** 3 to 3

SOCY 5840 - Independent Study: SOCY

Max hours: 3 Credits. **Semester Hours:** 1 to 3

SOCY 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

SOCY 5955 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

SOCY 5964 - Master's Report

Max hours: 6 Credits. **Semester Hours:** 1 to 3

SPAN 1000 - Introduction to Cultures of the Spanish Speaking World

Introduces students to the Spanish-speaking cultures of Spain, Latin America, and the United States through a historical overview and a focus on contemporary politics and culture. Note: Taught in English. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1 **Semester Hours:** 3 to 3

SPAN 1010 - Beginning Spanish I

Introduces basic Spanish pronunciation and grammar, useful vocabulary and idioms. Readings and class discussions relating to the Hispanic world. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Max hours: 5 Credits. **Semester Hours:** 5 to 5

SPAN 1011 - Intensive Spanish

SPAN 1011/1021 combines both semesters of the first year, and meets the needs of highly motivated students of the language and culture. Note: Students who have studied Spanish previously should not enroll in SPAN 1011/1021

without first consulting a department advisor. Cross-listed with SPAN 1021. Max hours: 5 Credits. **Semester Hours:** 5 to 5

SPAN 1020 - Beginning Spanish II

(Continuation of SPAN 1010.) Further development of listening, speaking, reading and writing skills. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed SPAN 1010 or equivalent, or have taken one year of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 1010 is recommended for success in this course. This course is not intended for native speakers. Max hours: 5 Credits. **Semester Hours:** 5 to 5

SPAN 1021 - Intensive Spanish

SPAN 1011/1021 combines both semesters of the first year, and meets the needs of highly motivated students of the language and culture. Note: Students who have studied Spanish previously should not enroll in SPAN 1011/1021 without first consulting a department advisor. Cross-listed with SPAN 1011. Max hours: 5 Credits. **Semester Hours:** 5 to 5

SPAN 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

SPAN 1995 - Travel Study

For students doing travel study in a Spanish-speaking country; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

SPAN 2110 - Second Year Spanish I

Continues the development of skills acquired in 1010 and 1020. Readings deal with Hispanic culture and current topics from Spain and Latin America. Development of informal oral and written expression. Note: Students may not enroll in any lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed SPAN 1020 or equivalent, or have taken two years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 1020 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 2120 - Second Year Spanish II

Continues the development of skills acquired in SPAN 1010, 1020 and 2110, together with a review of grammar. Readings deal with Hispanic culture and literature. Development of informal oral and written expression. SPAN 2120 satisfies the fourth-semester language requirement at most graduate schools. Note: Students may not enroll in any

lower division (1000/2000) language skills course in which their level of proficiency exceeds that of the course. Students placing into a course through any means other than following the regular sequence must consult with an appropriate faculty member of the Dept. of Modern Languages prior to enrollment. Note: This course assumes that students have passed SPAN 2110 or equivalent, or have taken three years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2110 is recommended for success in this course. This course is not intended for native speakers. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 2125 - Spanish For Heritage Speakers I

Designed for native speakers with strong oral skills, but who need extra attention to writing, reading comprehension, grammatical knowledge and the vocabulary of formal Spanish. Complements and builds on the students' heritage language skills. Note: This course is for individuals who grew up in Spanish speaking environments but had little or no formal instruction in Spanish. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 2126 - Spanish for Heritage Speakers II

Continuation of SPAN 2125, designed for native speakers with strong oral skills, but who need extra attention to writing and grammatical knowledge and the vocabulary of formal Spanish. Compliments and builds on the student's heritage language skills. Note: This course is for individuals who grew up in Spanish speaking environments but had little or no formal instruction in Spanish. This course assumes that students have passed SPAN 2125 or equivalent. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 2130 - Current Topics in the Spanish-Speaking World

A fourth-semester course (parallel to 2120) designed for students majoring or minoring in international affairs, but open to anyone wishing to continue the study of Spanish beyond 2110. Along with development of language skills and grammar review, class work involves contemporary topics in cultural, political, economic and social affairs. Note: This course assumes that students have passed SPAN 2110 or equivalent, or have taken three years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2110 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Sophomore standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SPAN 2995 - Travel Study

For students doing travel study in a Spanish-speaking country; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

SPAN 3010 - Spanish Composition I

Expansion and reinforcement of oral and written skills in Spanish at an advanced level, in a broad cultural context. Oral activities are individual and in groups. Topics are introduced through oral activities, and are then used for written

assignments. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3020 - Spanish Composition II

(Continuation of SPAN 3010.) Development of oral and written skills in Spanish in preparation for taking other advanced courses. Topics of increasing complexity are selected from current publications in Spanish. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3030 - Spanish Oral Proficiency

This course is designed to help students acquire an "Intermediate High" level of proficiency in speaking and understanding spoken Spanish. Content-based instruction in small groups. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3050 - Advanced Spanish Grammar

A close study of the structure of the language and practice in its written use. Note: Recommended for those intending to teach Spanish at the secondary level. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3060 - Hispanic Phonetics: Theory and Practice

Explores the phonetics of spoken Spanish throughout the world. Theoretical content: classification of all Spanish sounds and how they are affected and change according to their phonetic environment and region. Practical features: pronunciation and strategies teaching English speakers to pronounce Spanish. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3101 - Introduction to the Study of Literature

The basic terms and skills needed to analyze both the themes and form of literary works, together with an introduction to research skills. All literary examples come from Hispanic literature. Note: SPAN 3252 is a prerequisite (previous or concurrent) to all other literature courses taught in Spanish. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade

of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. This course is a prerequisite/corequisite for all other literature courses taught in Spanish. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3199 - Topics in Spanish Literature

Varying topics in Hispanic literature appropriate the 3000 level, not otherwise covered by regular courses. Note: Taught in Spanish for major and minor credit. May be taken more than once, provided that the topic is different each time. Prereq or Coreq: SPAN 3101. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPAN 3212 - Spanish American Culture and Civilization

Surveys the social, political, economic, religious, literary, and artistic life of Spanish America from the conquest to the present. Note: Taught in Spanish for major and minor credit. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3213 - Contemporary Latin American Culture and Institutions

Introduction to contemporary Latin American culture and institutions, with emphasis on the social, economic and political institutions of Spanish-speaking countries. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3221 - Culture and Civilization of Spain I

From prehistoric times through Phoenician, Greek, Roman, and Visigothic eras to the Moorish invasion in 711; the Arab period; the Reconquest; the Catholic Kings; the Imperial Period; and the Inquisition. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3222 - Culture and Civilization of Spain II

(Continuation of 3221.) Studies the social, intellectual, and artistic development of Spain from the time of the Bourbons (18th century) through the civil war of 1936, and the Franco regime to the restoration of democracy under Juan Carlos I and the present day. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3223 - Contemporary Spanish Culture and Institutions

A study of contemporary Iberian culture, including an emphasis on modern business institutions and practices. This course can be applied to any Spanish major track but is specifically required for the International Language and Culture

for the Professions track. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3225 - Special Topics In Hispanic Culture

Variable topics in advanced studies in Spanish and Latin American culture. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPAN 3230 - Ibero-American Cultures through Film

A study of the Ibero-American cultures through their most representative films. Films will be windows to access the complexities and the contradictions lived in Ibero-American countries regarding a set of contemporary issues, such as violence, linguistic diversity, religious beliefs, sexuality, politics, history, social class, and globalization. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3240 - Food Metaphors: Ibero-American Cuisine and Culture

Intermediate/advanced Spanish students study interactions between Ibero-American cuisine and cultures. While improving Spanish skills, students learn how to cook Hispanic meals, study scholarly materials on food and cultures, watch films featuring meals as protagonists and read literary works of fiction and poetry. Taught in Spanish. Note: This course assumes that students have passed SPAN 2120 or 2130 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 or 2130 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3270 - Bilingual Communities: Spanish as a Language of Contact

Explores bilingualism by tracing the series of linguistic and ethnic contacts that converted Castilian from a Latin dialect to the language of the Spanish empire, the primary language of Latin America, and a fast-growing language in the United States. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3400 - Survey of Spanish Literature I

The most important works in the literature of Spain from the early Hispano-Arabic lyric poems through the golden age of the 17th century. Prereq or coreq: SPAN 3101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3410 - Survey of Spanish Literature II

The most important works in the literature of Spain from the 18th century to the present. Prereq or coreq: SPAN 3101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3510 - Survey of Spanish American Literature II

The most important works in the literature of Spanish America from the late 19th century to the present. Prereq or coreq: SPAN 3252. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3550 - Spanish American Short Story

The Spanish American short story from its beginnings in the romantic period of the 19th century to the present. Prereq or Coreq: SPAN 3101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3700 - Spanish for International Business I

Development of proficiency in oral and written Spanish as used in business and industry throughout the Hispanic world, together with an increased awareness of social, economic, and political conditions affecting business transactions, particularly in long-term operations. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3710 - Spanish for International Business II

(Continuation of SPAN 3700.) Further development of oral and written language proficiency, together with further examination of pertinent social, economic, and political conditions of the Hispanic world. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. SPAN 3700 desirable. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3730 - Special Topics in Spanish for International Business

Variable topics not otherwise covered sufficiently in regular courses. Note: May be taken more than once, provided that the topic is different each time. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 15 Credits. **Semester Hours:** 3 to 3

SPAN 3782 - Introduction to Translation I

The first course in a two-semester sequence that introduces the methodology and practice of written translation. Thorough analysis of source texts precedes translation into target language. Students must demonstrate third-year competence in Spanish and advanced writing skills in English. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A

grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3792 - Introduction to Translation II

Second course in a two-semester sequence (see SPAN 3082). Note: This course assumes that students have passed SPAN 2120 or equivalent, or have taken four years of high school Spanish, or possess equivalent proficiency. A grade of C- or higher in SPAN 2120 is recommended for success in this course. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 3840 - Independent Study: SPAN

Max hours: 6 Credits. **Semester Hours:** 1 to 3

SPAN 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Junior standing. Max hours: 9 Credits. **Semester Hours:** 1 to 3

SPAN 3995 - Travel Study

For students doing travel study in a Spanish-speaking country; register through the Office of International Education. Max hours: 15 Credits. **Semester Hours:** 1 to 15

SPAN 4010 - History of the Spanish Language

Studies the history of the Spanish language, both internal and external, from the language's Latin roots to the present. Historical phonetics are emphasized, though all features of the language are discussed. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4020 - Spanish Sociolinguistics

Studies the Spanish language in its social context. In addition to specific regional linguistic features, social factors such as geography, social class, politics, race, gender, economics, education and history are discussed as determiners of the linguistic landscape. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4060 - Dialects of the Spanish-Speaking World

Studies the geography of the Spanish language in those countries where it is spoken as a primary language. Includes a comparison of dialect features and a study of factors that contribute to the diversity of the Spanish language. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4070 - Spanish Applied Linguistics & Second Language Acquisition

This course is a survey of various areas of the field of linguistics in general (e.g. morphology, syntax, semantics, pragmatics, etc.) as well as specific aspects of the structure (and acquisition) of the Spanish language. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5070. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4076 - Spanish in Colorado

A study of the Spanish language in its social context in Colorado and New Mexico. We will study historical factors as well as current social factors that contribute to the use of the Spanish language in this region. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5076. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4080 - Spanish in the United States

A study of the Spanish language in its social context as a language of the United States. In addition to studying bilingualism and language traits, factors such as race, gender, class, education, nationality, age, generation and language attitudes are considered. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4099 - Special Topics in Linguistics

Varying topics in Hispanic language and literature not otherwise covered by regular courses. Note: May be taken more than once provided that the topics are different each time. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq or Coreq: SPAN 3060. Cross-listed with SPAN 5099. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPAN 4110 - Contemporary Spanish Literature

Major works published since the Spanish Civil War, which ended in 1939. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4130 - Medieval Spanish Literature

Examines Spanish literature from the jarchas and the Cid through the Celestina in the context of the reconquest. Considers the construction of the Christian knight as a hero and the corresponding representations of women, Jews and Muslims. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5130. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4150 - Masterpieces of Spanish Literature

The most enduring works in the literature of Spain across the centuries. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4170 - Golden Age Drama

Spanish drama of the 16th and 17th centuries, the period of greatest dramatic productivity in the nation's history. Readings include selections from Lope de Vega, Tirso de Molina, Calderon de La Barca, and others. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5170. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4180 - Modernism

Examines the first real flowering of Spanish American literature, from about 1880 to 1910. The dominant genres of the period were the short story, the essay and lyric poetry. Readings come from Dario, Jose Enrique Rodo, Manuel Gutierrez Najera, Manuel Diaz Rodriguez and others. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5180. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4190 - Nineteenth-Century Spanish Novel

The Spanish novel in one of its most productive periods, beginning with romanticism and carrying through the realist and naturalist movements. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5190. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4300 - Generation of 1898

Spanish literature from around the turn of the century through the first third of the 20th century, reflecting the deep intellectual and cultural foment occasioned in part by Spain's loss of the Spanish-American War of 1898. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4320 - Interculturalism and Transnationalism in Modern Spain

Students will examine experiences of Spaniards living in different parts of the world and the circumstances of either foreigners or migrants living in Spain, through their visual and literary texts, film, photographs, documentaries and other products of current popular culture, such as contemporary television. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4330 - Modern Culture of Spain through Film and Narrative

Culture of modern Spain studied through Spanish film. The death of military dictator Francisco Franco opened the process for the recuperation of a usurped democratic, representational system that has become the basis of a cultural and economic resurgence. Taught in Spanish. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4340 - Race, Class, and Gender in Spanish Golden Age Literature

Explores works of various genres in relation to their social and political contexts in 16th and 17th century Spain, emphasizing the cultural attitudes toward race, class, and gender that inform them. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5340 and WGST 4540/5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4350 - Don Quijote

The complete Don Quijote in Spanish, focusing on its historical, social, and philosophic context, and its role in the emergence of the modern novel. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4360 - Women and the Spanish Civil War

Focuses on the role of Spanish women during the Second Republic, the Civil War, the dark & starving postwar, & the inescapable exile that was a consequence of the conflict. Discusses several texts & films that portray this silenced odyssey, as well as historical, ideological & cultural documents of critical value & significance. Cross-listed with SPAN 5360. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4380 - Romanticism in Spain

The romantic movement in 19th century Spain through plays, poems, essays. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5380. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4399 - Special Topics: Spanish Peninsular Literature

Varying topics in Spanish Peninsular Literature not otherwise covered by regular courses. Note: May be taken more than once, provided that the topic is different each time. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Prereq or Coreq: SPAN 3101. Max hours: 6 hours. **Semester Hours:** 3 to 3

SPAN 4401 - Survey of Spanish-American Literature I: Pre-1898

The most important works in the literature of Spanish America from the Colonial Period to the Late 19th Century. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4411 - Contemporary Spanish-American Novel

The novel in Spanish America since the Second World War, the period in which the greatest number and quality of works has been produced. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4450 - Masterpieces of Spanish-American Literature

Focuses on a limited number of outstanding works in Spanish-American literature across the centuries. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4501 - Borges: An Introduction to His Labyrinths

The works of Jorge Luis Borges (short stories, essays, poetry, translations, essays anthologies, lectures) will be studied with the goals of teaching students to think globally as well as critically about literature and other cultures. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4512 - Contemporary Argentine Short Stories

The short stories by extraordinary Argentine writers, such as Jorge Luis Borges, Silvina Ocampo, Julio Cortazar, Griselda Gambaro, Adolfo Bioy Casares, and Manuel Muica Laineza, among others, will be studied with the goals of teaching students to think globally as well as critically about literature and other cultures. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5512. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4521 - Mexican Literature I: pre-Columbian and Colonial

Survey of Mexican literature and culture from pre-Columbian times to the colonial era. Prereq or Coreq: SPAN 3101. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Cross-listed with SPAN 5521. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4522 - Mexican Literature II: 19th to 21st Centuries

Survey of Mexican literature and culture from the early modern to contemporary literature. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5522. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4525 - Orientalisms In The Hispanic Tradition

Advanced studies of orientalism in the Hispanic tradition: the Hispano-Arabic cultural heritage in Early Medieval Spain and in contemporary Hispanic cultures, as well as the influence of other eastern religions and cultures, such as Judaism or Buddhism. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5525. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4541 - Unexpected Lives: Ibero-American Queer Cinema

Provocative films, by courageous Ibero-American filmmakers, on controversial topics (homosexuality, Lesbianism, bisexuality, transgender individuals, feminism, etc.) will be studied to teach students to think globally as well as critically about LGBTQ individuals in the context of Ibero-American cultures. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5541. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4550 - Garcia Marquez: Words of Magic

The works of Gabriel Garcia Marquez (stories, short novels, novels, newspaper articles, interviews, lectures) will be studied with the goals of teaching students to think globally as well as critically about literature and other cultures. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4590 - Ibero-American Thought

The course examines philosophical works by essayists, literary critics, and cultural thinkers from Spanish-American countries and the Iberian Peninsula. Besides reading philosophical works in their original form, students will read scholarly commentaries to deepen their understanding of those works. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5590. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4599 - Special Topics: Latin American Literature

Varying topics in Latin American literature not otherwise covered by regular courses. Note: May be taken more than once, provided that the topic is different each time. Prereq or Coreq: SPAN 3101. Max hours: 6 Credits. **Semester Hours:** 3 to 3

SPAN 4600 - Seminar in Spanish Creative Writing: Poetry and Short Fiction

A capstone writing course. Semester writing project will be collected poems and short stories. Prereq: junior standing or higher. Cross-listed with SPAN 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 4840 - Independent Study: SPAN

Max hours: 12 Credits. **Semester Hours:** 1 to 3

SPAN 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SPAN 4970 - Special Topics in Literature

Varying topics in Hispanic literature not otherwise covered by regular courses. Note: May be taken more than once, provided that the topic is different each time. Prereq or Coreq: SPAN 3101. Cross-listed with SPAN 5970. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPAN 5000 - Introduction to Graduate Studies in Spanish

Introduces critical methodologies and critical perspectives of practices of signification such as literature and film, among others, in the context of culture and history. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5010 - History of the Spanish Language

Studies the history of the Spanish language, both internal and external, from the language's Latin roots to the present.

