Course Roster

ACCT Accounting

ACCT 2301 Principles of Accounting I
Credit: 3 | Lecture: 3 | Lab: 0
Accounting concepts and their application in transaction analysis and financial statement preparation; analysis of financial statements; and asset and equity accounting in proprietorships, partnerships and corporations.

ACCT 4346 Business Ethics for Accountants
Credit: 3 | Lecture: 3 | Lab: 0
The objective of this course is to provide the student with an educational background in what constitutes ethical conduct in business and accounting. It will provide a framework for making ethical decisions in a student’s professional career in accounting. Requires reading and comprehending complex case problems and the use of critical thinking skills to determine a solution. Solutions must be presented in writing in a coherent and grammatically correct manner. Expertise in accounting is required as the cases involve some forensic work to determine what happened and what should have happened.
Prerequisites: ACCT 3341 and ACCT 3342 OR ACCT 5133 and ACCT 5134.

ACCT 5131 Accounting for Administrative Control
Credit: 3 | Lecture: 3 | Lab: 0
Cost concepts and behavior, performance measurement and analytical uses of accounting data for administrative decisions in merchandising, manufacturing, and service organizations. May not be taken by accounting majors for graduate elective credit.

ACCT 5133 Financial Accounting I
Credit: 3 | Lecture: 3 | Lab: 0
An in-depth study of conceptual and technical aspects of financial accounting. Emphasis is placed on valuation and measurement problems associated with financial statement preparation. May not be taken by accounting majors for graduate elective credit.
Prerequisites: ACCT 2301 or equivalent.

ACCT 5134 Financial Accounting II
Credit: 3 | Lecture: 3 | Lab: 0
Continuation of Financial Accounting I. Emphasis is placed on valuation and measurement problems associated with financial statement preparation. May not be taken by accounting majors for graduate elective credit.
Prerequisites: ACCT 5133 or equivalent in-depth study of conceptual and technical aspects of financial accounting.

ACCT 5137 Principles of Auditing
Credit: 3 | Lecture: 3 | Lab: 0
A study of the auditor’s attest function with emphasis on auditing theory and standards, legal and professional responsibilities, ethics, risks and planning considerations. May not be taken by accounting majors for graduate elective credit.
Prerequisites: Corequisite/ACCT 5332 or equivalent.
ACCT 5231 Individual Income Tax  
Credit: 3 | Lecture: 3 | Lab: 0  
Principles of federal income tax as applied to individuals; tax consequences of business decisions and accounting procedures.  
**Prerequisites: Principles of Accounting or equivalent.**

ACCT 5234 Corporate and Pass Through Entity Taxation  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses entity level taxation including: corporations, partnerships, limited liability companies, limited liability partnerships, S corporations, and fiduciaries. The course examines the link between the accounting information reported for financial statement purposes and the information reported on business tax returns. Prerequisites: ACCT 2301 or equivalent  
**Prerequisites: ACCT 2301 or equivalent**

ACCT 5331 Accounting Analysis for Management Decisions  
Credit: 3 | Lecture: 3 | Lab: 0  
The role of cost systems in aiding short-run and strategic management decisions in manufacturing and service organizations.  
**Prerequisites: ACCT 5131 and FINC 5231 or equivalents.**

ACCT 5332 Accounting Information Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
Course discusses the conceptual aspects of accounting systems and how they are used in the managerial decision-making process; includes discussion and applications of basic business processes and documentation of those processes in the context of internal controls (e.g., identifying risks and controls in information systems). Course includes hands-on experience in flowcharting software, spreadsheets, accounting software, database software, and generalized auditing software (IDEA).  
**Prerequisites: ACCT 2301 and ISAM 5330 or equivalents.**

ACCT 5333 Fundamentals of Databases and Business Intelligence  
Credit: 3 | Lecture: 3 | Lab: 0  
The topics covered include the following: (1) database concepts such as database models, modeling techniques and normalization; design, development, and maintenance of a relational database; formulation of commands to insert and update data, retrieve information, generate reports from a database; and (2) business intelligence concepts such as: business intelligence architecture; schema of a data warehouse; online analytical processing; big data; and NoSQL databases. Includes numerous hands-on assignments. (Cross-listed with ISAM 5331).  
**Prerequisites: ISAM 5030 or 6 hours college-level coursework in programming.**
ACCT 5334 Advanced Database Applications Development
Credit: 3 | Lecture: 3 | Lab: 0
The course covers advanced commands and techniques to: design, develop and maintain a database; insert and update data in a database, retrieve information and generate reports and develop and implement database objects to manage, control and administer database processing. Includes numerous hands-on assignments. The coursework requirements also include Oracle SQL and Oracle PL/SQL certifications. (Cross-listed with ISAM 5632.)
Prerequisites: ACCT 2301 or equivalent.