Historical phonetics are emphasized, though all features of the language are discussed. Prereq: Graduate standing. Cross-listed with SPAN 4010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5020 - Spanish Sociolinguistics

Studies the Spanish language in its social context. In addition to specific regional linguistic features, social factors such as geography, social class, politics, race, gender, economics, education and history are discussed as determiners of the linguistic landscape. Prereq: Graduate standing. Cross-listed with SPAN 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5060 - Dialects of the Spanish-Speaking World

Studies the geography of the Spanish language in those countries where it is spoken as a primary language. Includes a comparison of dialect features and a study of factors that contribute to the diversity of the Spanish language. Prereq: Graduate standing. Cross-listed with SPAN 4060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5070 - Spanish Applied Linguistics & Second Language Acquisition

This course is a survey of various areas of the field of linguistics in general (e.g. morphology, syntax, semantics, pragmatics, etc.) as well as specific aspects of the structure (and acquisition) of the Spanish language. Prereq: Graduate standing. Cross-listed with SPAN 4070. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5076 - Spanish in Colorado

A study of the Spanish language in its social context in Colorado and New Mexico. We will study historical factors as well as current social factors that contribute to the use of the Spanish language in this region. Prereq: Graduate standing. Cross-listed with SPAN 4076. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5080 - Spanish in the United States

A study of the Spanish language in its social context as a language of the United States. In addition to studying bilingualism and language traits, factors such as race, gender, class, education, nationality, age, generation and language attitudes are considered. Prereq: Graduate standing. Cross-listed with SPAN 4080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5099 - Special Topics in Linguistics

Varying topics in Hispanic language and literature not otherwise covered by regular courses. Note: May be taken more than once provided that the topics are different each time. Prereq: graduate standing. Cross-listed with SPAN 4099. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPAN 5110 - Contemporary Spanish Literature

Major works published since the Spanish Civil War, which ended in 1939. Prereq: Graduate standing. Cross-listed with SPAN 4110. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5130 - Medieval Spanish Literature

Examines Spanish literature from the jarchas and the Cid through the Celestina in the context of the reconquest. Considers the construction of the Christian knight as a hero and the corresponding representations of women, Jews and Muslims. Prereq: Graduate standing. Cross-listed with SPAN 4130. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5150 - Masterpieces of Spanish Literature

The most enduring works in the literature of Spain across the centuries. Prereq: Graduate standing. Cross-listed with SPAN 4150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5170 - Golden Age Drama

Spanish drama of the 16th and 17th centuries, the period of greatest dramatic productivity in the nation's history. Readings include selections from Lope de Vega, Tirso de Molina, Calderon de La Barca, and others. Prereq: graduate standing. Cross-listed with SPAN 4170. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5180 - Modernism

Examines the first real flowering of Spanish American literature, from about 1880 to 1910. The dominant genres of the period were the short story, the essay, and lyric poetry. Readings come from Dario, Jose Enrique Rodo, Manuel Gutierrez Najera, Manuel Diaz Rodriguez and others. Prereq: graduate standing. Cross-listed with SPAN 4180. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5190 - Nineteenth-Century Spanish Novel

The Spanish novel in one of its most productive periods, beginning with romanticism and carrying through the realist and naturalist movements. Prereq: graduate standing. Cross-listed with SPAN 4190. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5300 - Generation of 1898

Spanish literature from around the turn of the century through the first third of the 20th century, reflecting the deep intellectual and cultural foment occasioned in part by Spain's loss of the Spanish-American War of 1898. Prereq: Graduate standing. Cross-listed with SPAN 4300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5320 - Interculturalism and Transnationalism in Modern Spain

Students will examine experiences of Spaniards living in different parts of the world and the circumstances of either

foreigners or migrants living in Spain, through their visual and literary texts, film, photographs, documentaries and other products of current popular culture, such as contemporary television. Prereq: Graduate standing. Cross-listed with SPAN 4320. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5330 - Modern Culture of Spain through Film and Narrative

Culture of modern Spain studied through Spanish film. The death of military dictator Francisco Franco opened the process for the recuperation of a usurped democratic, representational system that has become the basis of a cultural and economic resurgence. Taught in Spanish. Prereq: graduate standing. Cross-listed with SPAN 4330. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5340 - Race, Class, and Gender in Spanish Golden Age Literature

Explores works of various genres in relation to their social and political contexts in 16th and 17th century Spain, emphasizing the cultural attitudes toward race, class, and gender that inform them. Prereq: graduate standing. Cross-listed with SPAN 4340 and WGST 4540/5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5350 - Don Quijote

The complete Don Quijote in Spanish, focusing on its historical, social, and philosophic context, and its role in the emergence of the modern novel. Prereq: graduate standing. Cross-listed with SPAN 4350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5360 - Women and the Spanish Civil War

Focuses on the role of Spanish women during the Second Republic, the Civil War, the dark & starving postwar, & the inescapable exile that was a consequence of the conflict. Discusses several texts & films that portray this silenced odyssey, as well as historical, ideological & cultural documents of critical value & significance. Cross-listed with SPAN 4360. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5380 - Romanticism in Spain

The romantic movement in 19th century Spain through plays, poems, essays. Prereq: graduate standing. Cross-listed with SPAN 4380. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5399 - Special Topics: Spanish Peninsular Literature

Varying topics in Spanish peninsular literature not otherwise covered by regular courses. Note: May be taken more than once, provided that the topic is different each time. Prereq: graduate standing. Max hours: 6 Credits. **Semester Hours:** 3 to 3

SPAN 5401 - Survey of Spanish-American Literature I: Pre-1898

The most important works in the literature of Spanish America from the Colonial Period to the Late 19th Century. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-listed with SPAN 4401. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5411 - Contemporary Spanish-American Novel

The novel in Spanish America since the Second World War, the period in which the greatest number and quality of works has been produced. Prereq: graduate standing. Cross-listed with SPAN 4411. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5450 - Masterpieces of Spanish-American Literature

Focuses on a limited number of outstanding works in Spanish-American literature across the centuries. Prereq: graduate standing. Cross-listed with SPAN 4450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5501 - Borges: An Introduction to His Labyrinths

The works of Jorge Luis Borges (short stories, essays, poetry, translations, essays anthologies, lectures) will be studied with the goals of teaching students to think globally as well as critically about literature and other cultures. Prereq: graduate standing. Cross-listed with SPAN 4501. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5512 - Contemporary Argentine Short Stories

The short stories by extraordinary Argentine writers, such as Jorge Luis Borges, Silvina Ocampo, Julio Cortazar, Griselda Gambaro, Adolfo Bioy Casares, and Manuel Muica Laineza, among others, will be studied with the goals of teaching students to think globally as well as critically about literature and other cultures. Prereq: graduate standing. Cross-listed with SPAN 4512. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5521 - Mexican Literature I: pre-Columbian and Colonial

Survey of Mexican literature and culture from pre-Columbian times to the colonial era. Prereq: graduate standing. Cross-listed with SPAN 4521. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5522 - Mexican Literature II: 19th to 21st Centuries

Survey of Mexican literature and culture from the early modern to contemporary literature. Prereq: graduate standing. Cross-listed with SPAN 4522. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5525 - Orientalisms In The Hispanic Traditions

Advanced studies of orientalism in the Hispanic tradition: the Hispano-Arabic cultural heritage in Early Medieval Spain and in contemporary Hispanic cultures, as well as the influence of other eastern religions and cultures, such as

Judaism or Buddhism. Prereq: graduate standing. Cross-listed with SPAN 4525. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5541 - Unexpected Lives: Ibero-American Queer Cinema

Provocative films, by courageous Ibero-American filmmakers, on controversial topics (homosexuality, Lesbianism, bisexualism, transgender individuals, feminism, etc.) will be studied to teach students to think globally as well as critically about LGTBQ individuals in the context of Ibero-American cultures. Prereq: graduate standing. Cross-listed with SPAN 4541. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5550 - Garcia Marquez: Words of Magic

The works of Gabriel Garcia Marquez (stories, short novels, novels, newspaper articles, interviews, lectures) will be studied with the goals of teaching students to think globally as well as critically about literature and other cultures. Prereq: graduate standing. Cross-listed with SPAN 4550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5590 - Ibero-American Thought

The course examines philosophical works by essayists, literary critics, and cultural thinkers from Spanish-American countries and the Iberian Peninsula. Besides reading philosophical works in their original form, students will read scholarly commentaries to deepen their understanding of those works. Prereq: graduate standing. Cross-listed with SPAN 4590. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5599 - Special Topics: Latin American Literature

Varying topics in Latin American literature not otherwise covered by regular courses. Note: May be taken more than once, provided that the topic is different each time. Prereq: graduate standing. Max hours: 6 hours. **Semester Hours:** 3 to 3

SPAN 5600 - Seminar in Spanish Creative Writing: Poetry and Short Fiction

A capstone writing course. Semester writing project will be collected poems and short stories. Prereq: graduate standing. Cross-listed with SPAN 4600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPAN 5840 - Independent Study: SPAN

Max hours: 3 Credits. **Semester Hours:** 1 to 3

SPAN 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SPAN 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

SPAN 5950 - Master's Thesis

This course is for students writing a master's thesis. It includes individual mentoring with one or more faculty members, individualized and library-based research. May also include field research. Students must consult with a faculty member before enrolling. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SPAN 5970 - Special Topics in Literature

Varying topics in Hispanic literature not otherwise covered by regular courses. Prereq: Graduate standing. Cross-listed with SPAN 4970. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPED 4010 - Intentional Interventions for Exceptional Learners

This course provides instructional strategies and interventions for students with a wide variety of disabilities. Implications for targeted and intensive interventions and assessment are considered. Cross-listed with SPED 5010. Max hours: 3 Credits **Semester Hours:** 3 to 3

SPED 4030 - Understanding (dis)Ability in Contemporary Classrooms

This course provides an overview of special education by examining the history of special education, construction of dis/ability, characteristics of individuals with disabilities, aspects of disproportionality, and introduction to evidence-based instructional practices. Prereq: EDFN 4010 and CLDE 4020. Cross-listed with SPED 5030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4140 - Assessment: Inquiry, Instruction, & Intervention

Using a variety of assessment tools, students will focus on the educational assessment methods and procedures used in decision making and program planning for students with exceptional learning needs, with attention to pervasive issues pertaining to students from culturally and linguistically diverse backgrounds. Cross-listed with SPED 5140. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4151 - Slashing Stigmas: Promoting Positive Behaviors

This course works to transform perspectives and practices related to supporting student behavior in classrooms. Students will learn important considerations related to culture, race, gender and socioeconomic status, as they intersect with behavior and social emotional development. Cross-listed with SPED 5151. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4201 - Ecological Systems for Social Emotional Development

Provides a broad overview of the ecological perspectives of social and emotional development of children and adolescents in the school community. The overall purpose is to understand a holistic picture of individuals with mental illness and/or challenging behaviors and to build skills and strategies that enhance a professional's ability to work with and build social and emotional intelligence, executive functioning, bully strategies, and mental health. Cross-listed with SPED 5201. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4300 - Family, Professional, and Community Collaboration

Focuses on the development of competencies in consultation and collaboration. The overall purpose is to encourage the development of understanding and skills that enhance a teacher's ability to work and communicate effectively with school personnel, including paraprofessionals and parents. The goal of collaboration is to support and determine together the instructional scenarios that best meet the needs of students. Specific competencies include problem solving, conflict resolution, data collection or observation skills, conferencing, facilitating meetings, and interacting with others while respecting diverse discourses and multicultural backgrounds. Cross-listed with SPED 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4400 - Universal Design for Learning (UDL)

This course introduces Universal Design for Learning (UDL), an important educational philosophy and set of principles & techniques that focuses on strategies and tools to help ALL students by accommodating their differences in inclusive classroom settings. Cross-listed with SPED 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4500 - Transition and Secondary Methods in Special Education

This course provides school leaders and practitioner with an understanding of the special education transition process as specified by federal and state guidelines, as well as effective teaching and learning strategies for secondary youth with disabilities. Cross-listed with SPED 5500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4600 - Special Education Law: Ethics and Compliance

Designed for school leaders and professionals to understand special education law and compare and contrast service delivery options . Cross-listed with SPED 5600. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4710 - Significant Health Support Needs Academy

Intends to prepare paraeducators with knowledge and skills needed for working with children with significant health support needs. Consisting of seven modules of varying length, this 15 clock hour academy focuses on training both the health aid and the significant health support needs professional. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4720 - Significant Supports for Challenging Behavior Academy

This academy provides the paraeducator with the knowledge and skills needed for working with children who have significant behavior needs. The academy focuses on working with students who have challenging behaviors. The aim is to provide paraeducators with the basic understanding of behavior support and to provide them with the necessary skills

to implement written behavior support plans. It is recommended that paraeducators complete the Behavior Management Academy prior to taking this course. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4730 - Significant Communication Support Needs Academy

This academy provides the paraeducator with the knowledge and skills needed for working with children who have significant behavior needs. The academy focuses on working with students who have challenging behaviors. Its aim is to provide paraeducators with a basic understanding of behavior support and to provide them with the necessary skills to implement written behavior support plans. It is recommended that paraeducators complete the Behavior Management Academy prior to taking this course. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4740 - Intersections of Literacy, Culture, & Exceptionality

This course provides a foundational understanding of the complex intersections between literacy, culture, language, learning, and students with (dis)abilities. A primary goal is to address the particular needs of culturally and linguistically diverse learners with exceptionalities, while also exploring the distinctions between language development and learning disabilities. Cross-listed with SPED 5740. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4750 - Orientation to Special Education

This 15 clock hour academy is designed to provide a basic introduction to special education and the needs of students who have disabilities. It includes introductory material regarding legal and historical foundations of special education, human growth and development, the nature of disabilities, and an introduction to the basic human needs that must be addressed. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4780 - Literacy Interventions in Special Education

Provides the practitioner with an understanding of research-validated approaches, strategies, assessment tools and issues related to effective literacy instruction for students performing significantly below grade level. Cross-listed with SPED 5780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 4800 - Orientation to Early Intervention Services

This academy provides Developmental Intervention Assistant (DI Assistant) an introduction to early intervention services under IDEA. Material regarding legal and historical foundations, human growth and development, and the nature of disabilities and their impact on infants and toddlers are introduced. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4805 - Fundamentals of the IFSP Process

This academy provides Developmental Intervention Assistants an overview of the Individualized Family Service Plan (IFSP). It clarifies their role in the implementation of IFSP and also knowledge about the evaluation and assessment components of the IFSP process. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4810 - Early Intervention Teamwork

This academy is designed for Developmental Intervention Assistants (DI Assistants) to work effectively in Early Intervention teams. Introductory materials regarding teamwork, delineation of DI Assistants' and supervisors' roles and responsibilities as well as family centered practices are addressed. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4815 - Working with Families

This academy provides the Developmental Intervention Assistant with information and skills to create and support Family Centered Practices. Focus on the concept of family and the impact of disability on the family is woven throughout the course. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4820 - Instructional Strategies for Early Intervention

This academy assists the Developmental Intervention Assistant in examining the types of instructional strategies used in the Early Intervention programs. Focus is on building relationships, promoting engagement, and instructional support specifically in collecting data for the supervisor and IFSP team. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4825 - Promoting Social Emotional Development

This academy focuses on the importance of infant/toddlers' social emotional development and support. The CSEFEL Pyramid Model, adapted for this course, is a conceptual framework of evidence-based practices addressing the promotion of social emotional development in early intervention programs. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4830 - Health Support Needs in Early Intervention

This academy provides the DI Assistant with information and skills to support the health services related to the early intervention programs. Safety awareness and precautions are stressed as related to caring for infants/toddlers in their home and natural environments. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4835 - Language and Early Literacy Development

This academy is designed for Developmental Intervention Assistant (DI Assistant) to work effectively with families as they support the early language and literacy development of their infants and toddlers with communication challenges. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4840 - Communication Support Needs Early Intervention

This academy provides the Developmental Intervention Assistant with information and skills to learn characteristic language patterns for infants and toddlers. Focus on critical importance of child interactions as well as key intervention communication strategies for infants and toddlers. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4845 - Individualized Intervention Infants/Toddlers

This academy, adapted from CSEFEL, introduces Developmental Intervention Assistants (DI Assistants) to basic knowledge of infants/toddlers with challenging behaviors. It provides necessary skills to implement written behavior support plans based on the IFSP under the supervision of Early Intervention professionals. Max hours: 1 Credit.

Semester Hours: 1 to 1

SPED 4850 - Transition to Age 3

This academy assists the Developmental Intervention Assistant in learning the elements of transition from Part C to Part B including the difference between an IFSP and IEP. Focus on the cultural and transition issues for the toddler and the family. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4855 - Interpersonal Skills for DI Assistants

This academy provides the Developmental Intervention Assistant effective interpersonal skills necessary to work with Early Intervention teams. It addresses issues of diversity based on culture, experience, gender, etc. and examines the DI Assistants' roles in each aspect of the topics. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4860 - Personal Growth Development for DI Assistants

This academy provides the Developmental Intervention Assistant with information and skills to identify and expand personal growth and improvement skills working in Early Intervention programs. The course covers stress-management strategies and uses creativity and flexibility in dealing with problematic situations. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4865 - Instructional & Assistive Technology in EI

This academy assists the Developmental Intervention Assistants in examining various types of instructional and assistive technology used in early intervention programs. Focus is on technology used in the home and other natural environments to assist the infant/toddler and the family. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4870 - Autism Spectrum Disorder in Early Intervention

This academy provides Developmental Intervention Assistants with information to assist the Early Intervention Professionals to implement instructions for infants/toddlers identified with autism. It offers participants knowledge of structured tasks environmental adaptations, and appropriate social skills for the infant/toddler and family. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPED 4910 - Special Education Generalist Internship and Site Seminar I

Special education teacher candidates engage in systematic observation of, participation in, design of and reflection on inclusive curricular, instruction and management practices. Graduated learning activities for each internship and time

requirements are specified in the School Internship handbook and the Special Education Guidelines. In partner school, the site coordinator and site professor are responsible for coaching, supervision and site seminars. In internship outside partner school settings, cooperating teachers, district coordinators and/or university professors work with teacher candidates in the classroom and in seminars. Prereq: Completion of special education core or permission of instructor and advisor. Admission into the IPTE Program. Cross-listed with SPED 5910. Max hours: 8 Credits. **Semester Hours:** 1 to 8

SPED 4915 - Practicum For Developmental Intervention Assistant

The Developmental Intervention Assistant will engage in systematic observation of, and participation in the delivery of early intervention services. Practicum Instructor will observe, coach and assess as per the performance criteria required for completing the DI Assistant portfolio. Prereq: SPED 4800, 4805, 4810, 4815, 4820, 4825, 4830, 4835, 4840, 4845, 4850, 4855, 4860, 4865, & 4870. Max hours: 9 Credits. **Semester Hours:** 2 to 2

SPED 4919 - CO-TOP Practicum

The paraeducator engage in systematic observation of, and participation in instruction of management practices. The learning activities for each practicum are specified in the CO-TOP Practicum handbook and information sheet. Cooperating teachers, district coordinators and/or university-based supervision observe paraeducators in the classroom. Prereq: Completion of CO-TOP academies or permission of the CO-TOP Coordinator. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SPED 5000 - Universal Design for Learning (UDL)

This course introduces Universal Design for Learning (UDL), an important educational philosophy and set of principles & techniques that focuses on strategies and tools to help ALL students by accommodating their differences in inclusive classroom settings. Cross-listed with SPED 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5010 - Intentional Interventions for Exceptional Learners

This course provides instructional strategies and interventions for students with a wide variety of disabilities. Implications for targeted and intensive interventions and assessment are considered. Cross-listed with SPED 4010. Max hours: 3 Credits **Semester Hours:** 3 to 3

SPED 5030 - Understanding (dis)Ability in Contemporary Classrooms

This course provides an overview of special education by examining the history of special education, construction of dis/ability, characteristics of individuals with disabilities, aspects of disproportionality, and introduction to evidence-based instructional practices. Prereq: EDFN 5010 and CLDE 5020. Cross-listed with SPED 4030. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5050 - Assessment & Advocacy for Multilingual Learners

Students learn to gather and use assessment results within a strengths-based framework to advocate for appropriate programming, placement, instruction, and ongoing progress monitoring of multilingual students. Special attention is

paid to linguistic and cultural bias in the field of assessment. Cross-listed with CLDE 5050. Max hours: 3 Credits.

Semester Hours: 3 to 3

SPED 5120 - Negotiating The Special Education Teaching Process

This course explores both theoretical and practical aspects of educating students with special needs. Students will examine the nature of disability, the history and legal basis for special education programming in American schools, as well as contemporary law governing the education of persons with disabilities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5140 - Assessment: Inquiry, Instruction, & Intervention

Using a variety of assessment tools, students will focus on the educational assessment methods and procedures used in decision making and program planning for students with exceptional learning needs, with attention to pervasive issues pertaining to students from culturally and linguistically diverse backgrounds. Cross-listed with SPED 4140. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5151 - Slashing Stigmas: Promoting Positive Behaviors

This course works to transform perspectives and practices related to supporting student behavior in classrooms. Students will learn important considerations related to culture, race, gender and socioeconomic status, as they intersect with behavior and social emotional development. Prereq: UEDU 4030/5030 if students are in the initial licensure program. Cross-listed with SPED 4151. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5201 - Ecological Systems for Social Emotional Development

Provides a broad overview of the ecological perspectives of social and emotional development of children and adolescents in the school community. The overall purpose is to understand a holistic picture of individuals with mental illness and/or challenging behaviors and to build skills and strategies that enhance a professional's ability to work with and build social and emotional intelligence, executive functioning, bully strategies, and mental health. Cross-listed with SPED 4201. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5300 - Family, Professional, and Community Collaboration

Focuses on the development of competencies in consultation and collaboration. The overall purpose is to encourage the development of understanding and skills that enhance a teacher's ability to work and communicate effectively with school personnel, including paraprofessionals and parents. The goal of collaboration is to support and determine together the instructional scenarios that best meet the needs of students. Specific competencies include problem solving, conflict resolution, data collection or observation skills, conferencing, facilitating meetings, and interacting with others while respecting diverse discourses and multicultural backgrounds. Cross-listed with SPED 4300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5401 - Action Research and Leadership in Special Education

Designed to allow an opportunity for special educators to compare and contrast the service delivery, funding

mechanisms, professional ethics, and underlying assumptions of special and regular education. Trends in the field of special education are examined through review of current research. Prereq: SPED 5600, SPED 5010, SPED 5140, SPED 5151, SPED 5300, SPED 5740, SPED 5780 or permission of the instructor. Max hours: 6 Credits. **Semester Hours:** 3 to 3

SPED 5440 - Ethics and Implementation ABA

This course is designed to teach you ethical and professional conduct considerations in applied behavior analysis. We will review behavior change systems and implementation issues in the conduct of applied behavior analysis. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5450 - Introduction to ABA and Terminology

This course will introduce the history and basics of ABA with a focus on its related terminology. In addition, ABA benefits will be discussed, and emphasis placed on ethical considerations required for practicing ABA as a board Certified Behavior Analyst. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5460 - ABA Practical Applications

This course will provide a framework for the natural science of behavior. It will provide students with a systematic approach to understanding and precisely describing the behavior of individuals, and its relationship to environmental determinants. Prereq: SPED 5450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5470 - ABA Data

This course will introduce how to collect and interpret different types of data, and the importance of making data-driven decisions for behavior change procedures based on functional relationships. Prereq: SPED 5450, 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5480 - ABA Advanced Data and Behavioral Plans and Applications

Student will learn to use standard celeration charts and make data-driven decisions to write appropriate behavioral plans. They will also learn to use ABA strategies to enhance communication, to support individuals with ASD, and to benefit from systems supports. Prereq: SPED 5450, 5460, 5470. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5490 - Autism In Early Intervention

This course will provide students with the knowledge necessary to implement recommended, evidence-based practices with young children with autism. The course will provide information on the etiology of autism, diagnostic procedures, evidence-based practices, and how to support families who have a young child diagnosed on the spectrum. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5500 - Transition and Secondary Methods in Special Education

This course provides school leaders and practitioner with an understanding of the special education transition process as specified by federal and state guidelines, as well as effective teaching and learning strategies for secondary youth with disabilities. Cross-listed with SPED 4500. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5530 - Language & Literacy Acquisition Div Lrn

This course investigates the relationship between language and literacy acquisition. In the context of first and second language acquisition across the lifespan, the course focuses on bilingual and second language development, and on the acquisition of literacy by young children. Prereq: SPED 5740. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5600 - Special Education Law: Ethics and Compliance

Designed for school leaders and professionals to understand special education law and compare and contrast service delivery options . Cross-listed with SPED 4600. Max hours: 6 Credits. **Semester Hours:** 3 to 3

SPED 5740 - Intersections of Literacy, Culture, & Exceptionality

This course provides a foundational understanding of the complex intersections between literacy, culture, language, learning, and students with (dis)abilities. A primary goal is to address the particular needs of culturally and linguistically diverse learners with exceptionalities, while also exploring the distinctions between language development and learning disabilities. Cross-listed with SPED 4740. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5780 - Literacy Interventions in Special Education

Provides the practitioner with an understanding of research-validated approaches, strategies, assessment tools and issues related to effective literacy instruction for students performing significantly below grade level. Practitioners can expect to be able to conduct thorough literacy assessments as well as be able to develop, implement, and evaluate individual reading and writing programs for individual students with the most challenging literacy needs. Prereq: SPED 5740. Cross-listed with SPED 4780. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPED 5840 - Independent Study: SPED

Max hours: 4 Credits. **Semester Hours:** 1 to 4

SPED 5918 - ABA Practicum

Supervised field experience with a Board Certified Behavior Analyst for time spent directly working with individuals who require behavioral programming. Students must complete 1000 hours to meet BCBA requirements and 670 hours for BCaBA requirements. 100 hours is equivalent to 1 credit. Max hours: 10 Credits. **Semester Hours:** 0 to 4

SPED 5919 - ABA Intensive Practicum

Supervised field experience with a Board Certified Behavior Analyst for time spent directly working with individuals who require behavioral support. Students must complete 750 hours to meet BCBA requirements and 500 hours for BCaBA requirements. 75 hours is equivalent to 1 credit. Max hours: 9 Credits. **Semester Hours:** 0 to 5

SPED 5930 - Special Education Generalist Internship and Site Seminar I

Special education teacher candidates engage in systematic observation of, participation in, design of and reflection on inclusive curricular, instruction and management practices. Graduated learning activities for each internship and time requirements are specified in the School Internship handbook and the Special Education Guidelines. In partner school, the site coordinator and site professor are responsible for coaching, supervision and site seminars. In internship outside partner school settings, cooperating teachers, district coordinators and/or university professors work with teacher candidates in the classroom and in seminars. Prereq: Completion of special education core or permission of instructor and advisor. Cross-listed with SPED 5931, 5932, 5933. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SPED 5931 - Special Education Generalist Internship and Site Seminar II

Special education teacher candidates engage in systematic observation of, participation in, design of and reflection on inclusive curricular, instruction and management practices. Graduated learning activities for each internship and time requirements are specified in the School Internship handbook and the Special Education Guidelines. In partner school, the site coordinator and site professor are responsible for coaching, supervision and site seminars. In internship outside partner school settings, cooperating teachers, district coordinators and/or university professors work with teacher candidates in the classroom and in seminars. Prereq: SPED 5910. Cross-listed with SPED 5930, 5932, 5933. Max hours: 9 Credits. **Semester Hours:** 2 to 2

SPED 5932 - Special Education Generalist Internship and Site Seminar III

Special education teacher candidates engage in systematic observation of, participation in, design of and reflection on inclusive curricular, instruction and management practices. Graduated learning activities for each internship and time requirements are specified in the School Internship handbook and the Special Education Guidelines. In partner school, the site coordinator and site professor are responsible for coaching, supervision and site seminars. In internship outside partner school settings, cooperating teachers, district coordinators and/or university professors work with teacher candidates in the classroom and in seminars. Prereq: SPED 5910 and SPED 5911. Cross-listed with SPED 5930, 5931, 5933. Max hours: 9 Credits. **Semester Hours:** 2 to 2

SPED 5933 - Special Education Generalist Internship and Site Seminar IV

Special education teacher candidates engage in systematic observation of, participation in, design of and reflection on inclusive curricular, instruction and management practices. Graduated learning activities for each internship and time requirements are specified in the School Internship handbook and the Special Education Guidelines. In partner school, the site coordinator and site professor are responsible for coaching, supervision and site seminars. In internship outside partner school settings, cooperating teachers, district coordinators and/or university professors work with teachers, and candidates in the classroom and in seminars. Prereq: SPED 5910, SPED 5911, SPED 5912 or permission of instructor and/or advisor. Cross-listed with SPED 5930, 5931, 5932. Max hours: 9 Credits. **Semester Hours:** 3 to 8

SPED 6950 - Master's Thesis

Max hours: 16 Credits. **Semester Hours:** 4 to 4

SPSY 5600 - Behavior Analysis and Intervention

This course introduces knowledge and skills necessary for school psychologists to proactively address child problem behaviors. Content includes application of Positive Behavioral Support (PBS), functional behavior analysis and intervention, evaluation of behavior change. Relevant federal, state regulations are also addressed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 5800 - Workshop: Topics in School Psychology

Max hours: 15 Credits. **Semester Hours:** 1 to 6

SPSY 5840 - Independent Study: SPSY

Max hours: 9 Credits. **Semester Hours:** 1 to 4

SPSY 5900 - School-Based Multicultural Interventions

The course will foster students' understanding and appreciation of diversity and its applications for school psychology practice, educational contexts, and mental health policy. Students will learn to evaluate and implement school-based mental health and educational interventions with a multicultural lens. Prereq: SPSY 6410. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6000 - BrainSTARS: TBI-Strategies for Teams and Re-Educ

This interdisciplinary course provides a knowledge base in Traumatic Brain Injury (TBI) in children utilizing foundational learning experiences in sources of brain injury, various sequelae, interventions, educational modifications, IEP development, and resources for educators and families of children with TBI. Prereq: Admission to TBI Certification Program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6020 - Consultation and Leadership in TBI

This interdisciplinary course focuses on consultation, teamwork and leadership strategies needed for providing family-centered, culturally competent, community-based services for children with traumatic brain injury and other disabilities and their families. Prereq: Admission to TBI Certification Program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6040 - Applied Research in TBI for School Psychologists

This seminar focuses on the development of skills in conducting applied research with children and youth who have suffered a traumatic brain injury and addresses the need for school psychologists to develop and interpret research

designs used for applied research. Prereq: Admission to TBI Certification Program. Max hours: 3 Credits. **Semester Hours:** 1 to 3

SPSY 6100 - School Psychology: Professional and Legal Foundations

This course covers topics related to the practice of school psychology, both past and present, including legal/ethical obligations/issues, accreditation, certification/licensure, culturally competent practice, roles/responsibilities, and evaluation and accountability. Observation in schools and related settings is required. Prereq: Admission to School Psychology Program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6150 - Psychoeducational Assessment I

Focuses on assessment of cognitive ability, cognitive processes, and achievement in children and adolescents. Topics include selection, administration, and interpretation of ability and achievement tests; psychological report writing, and psychometric, historical, theoretical, and cultural issues in assessment. Test administration required. Prereq: RSEM 5300. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6160 - Psychoeducational Assessment II

Focuses on the assessment of adaptive behavior, personality, and social-emotional functioning in children and adolescents. Topics include selection, administration, and interpretation of these types of measures; cultural considerations in psychological assessment, psychological report writing, and developing interventions. Test administration required. Prereq: SPSY 6150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6170 - Assessment and Intervention: Birth to 3

Course familiarizes students with the provision of psychological services to children birth to 3 years. The course includes coverage of relevant federal/state mandates, typical and atypical development, multicultural issues, and family-centered and consultative psychological intervention services. Test administration required. Prereq: SPSY 6150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6350 - School-Based Interventions: Children, Youth and Families

Provides theoretical and practice-oriented introduction to child therapy in schools. Weaves together skills and techniques essential to theory and implementation of psychotherapeutic techniques. Course activities compliment the systemic and group-based interventions examined in SPSY 6400. Prereq: RSEM 5300 Introduction to Measurement, CPCE 5010 Counseling Theories, and permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6400 - School-Based Interventions: Groups, Classrooms and Systems

Provides students with advanced study of research on and techniques of classroom and small group interventions. Includes instruction on the evaluation of intervention effectiveness. Systemic, school-wide interventions are addressed. Prereq: RSEM 5100, RSEM 5300, SPSY 6350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6410 - Psychoeducational Assessment of Culturally and Linguistically Diverse Students

Prepares students to provide psychoeducational assessments to children who are culturally and/or linguistically diverse. Content includes differentiation of language disorders versus language acquisition, and developing recommendations for accommodations and interventions to meet the unique psychoeducational needs of diverse children and youth.

Prereq: SPSY 6150. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6420 - Crisis Prevention, Planning and Intervention

Introduces students to crisis theory, prevention research, and intervention strategies. The course is designed for school mental health professionals interested in developing advanced crisis counseling and intervention skills sufficient for use in school settings. The course emphasizes the importance of practical hands-on opportunities for skills development.

Prereq: SPSY 6350 and CPCE 5100 (or equivalent) and experience required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6450 - School-Based Consultation for Mental Health Professionals

A wide range of traditional or emerging consultation models emphasizing practical application of empirically-based approaches to advance the social or academic competence of students, classrooms, schools and districts. Hands-on experience supplement course content as students develop, refine, and practice their own eclectic consultation approach. Prereq: RSEM 5100, RSEM 5300 and SPSY 6350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6500 - Identifying and Planning for the Mental Health Needs of Children and Adolescents

Provides students with advanced concentrated study of the etiology, diagnostic criteria, recommend intervention strategies, and diagnostic procedures appropriate for the identification of children's mental health needs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 6550 - Academic Interventions in School Psychology

Provides training in knowledge and skills for the use of educational intervention practices in school psychology, including the development, implementation, and evaluation of academic interventions in the areas of reading, math, and written language; curriculum based measurement and progress monitoring. Prereq: SPSY 6150. Max hours: 3 Credits.

Semester Hours: 3 to 3

SPSY 6700 - Advanced Seminar in School Psychology

This course covers advanced topics related to the practice of school psychology including applying and interviewing for internship, certification/ licensure, capstone preparation and completion, and the development of a professional identity. Prereq: Prereq: SPSY 6911. Restriction: Restricted to School Psychology majors. Max hours: 3 Credits.

Semester Hours: 3 to 3

SPSY 6911 - School Psychology Practicum

Supervised practice in providing comprehensive psychological services to children in grades preschool to 12. Students are placed in public schools or affiliated school-related agencies and supervised by practicing, licensed school psychologists. Prereq: SPSY 5600, SPSY 6100, SPSY 6150, SPSY 6160 and consent of instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SPSY 6915 - Practicum with Culturally and Linguistically Diverse Students

This school psychology practicum experience is focused on developing multicultural competencies with culturally and linguistically diverse students through either a cultural immersion experience in Mexico or a local practicum placement in a culturally and linguistically diverse setting. Max hours: 9 Credits. **Semester Hours:** 3 to 3

SPSY 6917 - Advanced Practicum in Psychological Assessment

Under faculty supervision provide psychological assessment services to clients in the UC Denver Student and Community Counseling Center. Prereq: SPSY 6150, SPSY 6160, and consent of the instructor. Max hours: 1 Credit. **Semester Hours:** 1 to 1

SPSY 6918 - Clinical Externship

Clinical experience under supervision of licensed mental health professionals. Students participate in assessment and/or intervention in a variety of settings. Note: All field placements must be approved by the SPSY Program Director in advance of registration. Prereq: SPSY 6911. Max hours: 6 Credits. **Semester Hours:** 3 to 3

SPSY 6930 - School Psychology Internship

Supervised experience in the practice of school psychology with children and adolescents in a school or clinic setting. Prereq: SPSY 5900, SPSY 6410, SPSY 6911, SPSY 6200, SPSY 6350, SPSY 6400, SPSY 6450, SPSY 6500, SPED 5780 and instructor consent. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SPSY 6935 - Practicum in Evidence-Based Interventions: TBI

Practice implementing interventions with children and youth with a variety of behavioral, learning, and emotional problems related to traumatic brain injury. Includes special emphasis on identifying and implementing evidence-based interventions including the BrainSTARS curriculum and consultation methodology, under supervision. Prereq: Admission to BRI Certification Program. Max hours: 3 Credits. **Semester Hours:** 1 to 3

SPSY 7980 - Clinical Supervision & Admin of Psych Services

Course prepares school psychologists to function in supervisory and administrative capacities in delivering mental health services. Content includes examination of clinical supervision theories, models, techniques; focus on

development of skills for administrative roles, and understanding organizations from a systems perspective. Prereq: SPSY 6918. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SPSY 8980 - School Psychology Doctoral Capstone Project

The Capstone Project is a culminating component of the program. Production of a scholarly project that illustrates the student's understanding of relevant topics in school psychology, the scope of contemporary practice, and the various roles of the professional school psychologist. Prereq: SPSY 6911 and RSEM 7000. Max hours: 2 Credits. **Semester Hours:** 2 to 2

SSCI 4050 - Special Topics in Law Studies

These topics courses are concerned with specialized aspects of the study of law within the social sciences from various theoretical and research perspectives. These courses are interdisciplinary and serve as a forum for discussion specific to students interested in law studies. Max hours: 6 Credits. **Semester Hours:** 3 to 6

SSCI 4241 - Introduction to Legal Studies

A survey of the United States legal system, including lawmaking powers, jurisdiction, court procedures, professional ethics and major principles of business law, contracts, estates and probate, family law, property and torts. Cross-listed with HUMN 4251/HUMN 5251/SSCI 5251. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 4251 - Introduction to Legal Studies

A survey of the United States legal system, including lawmaking powers, jurisdiction, court procedures, professional ethics and major principles of business law, contracts, estates and probate, family law, property and torts. Cross-listed with HUMN 4251/HUMN 5251/SSCI 5251. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 4710 - Women and Religion

A sociological exploration of the contemporary roles of women in religion. Course examines American and world religious groups with an eye to women's involvement. Considers how women have changed these traditions as they take on leadership roles and discusses the tensions that arise within these traditions as a result of their expanded participation. Cross-listed with HUMN 5710, SSCI 5710, WGST 4710/5710, RLST 4710/5710. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 4840 - Independent Study

Directed study based on a specific subfield of social sciences. Max hours: 6 Credits. **Semester Hours:** 1 to 3

SSCI 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty

prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SSCI 5000 - 19th Century Philosophy

Covers the systematic work of such German idealists as Hegel, Fichte, and Shelling, as well as responses to those systems by such authors as Marx, Kierkegaard, and Nietzsche. Prereq: PHIL 3002 or 3022. Cross-listed with PHIL 4000/5000 and HUMN 5000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5010 - Problematizing Whiteness: Educating for Racial Justice

Critical Whiteness Studies provides a deeper analysis of race that accounts for both sides of the race coin: the plight of people of color AND how Whites are complicit. This class looks deeper into how race operates within White contexts and how that impacts people of color so we bridge how Whites AND people of color can work together towards a racially equitable society. Cross listed with ETST 4010, EDFN 4001, HUMN 5010 and EDFN 5001. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5013 - Philosophical Problems in the Social Sciences and Humanities

Presents an overview of key theoretical issues currently emerging across academic disciplines. Examines questions about reality, knowledge, ethics that affect social research and writing in the humanities. Readings explore how contemporary philosophical and cultural discourses have altered theory and method. Assignments include influential theoretical pieces by key historical and contemporary thinkers, examples of application in social research, and interpretations of thought and affect in cultural contexts. Cross-listed with HUMN/PHIL 5013. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5020 - Elements of Social Thought

Introduces students to the disciplines that comprise the social sciences (classical anthropology, sociology, sociology of religion, philosophy of history, political theory, classical psychology, etc.). Provides necessary tools for interdisciplinary students to understand the social infrastructure of contemporary society. Cross-listed with HUMN 5020 and PHIL 5020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5023 - Research Perspectives in Social Science

Introduces interdisciplinary social research through a critical examination of various methodological approaches. Each student formulates a research proposal which includes a research question, a review of the literature, and methods of study. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5025 - Methods & Texts of Interdisciplinary Humanities & Social Theory

Exposes the beginning graduate student to exemplary works and methodologies of disciplines oriented to humanities and social sciences, such as philosophy, sociology, history, communication, fine arts, and literature. Cross-listed with HUMN 5025. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5050 - Topics in Social Science

These topic seminars are concerned with specialized aspects of the social sciences from various theoretical and research perspectives. These courses are interdisciplinary and serve as a forum for discussion of individual projects and theses. Max hours: 3 Credits. **Semester Hours:** 1 to 3

SSCI 5101 - Pragmatism: Classical American Philosophy

The most significant philosophical tradition born in the United States is pragmatism. Examines several of the most important classical works of this tradition, the influence of thinkers who have helped pragmatism, and the contemporary relevance of this tradition. Figures who may be included in this course are: Emerson, Pierce, Royce, James, Dewey, Mead, Rorty. Prereq: An introductory course in philosophy. Cross-listed with PHIL 4101, 5101, HUMN 5101. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5242 - Bioethics

Examines some of the major moral issues confronting the nation's health care system. The class will search for solutions to such problems as financing health care for those unable to do so on their own, determining the extent of a patient's right to both refuse and demand certain types of medical treatment, and allocating scarce medical resources such as life-saving vital organs. The springboard for examining these issues will be the doctor or patient relationship framed by the moral principles of respect for persons and beneficence. Cross-listed with PHIL 4242, PHIL 5242, HUMN 5242. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5250 - Environmental Ethics

While human industry/technology creates enormous material prosperity, it can result in devastating environmental damage. This course analyzes the moral values, consequences and duties implied in relationships between human beings, animals and ecological systems, while seeking out new and ethical approaches. Cross-listed with PHIL 4250/5250 and HUMN 5250. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5251 - Introduction to Legal Studies

A survey of the United States legal system, including lawmaking powers, jurisdiction, court procedures, professional ethics and major principles of business law, contracts, estates and probate, family law, property and torts. Cross-listed with HUMN 4251/HUMN 5251/SSCI 4241. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5400 - Women and Violence

Analyzes the social, political, legal, and psychological aspects of violence against women and addresses: definitions of the problem, demographics, survivors, perpetrators, children who witness, bystanders, strategies and tactics of abuse and survival, along with strategies for prevention, intervention, treatment and social change. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5520 - The City Beautiful: Art, Architecture and Theory in Urban History

How did cities develop and what were the buildings that filled these spaces? Posing this question initially, this course takes a case-study approach to surveying the concerns confronting different cultures as they developed their urban environments sociologically, anthropologically, architecturally and spatially. Cross listed with HUMN 5520. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5530 - Social Construction of the Self

Investigates theories that address the construction of self and how that construction is constrained by culture, politics, society and historical moment. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5540 - Law, Diversity and Community in United States History

Engaging extensive primary and secondary source material, course applies an interdisciplinary approach to diversity and conflict that often surrounds the quest for economic, moral and social inclusion in the United States. Restricted to Graduate level students. Cross-listed with HUMN 5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5550 - Paris 1910: Art, Philosophy and Psychology

Traces the influences of philosophy, psychology, and art in the English, French, and German-speaking worlds in the early twentieth century. This intellectual history is extended to broader cultural and political contexts. Key period is between 1910 and 1968, when modernity's key aspirations and tensions became explicit. Cross-listed with HUMN 5550 and PHIL 5550. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5600 - Philosophy of Religion

Nature of religion and methods of studying it. Cross-listed with HUMN 5600, PHIL 4600, 5600, RLST 4060, and 5060. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5650 - Reflections on Modernity

Explores modernity as a historical epoch and a theoretical space, looking at the commentaries and reflections of influential 20th century thinkers including Adorno, Arendt, Levinas, Merleau-Ponty, Habermas and Foucault. Examines how the theoretical inclinations of modernity were influenced by politics, art, literature and culture. Cross-listed with HUMN 5650 and PHIL 5650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5710 - Women and Religion

A sociological exploration of the contemporary roles of women in religion. Course examines American and world religious groups with an eye to women's involvement. Considers how women have changed these traditions as they take on leadership roles and discusses the tensions that arise within these traditions as a result of their expanded participation. Cross-listed with HUMN 5710, SSCI 4710, WGST 4710/5710, RLST 4710/5710. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5720 - Sexuality, Gender and Their Visual Representation

Studies sexuality, gender and identity representation from classical antiquity through the present in the visual arts. Uses the literature of visibility, feminism, race and queer theory. Explores representations of femininity, masculinity and androgyny and their reinforcement and challenge to gender-identity norms. Cross-listed with HUMN 5720 and WGST 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5750 - Philosophical Psychology

Explores debates about psyche and body, mind and world, self and others, and consciousness and nature. Examines the philosophical questions related to those debates that arise within theories of perception, affect and cognition offered by influential psychological models. Cross-listed with HUMN 5750, PHIL 5755. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5770 - Imperialism, Post-Colonial Theory, Visual Discourse

Western empires disseminate political, social, economic & cultural practices through complex interplay of cultural practices. Visual production is a complex site for meaning making within imperialism. Examines how visual discourses operated to create meaning for audiences, through focus on postcolonial critique. Cross-list HUMN 5770. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5830 - Grant Writing for Nonprofits

Designed to help current and future professionals in the nonprofit sector understand the social, political, and economic context and mechanics of pursuing grants, government contracts, and other funding for nonprofit organizations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5833 - Existentialism

Examines one of the most influential movements in recent European thought, beginning with existentialism's 19th century roots, and continuing on to the existentialist philosophers of the 20th century. Figures covered may include Dostoyevsky, Kierkegaard, Nietzsche, Heidegger, Sartre and de Beauvoir. Cross-listed with PHIL 4833/5833 and HUMN 5833. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5840 - Independent Study: SSCI

Max hours: 9 Credits. **Semester Hours:** 1 to 3

SSCI 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

SSCI 5920 - Philosophy of Media and Technology

A philosophical examination of interrelationships between contemporary media, technology, and their impacts upon character of contemporary life and values. Topics may include ethics, epistemology, democracy, advertising, media literacy and criticism. Cross-listed with PHIL 4920, 5920, HUMN 5920. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5933 - Philosophy of Eros

What does it mean to understand philosophy as an erotic activity? This question will be examined, first by studying Plato's dialogues-such as Lysis, Symposium and Republic-and then by reading texts from Sigmund Freud, Michael Foucault and others. Cross-listed with PHIL 4933, WGST 4933/5933 and HUMN 5933. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 5939 - Internship

Max hours: 9 Credits. **Semester Hours:** 1 to 6

SSCI 6010 - Methods and Theories of Feminism and Gender Studies

Provides graduate-level interdisciplinary study in historiography, methodologies and theories of women's, gender and sexuality studies and considers how culture is constructed around these categories. Cross-listed with WGST 6010 and HUMN 6010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

SSCI 6950 - Master's Thesis

Max hours: 8 Credits. **Semester Hours:** 1 to 8

SSCI 6960 - Master's Project or Report

Research which may be based on field work. Max hours: 9 Credits. **Semester Hours:** 1 to 6

STME 4051 - STEM Capstone: Secondary Education

This course provides Secondary STEM Education students with a capstone learning experience that integrates knowledge of STEM content, students, and school context into socially-just and culturally responsive practices. Cross-listed with STME 5051. Max hours: 3 Credits. **Semester Hours:** 3 to 3

STME 5051 - STEM Capstone: Secondary Education

This course provides Secondary STEM Education students with a capstone learning experience that integrates knowledge of STEM content, students, and school context into socially-just and culturally responsive practices. Cross-listed with STME 4051. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 1100 - Introduction to Theatre, Film, and Television

An introduction to dramatic and cinematic texts, styles and productions; students will research and analyze a play and develop it into a film script. They will present their understanding by storyboards and multi-media presentations, exams and written work. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 1110 - Production Design: Theatre, Film and Video

This design research class explores the creative skills, technical knowledge and scholarly engagement employed by production designers. The students will understand how design elements enhance a production and create a production design for a video, film or play. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 1550 - Scriptwriting I

Each student conceptualizes, designs and creates short scripts for stage and screen. Instruction includes story development through first draft and rewrites, incorporation of critical feedback and the merger of image and idea to convey dramatic concepts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 3222 - Theatre, Film & Video Business

Students explore and evaluate business issues in film and theatre production such as finance, distribution, organization and legal issues through readings and projects. Students develop a solid business vocabulary and basis for work in these fields. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 3620 - Acting Styles

This course explores various topics in performance for stage and screen. Students will fully prepare scene studies using various methods and techniques in acting. Each semester will focus on one approach giving students an in-depth basis for their work. Max hours: 9 Credits. **Semester Hours:** 3 to 3

TFVP 3730 - Scenery Design

Introduces the principles and practices of production design for the theatre and film. Emphasizes textual analysis, the aesthetic and practical elements of design, design development and graphics. Requirements include related experiences working departmental productions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 3740 - Costume Design

Introduces the principles and practices of costume design for theater and film productions. Students will focus on basic figure drawing, practical elements of design, design development and different costume rendering techniques through projects and productions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 3820 - Production Process

Part two of two-course sequence. Students will increase their experience by applying production skills and theories learned in Intro to Production Process in a practicum setting to support theatre and film production activities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 3860 - Applications Seminar

Course work is reflection on the intellectual competencies, artistic capabilities, and skill sets gained throughout student's theatre & film studies. Students will create projects and write a significant paper on specified topics regarding entertainment industry opportunities, to assist their career advancement. Max hours: 3 Credits. **Semester Hours:** 1 to 3

TFVP 3910 - BA Junior Project

This course consists of structured work and independent work sessions assisting students with portfolio and career path. Students will be required to work on planning an event, either in theatre or film and produce professional portfolio for faculty review. Max hours: 1 Credit. **Semester Hours:** 1 to 1

TFVP 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Note: TFVP majors and minors only, or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 1 to 3

TFVP 4095 - Senior Thesis Project

The BFA thesis course involves the preparation, exhibition and critical faculty response to creative work and self-promotional materials as developed by graduating seniors on the BFA degree track. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 4560 - Directors at Work

Through creation and participation on a premiere production of a devised, media, and/or mixed media, performance work in collaboration with faculty and guest professional artists, directing students will sharpen the application of skills and learn aesthetics and structure. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 4570 - Directing Practicum

Directing Practicum is professional practice training through a mentored project-based assistantship with directors. During class students will be connected to and assist directors on film and theatre projects, working in small groups or one on one, to develop their skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

TFVP 4910 - BA Senior Project

This course consists of structured work and independent work sessions leading students to a portfolio and career path. Students will be required to research various career opportunities and produce a professional portfolio for faculty review. Max hours: 1 Credit. **Semester Hours:** 1 to 1

THTR 1000 - Visual Culture

Study academic theories surrounding visual cultures related to Film, Theatre & Video relating to topics such as representation, spectatorship, and mass media by viewing, research, and analyzing. Creative projects, readings, and written responses will increase sensitivity to visuals usage. Cross-listed with FITV 1000. Max hours: 3 Credits.

Semester Hours: 3 to 3

THTR 1001 - Introduction to Theatre & Arts in the Community

Discussion, workshops, and lectures designed to discover, analyze, and evaluate all aspects of the theatre experience: writing, acting, directing, staging, history, theory and its relationship to film & video. Attending plays and field trips to several Denver-area theaters, and demonstrations. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-AH1 **Semester Hours:** 3 to 3

THTR 1110 - Production Design: Theatre, Film and Video

This design research class explores the creative skills, technical knowledge and scholarly engagement employed by production designers. The students will understand how design elements enhance a production and create a production design for a video, film or play. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 1220 - Acting Skills Module I

This course is the study in vocal and physical techniques for skill development for the actor in various media which provides a foundation for continued study and performance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 1770 - Art Direction and Design Skills I

Students will study principles of theatre and film production design. They will do exercises in drawing, sketching, drafting, and rendering, with practical application towards theatre, film, and architectural design techniques. Upon completion, student will have a basic production design skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 1890 - Production Crafts I

Students introduced to practical applications of production tools stage equipment and construction vocabulary, through lectures and experiences in a variety of production settings. Students participate as crew members for both theatrical and film events thereby acquiring production skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 1891 - Production Crafts Lab

Students introduced to theoretical and practical applications of production tools, vocabulary, and experiences through working on projects and production crews in a variety of production settings. Students participate as crew members in lab for both theatrical and film events thereby acquiring production skills. Max hours: 4 Credits. **Semester Hours:** 1 to 1

THTR 1895 - Production Crafts II

Students introduced to practical applications of costume construction, design & vocabulary, through lectures and experiences in a variety of production settings. Students will construct, maintain, serve as crew members for both theatrical and film events thereby acquiring production skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2220 - Acting: Performance for Film, Theatre, and TV

Provides the study, skill development and workshop experience for the actor in various media – Including film, television, commercial and voice over work. Cross-listed with FITV 2220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2375 - Design and Decoration Survey

A survey of the history of visual decoration and ornamentation from ancient civilizations through to contemporary art. Subjects will include the study of textiles, motifs, ornamentation, architecture, and furniture and of the influences that shaped the history of visual decoration. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2380 - Costume History Survey

This course explores the history of Costume & Fashion from Ancient Greece through the present; includes an analysis of historical modes of production, and artistic creation in related cultures. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2400 - Technical Drawing for Production

Students will study principles of technical drawing through lectures and projects. They will do exercises in sketching, orthographic projection and drafting, with practical application towards theatre, film, and architectural design techniques. Upon completion, student will have skills in technical drawing methods. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2450 - Introduction to Performing Arts and Events Management

Offers students the ability to learn about stage managing events in the performing arts, in a non-pressure environment where leadership and organizational skills may develop and the student can gain a general understanding of the profession. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2510 - Introduction to Oral Interpretation

Students will have required readings in a variety of text styles. They will choose perform scenes from those texts introducing them to the basic performance skills required for Stage and Screen acting. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2531 - Acting for Non-Theatre Majors

Introductory acting course which focuses on the skills comprising the actor's art and their direct application to all disciplines of study outside of the theatre major. Students investigate interpersonal skills such as collaboration, communicating, risk-taking, listening, and creative problem solving. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2560 - Topics in Theatre

Specialized topics in theater. Max hours: 12 Credits. **Semester Hours:** 1 to 6

THTR 2600 - Studio I: Dynamics of Content Creation

Investigates the process of creating performance texts for live, recorded and mixed presentation as well as the methods of selecting, transforming and pacing material for performance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2710 - Theatrical Design, Aesthetics, Production I

Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2770 - Art Direction & Design Skills II

Students will study advanced presentation hand & computer techniques for through lectures and projects. They will develop skills in sketching, rendering, model building for theatre, film, and other designed environments (retail, rock concerts, worship, industrial productions, & restaurants). Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2820 - Departmental Production

Participation in departmental production. Max hours: 4 Credits. **Semester Hours:** 1 to 1

THTR 2821 - Multi-Arts Performance

Participation in an integrated arts performance piece. Credit hours are determined by a faculty advisor and are dependent on the level of responsibility in the production. Max hours: 3 Credits. **Semester Hours:** 2 to 3

THTR 2822 - Affiliated Theatre Production

Participation in a production at an affiliated theatre in the Denver metro area. Credit hours are determined by a faculty advisor and are dependent on the level of responsibility in the production. Max hours: 2 Credits. **Semester Hours:** 1 to 2

THTR 2823 - Theatre Buffs Production

Participation in a Theatre Buffs production. Credit hours are determined by a faculty advisor and are dependent on the level of responsibility in the production. Max hours: 2 Credits. **Semester Hours:** 1 to 2

THTR 2824 - Theatre Practice: Management

Practicum component of the theatre emphasis requirement through participation in stage management, box office management, or public relations for an approved production. Credit hours are determined by a faculty advisor and are dependent on level of responsibility in the production. Max hours: 4 Credits. **Semester Hours:** 2 to 4

THTR 2840 - Independent Study: THTR

Prereq: Written permission of the supervising instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

THTR 2890 - Production Crafts III

Students introduced to practical applications of prop construction, design & vocabulary, and scenic painting through work experiences in a variety of production settings. Students will construct, maintain, serve as crew members for both theatrical and film events, thereby acquiring production skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2895 - Production Crafts IV

Students are introduced to practical applications of lighting & sound design as well as installation practices & vocabulary, through work experiences in a variety of production settings. Students serve as crew members for events, thereby acquiring production skills. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 2900 - Dramatic Writing for Stage and Screen

Students will read, analyze and write short dramatic scripts for stage and screen. Students will write, present & rewrite, with special emphasis on the demands of production: space, acting, staging conventions and techniques. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3010 - Stage and Production Management

This is a course that addresses aspects of planning and managing various theatrical events and live performances. Emphasizes maximum results, given the complexity of live performance and the resource pool. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3115 - Critical Perspectives on Performance

Students explore performance with particular histories, commitments, and processes. and read and discuss historical, theoretical, and critical perspectives, as well as see performances. Will make use of these ideas and experiences in the process of developing own performance projects. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3300 - Studio I: Dynamics of Content Creation

Students investigate the process of creating performance texts for live, recorded and mixed presentation. Through lectures and studio work the class will explore the methods of selecting, researching, transforming and scoring images, text and material for performance. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3500 - Elements of Directing

Students explore the director's analytical process, interpretative production choices, and rehearsal techniques that are fundamental to the director's work in theater, film and video productions. By using hands-on learning environment with a primary focus on the interpretation and staging scripts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3520 - Acting/Directing Studio

This is a workshop course modeled on professional studios for Directors and Actors. Students study in vocal and physical techniques for skill development in a variety of scene work directed by members of the directing class. Prereq: THTR 2220. Coreq: THTR 3500 and 3610. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3530 - Acting: Character and Text

Fully prepared scene studies leading to advance work in characterization and text. Methods of discovering and utilizing the range of creative potential play scripts from the current production program are emphasized. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3531 - Theatre of Social Responsibility

Students study interactive theater based on selected social, political, or community concerns (peer pressure, gender identification and substance abuse). Students will create a performance piece on the selected topic. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3550 - World Theatre

Discussion, workshops and lectures designed to discover, analyze and evaluate the world theatre experience from countries outside of the United States. The course will explore theatre and its precedents in Asia, Africa, Eastern Europe and Latin America. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3560 - Topics in Theatre

Specialized topic in theater. Max hours: 9 Credits. **Semester Hours:** 1 to 3

THTR 3561 - Topics in Theatre: Honors in Humanities Cluster

Specific topics courses designed as cluster courses for the Honors in Humanities program. Titles rotate on a regular basis. Max hours: 9 Credits. **Semester Hours:** 1 to 3

THTR 3580 - Theatre for Children

Offered irregularly. Study of processes involved in creating substantial theatre for children, including an examination of various sources for dramatizing children's stories, fairy tales, poems, and existing scripts. Includes a full production of a children's play to be performed by members of the class before audiences of children. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3610 - Performance: Theory/History/Criticism I

Part one of two semester course sequence exploring questions of dramatic theory and dramaturgy in context of the development of Western Theater before 1850 and an analysis of historical modes of production, dramatic text and artistic creation in relation to contemporary theatrical practice. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3611 - Drama of Diversity

Investigates the creation and reinforcement of gender, ethnic, and racial stereotypes in theatre, film, and television in the United States. The course explores how popular images are created by writers, directors, and performers, and become "reality" for the audiences for which they are intended. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3620 - Performance: Theory/History/Criticism II

Performance: Theory/History/Criticism II: Part of 2 semester course sequence exploring Western theatre. Students will read plays, research documents from 1875 through the present and write papers on historical modes, production methods, dramatic theory of production, and dramatic text, in relation to contemporary theatrical practice. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3720 - Lighting Design

A practical introduction to the history, theory, practice and equipment for lighting performing arts productions. Course emphasizes textual analysis for lighting design, basic electricity, lighting equipment and control, safety practices and lighting graphics. Requirements include related experiences with departmental productions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3725 - Arts in Action

Students study interactive theater based on selected social, political, or community concerns & will use their skills to create a performance piece. Students use various sources for dramatizing stories and will tour the production. Requires out of class time for performances. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3735 - Career Creation

This course consists of work sessions assisting students with portfolio and career path. Students will be required to explore related careers, do interviews and activities, assess their strengths and interests and produce professional portfolios in several possible employment areas. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3760 - Sound Design for the Theater

Sound design with practical application towards usage in the theatrical discipline. Includes studio techniques, live playback, script analysis, and recording techniques. Students will learn the various applications through work on class projects and performances. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3765 - Digital Visualization for Production

Digital 2d and 3D techniques, vocabulary and processes used specifically in the creation, visualization and implementation of pre and post-production design elements for the Performing Arts. Hardware and software technology explicit to the disciplines will be covered. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3770 - Production Design Studio I

Students will study design & presentation using design projects. Using skills in sketching, rendering, and model building they will turn out 5 project designs for Scenery, or Lighting or Costume Design or retail, rock concerts, worship, industrial productions, & restaurants). Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3775 - Production Design Studio II

Students will design advanced projects. Using skills in sketching, rendering, and model building, they will turn out 2 complete projects, one each in their primary and secondary design (or tech areas). These projects overlap to mimic "real world design situations." Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 3840 - Independent Study: THTR

Prereq: Written permission of supervising instructor. Max hours: 6 Credits. **Semester Hours:** 1 to 3

THTR 3995 - Travel Study Topics

Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4090 - Senior Seminar & Project

A seminar integrating the development of four capstone projects (research, creative work, collaborative process and service/outreach) with a continuing forum focused on current issues in professional practice. Max hours: 3 Credits.

Semester Hours: 3 to 3

THTR 4200 - Capstone: Theatre Practice

A seminar integrating the development of a production utilizing the combined talents of the senior class. Major production positions both on and off stage will be filled by as many students as possible area. Max hours: 3 Credits.

Semester Hours: 3 to 3

THTR 4350 - Selected Studies in Theatre & Film

Course supplements the department's regular course offerings. Topics related to current productions and issues in Theatre or Film & community. Prereq: Must have 60 semester hours in THTR or permission of the instructor. Note: Open to both majors and non-majors. Can be taken more than once when topics vary. Max hours: 3 Credits. **Semester**

Hours: 3 to 3

THTR 4530 - Acting: Character and Media

Provides skill development and workshop experience for the actor in media work-film, television, and video. Students will analyze and present scene work in both live and media performances utilizing feedback from class and instructor.

Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4560 - Topics in Theater

Various special interest topics in the study of production, theory, and analysis with an emphasis on theater. Max hours: 9 Credits. **Semester Hours:** 1 to 3

THTR 4570 - Creative Drama

Offered irregularly. Study of creativity, its role and application in dramatics, and the manner in which creative dramatics assists in the growth and development of children and youth. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4580 - Theatre for Children

Offered irregularly. Study of the processes involved in creating designed and substantial theatre for children, including an examination of various sources for dramatizing children's stories, fairy tales, poems and existing scripts. Includes a full production of a children's play to be performed by members of the class before audiences of children. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4611 - American Theatre History

Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4730 - Advanced Scenic Design

Students will continue studies in graphic techniques, design styles and the integration of production design areas. Students will complete projects in scenic design for various production forms. Outcomes will include fully realized design projects with renderings, models and drafting. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4760 - Topics in Design

A special topics investigating production design in traditional and non-traditional endeavors. Students will explore various design skills through projects and participation in departmental productions. Attendance and review of productions will be scheduled. Max hours: 9 Credits. **Semester Hours:** 3 to 3

THTR 4770 - Advanced Production Design Studio

Students will design a portfolio piece, professional quality project to be used in their BFA jury. This course provides a "Paper project" in contrast to Senior Capstone Project class which could be a group project with a number of variables. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 4820 - Theatre Practice

Advanced practicum in production work for an approved production. Credit hours are determined by faculty advisor and are dependent on the level of responsibility in the production. Max hours: 4 Credits. **Semester Hours:** 1 to 4

THTR 4840 - Independent Study: THTR

Max hours: 12 Credits. **Semester Hours:** 1 to 3

THTR 5530 - Acting: Character and Media

Provides skill development and workshop experience for the actor in media work - film, television, and video. Students will analyze and present scene work in both live and media performances utilizing feedback from class and instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 5550 - Playwriting: The Short Form

Writing workshop in one-act plays, with special emphasis on the demands of production: space, acting, staging conventions and techniques. Students will write and revise several one act play scripts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 5560 - Topics in Theatre

Various special interest topics in the study of production, theory, and analysis with an emphasis on theater. Max hours: 9 Credits. **Semester Hours:** 1 to 3

THTR 5570 - Creative Drama

Offered irregularly. Study of creativity, its role and application in dramatics, and the manner in which creative dramatics assist in the growth and development of children and youth. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 5580 - Theatre for Children

Offered irregularly. Study of the processes involved in creating substantial theatre for children, including an examination of various sources for dramatizing children's stories, fairy tales, poems, and existing scripts. Includes a full production of a children's play to be performed by members of the class before audiences of children. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 5611 - American Theatre History

Offered irregularly. Investigates American theatres, methods of presentation, audiences, actors, acting, and economics from 1700 to the present, emphasizing contemporary practices and values as away of understanding and appreciating the place of theatre in this country as it has evolved and developed. Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 5840 - Independent Study: THTR

Max hours: 12 Credits. **Semester Hours:** 1 to 3

THTR 5939 - Internship

Max hours: 12 Credits. **Semester Hours:** 1 to 6

THTR 5995 - Travel Study

Max hours: 3 Credits. **Semester Hours:** 3 to 3

THTR 6840 - Independent Study: THTR

Max hours: 12 Credits. **Semester Hours:** 1 to 3

THTR 6950 - Master's Thesis

Max hours: 6 Credits. **Semester Hours:** 1 to 6

UNHL 1100 - The Life of the Mind

The UNHL program was developed with the goal of creating academics with leadership skills to communicate their ideas and strong leaders with the ability to think critically, analyze issues from alternate perspectives and develop and communicate plausible solutions that take into consideration all points of view; the ideal end result of the program would be intelligent, ethical leaders and scholars in multiple fields of endeavor. The three areas around which the course will revolve are: a) Oil, b) Robots, c) Penicillin. Each of these topics allows multiple facets of a university education in the old sense to be explored from philosophy, history and art to chemistry, physics and engineering. There will be multiple means of exploration for each of these topics, from lectures and in-class discussions to field trips and engagement activities; there will be writing assignments in every phase that will focus on writing skills and writing for different audiences. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 2755 - UHL Seminar

Max hours: 4 Credits. **Semester Hours:** 1 to 1

UNHL 2840 - Independent Study

Max hours: 12 Credits. **Semester Hours:** 1 to 6

UNHL 2850 - Faculty-Mentored Research

UNHL student research conducted under the supervision of UC Denver faculty. Prereq: Permission of sponsoring faculty mentor and UNHL Director. Max hours: 6 Credits. **Semester Hours:** 1 to 6

UNHL 2939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Cumulative GPA of 3.0 or above and permission of UNHL Director/Associate Director. Max hours: 3 Credits. **Semester Hours:** 1 to 3

UNHL 3010 - Leadership Behavior: Historical and Contemporary Perspectives

This course will provide students with an opportunity to integrate historical and contemporary issues in the study of leadership behavior. The course is based on leadership research and writing that reveals the leader as facilitator, collaborator, servant, and follower. The course will provide students with an opportunity to reflect, discuss, and write on topics and questions related to leadership and followership behavior. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3100 - Ethics & Leadership: An Introduction

This one-semester ethics and leadership course will introduce students to the wide variety of some of the best

leadership theories and their application to current ethical issues. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3110 - Leadership, Communication, and Conflict

Leaders spend a significant amount of time managing conflict. This course is designed to explore the practical and theoretical basis of conflict and communication, and seeks to examine critical leadership processes that lead to the increased likelihood of organizational survival through successful conflict management. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3150 - Negotiation, Bargaining, and Leadership

This course integrates leadership theory and practice within a principled negotiation philosophy. Students will develop lifelong negotiation skills that reflect a principled negotiation framework for conflict management and strategic bargaining. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3250 - Leadership and Sustainability

This course examines issues of sustainability and the leadership challenges associated with the creation of sustainable social structures. Topics covered include a wide range of sustainability concerns such as: global population and food scarcity, alternative fuels and energy systems, biological and human health, leadership and sustainability program development, and symbolic and media representations of sustainability. Prereq: UNHL 1100 and second- or third-year status in the UNHL program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3310 - Innovation, Cutting-Edge Knowledge, and Self-Guided Learning

The purpose of this course is to familiarize students with cutting-edge knowledge in major scientific and technological fields, against the background of cultural and artistic creativity, and to establish habits of lifelong, self-guided learning. To enhance this process, relevant faculty will be invited to speak about innovation in their field, both in class and during the planned panel discussion. Prereq: UNHL 1100 and second- or third-year status in the UNHL program. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3501 - Love and Death in the Greek Classics

This course introduces students to classical Greek literature, focusing on love and death in Homeric epic, lyric poetry, tragic drama, the history and social science of Thucydides, the comedies of Aristophanes, and Plato's philosophical dialogues. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3503 - Ethics, Academic Integrity, and Social Responsibility

This course combines research and class discussions in such a way that theories, viewpoints, and practical proposals regarding ethics and its application to intellectual responsibility are understood in their own right as well as in relation to other human activities. One daunting task will be facing up to the challenge of how to use the increasingly powerful information tools provided by universities. In the last third of the semester, students will be asked to work in teams on

projects dealing with current ethics controversies. Prereq: UNHL 1100; not open to students who have taken UNHL 3100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3520 - Ancient Human Environmental Impacts

This course is an exploration of the history of human engagement with their environment, focusing specifically on what ecological and archaeological data can tell us and how to best collect and conceptualize them. It will introduce students to key concepts in past human ecology to establish humanity's place in nature as well as examine a series of targeted case studies in order to trace how these relationships between humans and their ecosystems may have changed in scale and nature over time and in different contexts. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3610 - Neuroscience and Society

Science has provided tantalizing glimpses into the nature of humans and the groups in which they live. This course will explore these matters in a way that encourages critical analysis of the relationship between our brains and the world. In the process, we will focus on the scientific method itself and its standing in relation to faith, ideology, and sociopolitical attitudes. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3620 - Migration, Modernity, and Literacy

An examination of the causes, consequences, difficulties, and enduring problems of migration in contemporary global society. Political, legal, and educational problems of modernity and mass migration are analyzed. Course work includes social scientific research into historical and contemporary migration flows. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3625 - Food Justice: Urban Agriculture, Place, and Culture

Addresses systemic inequities in access to fresh and healthy food as illustrated by neighborhoods termed "Food deserts." Questions examined include how sustainable/ethical relationships can be established between growing food and creating community, developing consciousness of place, and affirming cultural food/agricultural traditions. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3810 - Understanding and Dealing with Uncertainty

This course discusses the concept of uncertainty from multiple perspectives. What is uncertainty? How does it relate to other notions such as ignorance or variation of risk? How do we deal with uncertainty? We will consider ideas from mathematics, science, philosophy, religion, law, and psychology, among other fields. Students will be required to develop their own ideas on uncertainty in written form and/or participate in group presentations. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3820 - The Economics of Life

Study of the economic approach to human behavior and its application to the analysis of markets and areas including politics, law, family life, and other social issues. Students will develop an understanding of how the economic approach

differs from other approaches to analyzing these phenomena and for the possibilities and limitations of the economic approach. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3825 - Irish Music, Peace, Politics, and Popular Culture

This course explores traditional and contemporary music in Ireland, examines Irish politics and the peace process in the Republic and Northern Ireland, and considers ways in which various forms of Irish popular culture have represented Irishness and Irish identity. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3830 - Jazz in American Culture

This class will explore the influence of jazz music (and related forms like ragtime and the blues) on American culture more generally. Specific topics to be explored include the Post-Reconstruction Race Politics, the Delta and the Great Migration, New Orleans, and the Harlem renaissance. Important figures of African-American literature, and Jazz & the Blues music will also be presented. Students will examine a multitude of literary and musical experiences through novels, short works, biographies, and listening. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3832 - Theater Practices, Politics, and Social Justice

This class will emphasize performance techniques from master theatre practitioners, as they illuminate the relevance of theatre both as a form of artistic expression and a vehicle for social change. Students will read major dramatic works, attend plays and create original performances exploring issues of political and social concern. Restriction: Restricted to students in the University Honors and Leaders Program (UNHL). Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3840 - Creativity and Social Change

This course draws on historical cases and contemporary movements to examine the ways human creativity - broadly situated across artistic, scientific, and social activities - can foster social change. Restriction: Restricted to students in the University Honors and Leaders Program (UNHL). Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3910 - Ideology and Revolution

Was ideology invented in the 19th Century? Conservatism, Liberalism, Nationalism and Socialism were all invented in the short span of 1789 - 1870. In this course we read works of Edmund Burke, Karl Marx, J.S. Mill, and others who reacted to the French and Industrial Revolutions, hoping to repair the social fabric. Prereq: UNHL 1100. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 3939 - Internship

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prereq: Cumulative GPA of 3.0 or above and permission of UNHL Director/Associate Director. Max hours: 3 Credits. **Semester Hours:** 1 to 3

UNHL 3995 - Global Study

UNHL Academic Honors track and Leadership Studies track. Travel study, with location and topics to be selected by the instructor. Prereq: UNHL 1100, 2755, and permission of the UNHL Director. Max hours: 12 Credits. **Semester Hours:** 1 to 4

UNHL 4815 - The Science of Food

This course will introduce students to the science of food and how it relates to health, the human body, and manifestation of chronic disease (cancer, diabetes, and cardiovascular disease). Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 4820 - Scientific Thinking

Intensive analysis of primary literature from across the sciences. Students will expand their understanding and appreciation of the scientific method and develop the ability to critically analyze and evaluate experimental design in both scientific and social contexts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 4825 - Nuclear Technology: Dilemmas & Policies of Science

From promise to devastation, nuclear technology highlights the modern dilemma of how to manage our prodigious knowledge of science with our limited understanding of human decision-making. Begins with basic nuclear chemistry and moves to the political history of our nuclear age, prompting discussions ranging from physics to metaphysics. Max hours: 3 Credits. **Semester Hours:** 3 to 3

UNHL 4840 - Independent Study

Max hours: 12 Credits. **Semester Hours:** 1 to 6

UNHL 4850 - Faculty-Mentored Research

UNHL student research conducted under the supervision of UC Denver faculty. Prereq: Permission of sponsoring faculty mentor and UNHL Director. Max hours: 6 Credits. **Semester Hours:** 1 to 6

UNHL 4991 - Senior Research Seminar I

Capstone experience for UNHL program. Students will work in teams on research projects of a multidisciplinary nature. Prereq: Fourth-year standing in the UNHL program or permission of the UNHL Director. Max hours: 2 Credits. **Semester Hours:** 2 to 2

UNHL 4992 - Senior Research Seminar II

Continuation of UNHL 4991. Students will work in teams on research projects of a multidisciplinary nature. Prereq:

Fourth-year standing in the UNHL program or permission of the UNHL Director. Max hours: 2 Credits. **Semester Hours:** 2 to 2

URBN 6610 - Design Studio I

Working at the urban/metropolitan scale, this studio introduces design through urban structure and morphology, presenting the city as a complex ecological organism comprised of interrelated systems. Max hours: 12 Credits. **Semester Hours:** 6 to 6

URBN 6611 - Design Studio II

Advances understanding and application of urban design tools, methods and practice. Studio emphasizes designer's proactive role in shaping design using regulations and policy. Students consider real estate development, economics, aesthetic criteria, historic preservation, and methods of effective community participation. Max hours: 12 Credits. **Semester Hours:** 6 to 6

URBN 6612 - International Design Studio

Immerses students in international location(s) to engage urban design in other cultures. Studio operates within network of professionals involved in contemporary urbanization projects. Focus on complexities of international practice. Students develop complete project and consider context, politics, economics and regulation. Max hours: 6 Credits. **Semester Hours:** 6 to 6

URBN 6633 - Form and Formation of Cities

This course investigates the origins and types of human settlements; the history of cities and urbanization; urban morphology and the evolution of the built environment; urban form principles and theory; and types of urbanism. Cross-listed with URPL 6350. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6640 - History of the City

Introduces students to the history of global cities through selected typologies. Explores similarities and differences among cities considered against the larger cultural, political and socio-economic envelope of which they are part. Provides awareness of origins, growth and evolution of urban form. Cross-listed with ARCH 6240. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6641 - Design Process

Advances current practice by exploring innovative methods of design analysis, production, representation, and communication. Community participation and civic engagement are integral components of seminar. Cross-listed with URPL 6398. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6642 - Design Policy

Argues that a role of urban designers is to shape built environment through combination of physical intervention and policy development. Students review urban economic and real estate trends and assess zoning/land use regulations to understand impacts on built environment quality. Cross-listed with URPL 6397. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6643 - Graphics for Planners

Professional planners must be able to communicate their design concepts through graphical means. Students will learn to communicate with use of hand and technical drawings, color renderings, computer modeling and graphic layout design. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6644 - Sustainable Urbanism

This seminar explores the connections between ecology and urbanism. It will examine the multiple, interrelated ecological and social systems operating in the city. Students will explore innovative design processes and techniques that serve to create a higher quality of life and place with a particular emphasis on the effectiveness of sustainable design approaches at varying scales. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6645 - Global Design Practice

This seminar will educate students about critical issues related to practicing design in a global context. Course will examine diverse issues of design and planning practice from contracts, communication and culture to remote research, design opportunities and ethics. Prereq: URBN 6612. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6651 - Design Practice

Introduces students to the business of urban design through contact with prominent and innovative urban design professionals. Examines issues of design implementation; project management; communication, negotiation and facilitation; leadership; and finance. Restrictions: Restricted to ARUR-MUD majors in the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6652 - Design Seminar

Investigates topical issues in urban design, typically within the framework of a theme running through an entire course of study. Focus is on critical evaluation of theory, process and methods. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URBN 6686 - Special Topics: Urban Design

Various topical concerns are offered in urban design history, theory, elements, concepts, methods, implementation strategies, and other related areas. Max hours: 9 Credits. **Semester Hours:** 1 to 6

URBN 6730 - International Studies Preparation

The course will prepare students to go to China, for 10-day International Summer School, 5-week China Summer Urban Design Joint Studio, 9-month Gensler Internship, and 1-year LA Dual Degree program. Topics include historic, geographic and cultural issues, and language lessons. Cross-listed with ARCH 6730, LDAR 6730, and URPL 6730. Max hours: 3 Credits. **Semester Hours:** 1 to 3

URBN 6840 - Independent Study: URBN

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to urban design. Max hours: 3 Credits. **Semester Hours:** 1 to 3

URBN 6930 - Urban Design Internship

Designed to provide professional practice experience in urban design. Emphasis on actual work experience in settings with client groups as students assist them in determining solutions. Program directors approval required. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5000 - Planning History and Theory

This course offers a comprehensive review of the major historical and theoretical developments in planning; the human aspects of planning as a social, political, and community-oriented process; public engagement; social justice; planning leadership and advocacy; and the future of planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5010 - Planning Methods

This course focuses on the most commonly applied quantitative and qualitative methods used in planning; data organization and management principles; and various ways to collect, analyze, and communicate data as a fundamental component of the planning process. Cross-listed with GEOG 4000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5020 - Planning Law and Institutions

This course covers the legal basis for planning; the evolution of planning law through a comprehensive review of landmark court decisions; and the types and hierarchies of governments, their powers and relationships, and how planning operates within those governmental contexts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5030 - The Planning Profession

This course offers a comprehensive survey of the breadth and depth of the planning profession; different types of planners and the organizations that employ them; business aspects of planning; planning solicitation process; planning ethics; and professional/career development in planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5040 - Urban Sustainability

Examines the interface of the natural and social realms in cities. Topics include the environmental history of cities; the causes, environmental impacts and mitigation of sprawl; urban green infrastructure; and best practices in planning environmentally sustainable cities and suburbs. Cross-listed with GEOG 4000. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5050 - Urban Development

Explores the procedures, policies and politics of planning and real estate development. Topics include the relationship between planning goals and regulations; real estate development and finance; land division, entitlement, and regulation; site planning and development review; and public infrastructure. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 5060 - Planning Workshop

An introduction to the studio environment, this course provides students with experience and knowledge/skills development in physical planning and design, the planning process, plan making, and collaborative planning, plus introductory instruction in GIS, Adobe Creative Suite, and Google SketchUp. Max hours: 6 Credits. **Semester Hours:** 6 to 6

URPL 6000 - Planning Project Studio

This studio course requires student teams to complete a substantial planning project using a comprehensive set of knowledge/skills for real-world clients. Five focus area options offered annually: Healthy Communities, Urban Revitalization, Regional Sustainability, International Experience, and Summer in Colorado. Prereq: URPL 5060 or 6630. Max hours: 6 Credits. **Semester Hours:** 6 to 6

URPL 6200 - Land Development Regulations

This course provides a comprehensive exploration of the various components of land development regulation, including preliminary plats; general/final development plans; zoning; PUDs; variances; site plan/development review; land use regulators; regulatory processes. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6205 - Plan Making

This course offers a broad overview of the various types of plans and the specific processes involved in their creation, including comprehensive plans; rural/small town plans; corridor plans; small area plans; campus/ institutional plans; special plans. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6210 - Planning Communication

This course focuses on communication best practices through various media and for different planning audiences and contexts including public engagement and meeting facilitation. Students will be given multiple opportunities to hone their written, verbal, and graphic communication skills. Restriction: Restricted to Graduate Urban and Regional Planning students. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6215 - Analyzing the Built Environment

This course explores various means and techniques used to analyze and characterize the built environment, including land division and development measures; urban morphology; and analyzing the spatial attributes of cities and regions at varying scales and perspectives. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6220 - Advanced Research Techniques

This course offers an in-depth look at a variety of research principles and techniques, including advanced qualitative and quantitative data collection; survey design; sampling; probability distributions; hypothesis testing; inferential statistics; other topics associated with scholarly research. Prereq: URPL 5040 or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6249 - Project Management

Introduces the knowledge and skills of Project Management (PM) in a business environment. Emphasis will be on the entire project life cycle, the project management process groups and the knowledge areas as presented in the Project Management Body of Knowledge (PMBOK) from the Project Management Institute (PMI). Managerial aspects, quantitative tools, and traditional techniques of Project Management will be covered. A variety of projects will be examined. Note: Cannot receive credit for both DSCI 6820 and BUSN 6820. Cross-listed with BANA 6650. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6250 - GIS Analysis

This course expands beyond the fundamentals of Geographic Information Systems to offer intensive instruction in GIS analysis and cartography; advanced GIS applications and tools; GIS integration with other applications and technologies; innovations in geo-spatial data collection, analysis, and presentation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6255 - Emerging Planning Technologies

This course explores the rapid pace of innovation in planning-related technologies and offers a comprehensive review of the latest web-based and mobile applications, and new technologies used in virtual participation/engagement, data collection/visualization, social media/crowdsourcing, and geo-spatial data collection and analysis. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6260 - Advanced Geo-Spatial Methods

Advanced techniques in geographic information systems, including interpolation and geostatistics, 3D rendering, terrain and viewshed analysis, spatial autocorrelation detection, site selection and prioritization, model building and automation, geodatabase design, network analysis, hydrology and watershed analysis, and public data integration. Prereq: An introductory GIS class is required before taking this class. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6300 - Planning Healthy Communities

A place-based approach to understanding the social, economic, environmental, and political factors that influence individual and community health, and health disparities. Covers policies, practices, data, and methods for healthy communities planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6305 - Healthy Community Assessments

This course focuses on defining, organizing, and conducting Health Impact Assessments, health measures, policies, best practices, and other types of studies and analyses related to the link between the built environment, public health, and healthy communities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6310 - Community Food System Planning

Healthy communities require sustainable local and regional food systems. This course examines how communities can collaboratively develop and implement programs, processes and practices that help ensure food security and equitable access to healthy food options for all populations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6349 - Global Health Studies II

Global Health Studies II: Comparative Health Systems. The course has three parts: (1) examines the social and cultural construction of sickness, systems of etiology cross culturally, the therapeutic encounter, varying roles of healer and patient, and the cultural basis of all healing systems; (2) considers health systems in the context of global health reform, and the history, organization, and roles of institutions of global health governance; and (3) considers the interrelationship of health, foreign policy and global security. Cross-listed with PBHL 4020. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6350 - Form and Formation of Cities

This course investigates the origins and types of human settlements; the history of cities and urbanization; urban morphology and the evolution of the built environment; urban form principles and theory; and types of urbanism. Cross-listed with URBN 6633. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6355 - Urban Redevelopment Strategies

This course focuses on the best practices and strategies used to help revitalize urban areas. Topics include urban infill development; TODs; adaptive reuse; historic preservation; design review; parking; public spaces; brownfield/grayfield redevelopment; culture/tourism; special districts; incentives/funding; and revitalization policies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6360 - Urban Infrastructure

This course provides a comprehensive exploration of transit planning, including transit planning fundamentals; transit routes and systems; transit modes and technologies; ridership modeling; scheduling; operations; funding; policies and regulation; relationship to land use; and facilities/design requirements. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6365 - Parks and Public Spaces

This course offers a focused look at the role of parks and public spaces in the development and activation of cities; their designs, qualities, and components; management /operations; funding; policies; equal access; role as community and economic development tool. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6370 - Sprawl and Growth Management

This course addresses causes of sprawl (large lot zoning, highway subsidies, suburban amenities, taxes and municipal services), social and environmental consequences of sprawl, anti-sprawl growth management policies, open space preservation methods, and retrofitting suburbs. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6397 - Design Policy/Regulation

Argues that a role of urban designers is to shape built environment through combination of physical intervention and policy development. Students review urban economic and real estate trends and assess zoning/land use regulations to understand impacts on built environment quality. Cross-listed with URBN 6642. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6398 - Design Process

Advances current practice by exploring innovative methods of design analysis, production, representation, and communication. Community participation and civic engagement are integral components of seminar. Cross-listed with URBN 6641. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6399 - Introduction to Sustainable Urban Infrastructure

Focuses on developing uniform vocabulary on sustainable infrastructure across science & technology, architecture & planning, public policy, and health & behavioral sciences. Students learn concepts, principles/pathways and evaluation techniques for promoting the diffusion of sustainable urban infrastructures. Cross-listed with CVEN 5460. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6400 - Community Development

This course introduces community development, examining planners' and other stakeholders' roles in the field; key theories and practices; community dynamics; community-based organizations; asset-based development; social equity; and the influence of local physical and economic factors on community development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6405 - Urban Housing

This course examines housing trends and patterns; supply and demand factors; housing policies; housing challenges (e.g., inequitable distribution, special needs, segregation/discrimination, and homelessness); sociological, demographic,

and economic considerations; and the roles of planners and the public and private sectors. Cross-listed with LDAR 6755 and ARCH 6205. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6410 - Social Justice in Planning

This course investigates various social justice issues encountered in planning, including conflict resolution; advocacy; environmental justice; social equity; culture and diversity; disadvantaged populations; public engagement techniques; affordability; equal access; and policy impacts. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6449 - Urban Social Problems

Examines local government from the perspective of sociology and group dynamics. Course could include some or all of the following subjects: neighborhoods and community groups, class and race relations, community crime, social service issues, immigration, the underclass in American society, and related urban social problems. Cross-listed with PUAD 5628 and 7628. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6450 - Urban Economic Systems

This course offers an exploration into urban economic systems; local economies; urban economic development; urban market assessment; local job generation; local scenario planning; local taxes/spending; and urban fiscal/economic policies and impacts at the neighborhood and city scale. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6455 - Real Estate Development and Finance

The course offers a detailed analysis of the real estate development process, its relationship to the planning/design profession, and financial aspects of real estate development including measures of value, capitalization rates, capital budgeting, debt and equity markets and taxation. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6460 - Green Real Estate Development

This course offers an exploration into the principles, designs, policies, and best practices relating to sustainable real estate development. Topics include infill development; transit-oriented development; LEED-ND; green buildings; universal design; mixed-income projects; and net-zero developments, among others. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6499 - Preservation Theory and Practice

Philosophical questions in preservation practice; balancing significance in the environment with natural decay and demands for change. Policy issues as well as preservation and adaptation design. Cross-listed with HIPR 6010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6500 - Environmental Planning/Management

This course addresses issues related to planning under major environmental laws, ecosystem service-based management, urban green infrastructure, urban watershed and river management, urban forest and parks planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6505 - Enviro. Policy & Regulation

This course focuses on the important field of environmental policy and regulation, including topics such as the National Environmental Policy Act (NEPA); environmental justice; environmental law; land use conflicts; contamination/remediation; environmental regulators; and regulatory policies and enforcement. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6510 - Energy/Natural Res. Planning

This course provides an overview of the issues associated with energy and natural resource planning. Topics include: energy policy; alternative energy development; water resources; extraction/mining; natural resource protection and regulation; resource management, policies, politics, and technologies. Cross-listed with GEOG 4260. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6515 - Sustainable Planning & Design

This course takes a comprehensive look at the principles of sustainable planning and design. Topics include: sustainability defined; measuring sustainability; sustainable planning/practices; sustainable design; LEED and other sustainability programs and organizations; environmental quality; sustainability advocacy. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6548 - Defining & Measuring Sustainability

Unique cross-disciplinary course that teaches students community engagement strategies to define sustainability goals. Life cycle assessment and material flow analysis tools used to measure environmental sustainability benchmarks. Fieldwork applies both tools to cities in Colorado. Cross-listed with CVEN 5461. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6549 - Environmental Impact Assessment

The objective of this course is to provide the foundation for understanding the environmental impact assessment process, its legal context, and the criteria and methods for procedural and substantive compliance. Prereq: URPL 5530 or permission of instructor. Cross-listed with GEOG 4220, 5220. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6550 - Transportation Planning/Policy

This course examines policy issues in urban transportation planning: how transportation system design and political/institutional contexts shape transportation decision-making; major modes of urban transportation; and the social, environmental, economic, energy, and health impacts of transportation systems. Cross-listed with GEOG 4670. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6555 - Transportation and Land Use

Examines basic concepts/methods in contemporary land use and transportation planning, including travel demand forecasting, traffic impact analysis, travel behavior, active transportation; and examples of transportation/land use interaction such as the influence of built environments on travel and transit-oriented development. Cross-listed with GEOG 4630. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6560 - Transit Planning

This course provides a comprehensive exploration of transit planning, including transit planning fundamentals; transit routes and systems; transit modes and technologies; ridership modeling; scheduling; operations; funding; policies and regulation; relationship to land use; and facilities/design requirements. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6565 - Pedestrian & Bicycle Planning

This course provides a detailed focus on the unique planning issues and factors involved with bicycle and pedestrian modes of transportation, including pedestrian/bicycle planning fundamentals; routes and systems; facilities and design requirements; funding; maintenance and operations; policies; and best practices. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6600 - Regional Planning and Economic Analysis

Provides an overview of public processes and institutions for planning housing, transportation, infrastructure and jobs at a regional scale, as well as analytic techniques to study worker and commodity flows, industrial clusters, commuting patterns, and other data regarding regional economies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6605 - Regional Economic Systems

This course offers a comprehensive investigation into regional economic systems; metropolitan economies; regional economic development; regional market assessment; job generation; taxes/spending; and fiscal/economic policies and impacts at the metropolitan, regional, and statewide scale. Cross-listed with GEOG 4400. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6610 - Planning Sustainable Suburbs

This course takes a detailed look at the unique characteristics, issues, and challenges associated with planning and retrofitting automobile-oriented suburban communities and the opportunities for development of new communities using sustainable planning and design principles. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6615 - Small Town, Rural, and Resort Planning

This course investigates the unique characteristics, issues, and challenges associated with planning in small and/or rural

communities, including agricultural issues and farmland conservation; growth management; rural economic development; and small downtown revitalization strategies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6620 - Tourism and Resort Planning

This course investigates the unique aspects associated with planning and developing sustainable tourism infrastructure. Topics include: eco-tourism; historic tourism; cultural tourism; urban tourism; sports and recreation planning; regional tourism planning; and sustainable resort planning and development. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6625 - Sustainable Planning for Tourism and Small Towns

This course is about sustainably planning for tourism-dependent communities, particularly small towns. It focuses on the impacts of tourism on fragile cultural and ecological environments and addresses how to assess impacts, mitigation approaches and tools, and communication with the public. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6645 - Disaster/ClimateChangePlanning

Introduces students to concepts and debates that shape disaster and climate change studies. Features case studies of disaster and climatic issues affecting Colorado and the Rocky Mountain region. Looks specifically at how planning can reduce risk and increase local resilience. **Semester Hours:** 3 to 3

URPL 6650 - Planning in the Dev. World

This course explores the issues involved in planning in the developing world; challenges and solutions for complex development; health/community issues; social justice; cultural/technological issues; environmental justice; funding; infrastructure development; international development organizations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6655 - Comparative International Planning

This course investigates the global dimensions of planning, including a survey of global planning issues; a comparative analysis of planning philosophies, policies, techniques and approaches used throughout the world; and international planning coordination and organizations. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6675 - International Field Research: Methods and Analysis

This course will teach students the fundamentals of data collection, analysis, and dissemination in an international - and mostly developing world - context. Restriction: Restricted to graduate students within the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6730 - International Studies Preparation

The course will prepare students to go to China, for 10-day International Summer School, 5-week China Summer Urban Design Joint Studio, 9-month Gensler Internship, and 1-year LA Dual Degree program. Topics include historic,

geographic and cultural issues, and language lessons. Cross-listed with ARCH 6730, LDAR 6730, and URBN 6730. Max hours: 3 Credits. **Semester Hours:** 1 to 3

URPL 6800 - Special Topics: Urban and Regional Planning

Various topical concerns are offered in urban and regional planning, theory, concepts, methods, case studies and practice. Max hours: 9 Credits. **Semester Hours:** 3 to 3

URPL 6805 - Planning Internship

Designed to provide professional practice experience in urban and regional planning. The emphasis is on actual work experience in settings with client groups as the students assist them in determining solutions to their problems. Max hours: 6 Credits. **Semester Hours:** 3 to 3

URPL 6810 - Independent Study: URPL

Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to urban and regional planning. Max hours: 6 Credits. **Semester Hours:** 1 to 3

URPL 6850 - ACE Mentoring

Graduate students work with professional architects, designers, and engineers mentoring students in selected local high schools to learn problem solving, graphics and model making to produce a design project. Student mentors develop lesson plans, outcomes and keep a weekly journal. Cross-listed with ARCH 6470 and LDAR 6470. Restriction: Restricted to majors within the College of Architecture and Planning. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6900 - Planning Capstone

Planning Capstone A requires students to identify an independent study/small group project of their choosing and develop a detailed plan to complete the project. Prereq: URPL 6000 or instructor consent. Max hours: 6 Credits. **Semester Hours:** 6 to 6

URPL 6920 - Planning Thesis A

Spanning two semesters, Planning Thesis requires students to plan and complete a research thesis of their choice. Part A provides instruction for proper thesis research, analysis, and writing while students develop a detailed work plan and begin their research. Max hours: 3 Credits. **Semester Hours:** 3 to 3

URPL 6925 - Planning Thesis B

Spanning two semesters, Planning Thesis requires students to plan and complete a research thesis of their choice. Part B includes the completion of the research and the thesis document, and presentation of the project to the student's thesis committee. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 1050 - Introduction to Women's and Gender Studies

This course provides an introduction to key concepts, themes and approaches to the interdisciplinary field of women's and gender studies. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 1111 - Freshman Seminar

Restriction: Restricted to Freshman level students. Max hours: 3 Credits. **Semester Hours:** 1 to 3

WGST 2900 - Smart Girl Leadership Training and Practicum

Provides leadership and mentoring training, and a practicum in which UCD students mentor teenagers in their community or school settings. Following completion of the training, students work as near-peer mentors and coaches with groups of teenage girls in the Denver community and apply the skills learned in their training. Max hours: 6 Credits. **Semester Hours:** 3 to 3

WGST 3010 - Sociology of Human Sexuality

Increases the understanding of differences in views of sexuality, specifically the link between sex and reproduction and its role as the motivation for gender roles and sex acts. Explores the history of sexuality, cross-cultural studies and primate modeling. Cross-listed with SOCY 3010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 3020 - Gender, Sexuality and Race in American Popular Culture

This course explores the impact of popular culture on the lived experience of diverse women and men in America. Students will examine how cultural media (including film, television, print ads, music & digital games) can both reproduce and challenge existing structural inequalities. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 3080 - Sex and Gender

Causes and consequences of sex role differentiation at the individual, group and societal levels. Current issues related to changing norms and values concerning gender in modern society are examined. Cross-listed with SOCY 3080. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 3343 - Women in U.S. History

An analysis of women's place in society, in the work place, and in the political arena over the last 300 years. Cross-listed with HIST 3343. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 3450 - Twentieth Century Women Writers

Examines how women write about a specific theme, such as home, work, family, the "other," as well as how women's

writing may differ from men's. Theme and genre vary. Cross-listed with ENGL 3450. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 3700 - Sociology of the Family

The family as a social institution. Historical development and contemporary cross-cultural analysis, with emphasis on the contemporary American family. Cross-listed with SOCY 3700. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 3840 - Independent Study: WGST

Max hours: 6 Credits. **Semester Hours:** 1 to 3

WGST 3939 - Internship

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Junior standing and 2.75 GPA. Max hours: 9 Credits. **Semester Hours:** 1 to 3

WGST 4215 - Women's Rights, Human Rights: Global Perspectives

Explores the global feminist movement's campaign to "engender" human rights. Examination of women's human-rights issues and the critique of this campaign as representing cultural imperialism. Prereq: 6 hours of political science or permission of instructor. Cross-listed with PSCI 4215. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4230 - Women in the West

Focuses on ways in which women, from the mid-19th century through the mid-20th century, of different races, classes, and ethnic background, have interacted and been active participants in the development of the western states. Cross-listed with HIST 4230, HIST 5230 and WGST 5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4248 - Gender, Globalization and Development

Analyzes the effects of globalization on the gendered processes of international development and strategies to empower women to achieve gender justice across race, class and national divisions. Cross-listed with PSCI 4248/5245 and WGST 5248. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4303 - Sex and Gender in Modern Britain

Examines modern British history by focusing on sex and gender as central aspects in people's lives. Considers the ways gender shapes the realms of politics, economics, society and culture in Britain from the 18th century to the present. Cross-listed with HIST 4303/5303 and WGST 5303. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4306 - Survey of Feminist Thought

Examines changes and continuities in feminist thought from the 18th century to the present, using historical and literary materials. Explores the ways that women's characteristics, experiences, and capabilities have been understood and challenged. Cross-listed with ENGL 4306, 5306, HIST 4306, 5306, WGST 5306. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4307 - History of Sexuality

Explores the relationships between gender and norms, sexual practice, and ideas about sexuality in Europe and the United States. Examines how sex and sexuality have changed over time and how those changes relate to social, cultural, political and economic history. Cross-listed with HIST 4307/5307 and WGST 5307. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4308 - Contemporary Feminist Thought

This course explores contemporary feminist thought in philosophy and literature in the 20th and 21st centuries. Topics include lesbianism, black feminism, Chicana feminism, transgender identity, women and work and others. Cross-listed with ENGL 4308, ENGL 5308, PHIL 4308, PHIL 5308, WGST 5308. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4345 - Gender, Science, and Medicine: 1600 to the Present

Examines the ways science and medicine have both shaped and been shaped by ideas about gender. Pays particular attention to the relationship between scientific/medical ideas about the sexes and the social organization of gender. Cross-listed with HIST 4345/5345 and WGST 5345. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4420 - Goddess Traditions

Explores the many forms which goddesses have assumed through history, including the Neolithic Great Mother and her heiresses in the ancient Mediterranean cultures, such as: Isis, Ishtar, Demeter, Hecate, Aphrodite, Artemis, Athena and others, and their parallels in India. Goddess traditions have encompassed a full spectrum from virgins to Great Mothers to dark underworld goddesses of death and destruction. Cross-listed with RLST 4420/5420 and WGST 5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4500 - Feminist Philosophy

Seminar on key debates & figures in historical & contemporary feminist philosophy. Topics may include: rights, embodiment, gender, sexuality, race, reason, & violence. Figures may include: Wollstonecraft, Stanton, Beauvoir, Judith Butler, and bell hooks. Crosslisted with WGST 5500, PHIL 4500 & 5500. **Semester Hours:** 3 to 3

WGST 4510 - Whores and Saints: Medieval Women

Studies how women are presented in texts, as well as works by women. Investigates the roles open to women and societal attitudes toward women, who were considered seductresses, saints, scholars and warriors in the middle ages. Prereq: Nine hours of literature courses or instructor permission. Cross-listed with ENGL 4510/5510, RLST 4730/5730 and WGST 5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4511 - French Women Writers

Designed to explore writings by French and Francophone women from the Middle Ages to the present. Addresses the question of what it means to be a woman and want to write. The selections include a wide variety of genres: autobiographical writings, stories, poems, manifestos, letters, political and historical documents. Prereq: FREN 3112 or FREN 3122 plus one other 3000-level French course or permission of instructor. Cross-listed with FREN 4510/5510 and WGST 5511. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4540 - Race, Class, and Gender in Spanish Golden Age Literature

Explores works of various genres in relation to their social and political contexts in 16th and 17th century Spain, emphasizing the cultural attitudes toward race, class, and gender that inform them. Prereq: junior standing or higher. Cross-listed with SPAN 4340/5340 and WGST 5540. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4555 - International Women's Resistance

Examines local and international struggles of women to build peace and justice by resisting systems of inequality such as colonialism, racism, patriarchy, globalization, and religious intolerance. Cross-listed with PSCI 4555/5555, ETST 4555 and WGST 5555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4564 - Gender and Politics

Analysis of the political experience of women and of strategies for change. Emphasis on the U.S. Cross-listed with PSCI 4564. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4610 - Communication, media, and sexuality

Developing tools to think critically about representations of sexuality and to understand the social construction of sexuality, the role of sexual representations in mass media and society and the complex relationship between sexual acts, identities and desires. Cross-listed with COMM 4610. Restriction: Restricted to Junior, Senior, or permission of instructor. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4710 - Women and Religion

A sociological exploration of the contemporary roles of women in religion. Course examines American and world religious groups with an eye to women's involvement. Considers how women have changed these traditions as they take on leadership roles and discusses the tensions that arise within these traditions as a result of their expanded participation. Cross-listed with HUMN 5710, SSCI 4710/5710, WGST 5710, RLST 4710/5710. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4827 - Women and the Law

Examines the role of the courts in the development of public policy toward women; how the legal system affects the

economic power, family roles, safety and political participation of women. Cross-listed with PSCI 4827 and ETST 4827. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 4840 - Independent Study

Prereq: permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

WGST 4880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

WGST 4933 - Philosophy of Eros

What does it mean to understand philosophy as an erotic activity? This question will be examined, first by studying Plato's dialogues-such as Lysis, Symposium and Republic-and then by reading texts from Sigmund Freud, Michael Foucault and others. Cross-listed with PHIL 4933/5933, WGST 5933, SSCI 5933 and HUMN 5933. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5230 - Women in the West

Focuses on ways in which women, from the mid-19th century through the mid-20th century, of different races, classes, and ethnic background, have interacted and been active participants in the development of the Western states. Cross-listed with WGST 4230 and HIST 4230/5230. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5248 - Gender, Globalization and Development

Analyzes the effects of globalization on the gendered processes of international development and strategies to empower women to achieve gender justice across race, class and national divisions. Cross-listed with WGST 4248 and PSCI 4248/5245. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5303 - Sex and Gender in Modern Britain

Examines modern British history by focusing on sex and gender as central aspects in people's lives. Considers the ways gender shapes the realms of politics, economics, society and culture in Britain from the 18th century to present. Cross-listed with WGST 4303 and HIST 4303/5303. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5306 - Survey of Feminist Thought

Examines changes and continuities in feminist thought from the 18th century to the present, using historical and literary materials. Explores the ways that women's characteristics, experiences, and capabilities have been understood and

challenged. Cross-listed with ENGL 4306, 5306, HIST 4306, 5306, WGST 4306. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5307 - History of Sexuality

Explores the relationships between gender and norms, sexual practice, and ideas about sexuality in Europe and the United States. Examines how sex and sexuality have changed over time and how those changes relate to social, cultural, political and economic history. Cross-listed with WGST 4307 and HIST 4307/5307. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5308 - Contemporary Feminist Thought

This course explores contemporary feminist thought in philosophy and literature in the 20th and 21st centuries. Topics include lesbianism, black feminism, Chicana feminism, transgender identity, women and work and others. Cross-listed with ENGL 4308, ENGL 5308, PHIL 4308, PHIL 5308, WGST 4308. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5345 - Gender, Science and Medicine: 1600 to the Present

Examines the ways science and medicine have both shaped and been shaped by ideas about gender. Pays particular attention to the relationship between scientific/medical ideas about the sexes and the social organization of gender. Cross-listed with WGST 4345 and HIST 4345/5345. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5420 - Goddess Traditions

Explores the many forms which goddesses have assumed through history, including the Neolithic Great Mother and her heiresses in the ancient Mediterranean cultures, such as: Isis, Ishtar, Demeter, Hecate, Aphrodite, Artemis, Athena and others, and their parallels in India. Goddess traditions have encompassed a full spectrum from virgins to Great Mothers to dark underworld goddesses of death and destruction. Cross-listed with WGST 4420 and RLST 4420/5420. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5500 - Feminist Philosophy

Seminar on key debates & figures in historical & contemporary feminist philosophy. Topics may include: rights, embodiment, gender, sexuality, race, reason, & violence. Figures may include: Wollstonecraft, Stanton, Beauvoir, Judith Butler, and bell hooks. Crosslisted with WGST 4500, PHIL 4500 & 5500. **Semester Hours:** 3 to 3

WGST 5510 - Whores and Saints: Medieval Women

Studies how women are presented in texts, as well as works by women. Investigates the roles open to women and societal attitudes toward women, who were considered seductresses, saints, scholars and warriors in the middle ages. Prereq: Nine hours of literature courses or instructor permission. Cross-listed with WGST 4510, ENGL 4510/5510 and RLST 4730/5730. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5511 - French Women Writers

Designed to explore writings by French and Francophone women from the Middle Ages to the present. Addresses the question of what it means to be a woman and want to write. The selections include a wide variety of genres: autobiographical writings, stories, poems, manifestos, letters, political and historical documents. Prereq: FREN 3112 or 3122 plus one other 3000-level French course or permission of instructor. Cross-listed with WGST 4511 and FREN 4510/5510. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5540 - Race, Class and Gender in Spanish Golden Age Literature

Explores works of various genres in relation to their social and political contexts in 16th and 17th century Spain, emphasizing the cultural attitudes toward race, class, and gender that inform them. Prereq: graduate standing. Cross-listed with WGST 4540 and SPAN 4340/5340. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5555 - International Women's Resistance

Examines local and international struggles of women to build peace and justice by resisting systems of inequality such as colonialism, racism, patriarchy, globalization, and religious intolerance. Cross-listed with WGST 4555, ETST 4555 and PSCI 4555/5555. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5710 - Women and Religion

A sociological exploration of the contemporary roles of women in religion. Course examines American and world religious groups with an eye to women's involvement. Considers how women have changed these traditions as they take on leadership roles and discusses the tensions that arise within these traditions as a result of their expanded participation. Cross-listed with HUMN 5710, SSCI 4710/5710, WGST 4710, RLST 4710/5710. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5720 - Sexuality, Gender and Their Visual Representations

Studies sexuality, gender and identity representation from classical antiquity through the present in the visual arts. Uses the literature of visibility, feminism, race and queer theory. Explores representations of femininity, masculinity and androgyny and their reinforcement and challenge to gender-identity norms. Cross-listed with HUMN 5720 and SSCI 5720. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 5840 - Independent Study

Prereq: permission of instructor. Max hours: 12 Credits. **Semester Hours:** 1 to 3

WGST 5880 - Directed Research

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Max hours: 6 Credits. **Semester Hours:** 1 to 6

WGST 5900 - Smart Girl Coaching Training and Practicum

Course provides training (lecture and role-playing) in coaching and mentoring which will be applied to support near-peer guides in delivering the Smart Girl curriculum in school settings. Following the completion of the training, students work as coaches for teams of near-peer mentors and groups of teenage girls in the Denver Community, and apply the skills learned in their training. Max hours: 6 Credits. **Semester Hours:** 3 to 3

WGST 5933 - Philosophy of Eros

What does it mean to understand philosophy as an erotic activity? This question will be examined, first by studying Plato's dialogues-such as Lysis, Symposium and Republic-and then by reading texts from Sigmund Freud, Michael Foucault and others. Cross-listed with PHIL 4933/5933, WGST 4933, SSCI 5933 and HUMN 5933. Max hours: 3 Credits. **Semester Hours:** 3 to 3

WGST 6010 - Methods and Theories of Feminism and Gender Studies

Provides graduate-level interdisciplinary study in historiography, methodologies and theories of women's, gender and sexuality studies and considers how culture is constructed around these categories. Cross-listed with SSCI 6010 and HUMN 6010. Max hours: 3 Credits. **Semester Hours:** 3 to 3

XHAD 6840 - Independent Study: XHAD

- **Semester Hours:** 1 to 3