ACCT 5335 Information Systems Audit and Security
Credit: 3 | Lecture: 3 | Lab: 0
Discussion of the audit process, internal controls as they relate to technology, and business process documentation. Study of business processes, deployment and management of technology resources, risk assessment and change management, IT networks, and IT governance. Extensive hands-on experience detecting fraud using generalized audit software (IDEA). Discussion of computer forensics and other current topics related to IT security. Written communication skills are emphasized through the preparation of audit reports based on findings from fraud detection assignments. Covers topics tested in the Certified Information Systems Auditor (CISA) exam. (Crosslisted with ISAM 5731.)
Prerequisites: ISAM 5330 or equivalent.

ACCT 5336 Systems Analysis and Design
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a step-by-step approach to developing computer-based information systems. It covers topics such as: systems development life cycle; systems development methodologies; system requirements determination and analysis; user-interface design; programs design and system architecture. The course includes a comprehensive group project. (Cross-listed with ISAM 5635.)
Prerequisites: ISAM 3034, ISAM 5030, or 6 hours of programming courses and ACCT 5333 or equivalent.

ACCT 5337 ERP System Concepts and Practices
Credit: 3 | Lecture: 3 | Lab: 1
This course examines the integrated nature of business processes and how ERP systems can be configured to handle those processes. Students receive hands-on experience using SAP’s current enterprise software. (Cross-listed with ISAM 5431.)
Prerequisites: ACCT 5333 or equivalent.

ACCT 5431 Advanced Accounting
Credit: 3 | Lecture: 3 | Lab: 0
Accounting and reporting of domestic and foreign consolidated corporations and branches, governmental and other not-for-profit entities. Prerequisites: ACCT 5134 or equivalent.
ACCT 5432 Acct for Government and Not-For-Profit Organizations  
Credit: 3 | Lecture: 3 | Lab: 0  
The course covers the governmental and not-for-profit environment, fund accounting, budgeting, revenue and expenditure recognition, financial reporting requirements, and current issues.  
Prerequisites: ACCT 2301 or equivalent.

ACCT 5436 Principles of Internal Auditing  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is meant to provide students with an introduction to the internal auditing process and profession. Topics include definitions, frameworks, risk identification/analysis, governance/control issues, and conducting internal audit engagements (to include writing audit reports).  
Prerequisites: ACCT 3432 Intermediate Accounting II or ACCT 5134 equivalent.

ACCT 5437 Principles of Business Evaluation  
Credit: 3 | Lecture: 3 | Lab: 0  
Principles of Business Valuation teaches the theory and methods in evaluating the value of a closely held business or ownership interest. The course will teach the theories and standards in business valuation, analysis of financial statements to estimate future income and cash flows, and all of the three commonly used approaches of business valuation. Through this course, students will acquire the basic skills and work on real world style projects in valuing private businesses and equity investments.  
Prerequisites: ACCT 5134 or equivalent

ACCT 5438 Fundamentals of Data Analytics in Accounting  
Credit: 3 | Lecture: 3 | Lab: 1  
This course provides students with the fundamentals of data analytics with a focus on the area of accounting. Students will learn and practice analytical methods used in accounting, become proficient in understanding and presenting data, develop an ability to evaluate the integrity of data, and gain proficiency in using computer applications for data analyses. Students will also be required to complete a written case analysis relating to data analytics.  
Prerequisites: ACCT 2301 or equivalent, FINC 5231 or equivalent, ISAM 5330 or equivalent.

ACCT 5531 International Accounting  
Credit: 3 | Lecture: 3 | Lab: 1  
This course addresses the current status of the international financial reporting standards (IFRS) and is designed to examine both managerial and financial reporting issues that arise when multinational enterprises report under IFRS or other national financial reporting regimes. The approach is from the user's perspective. Multinational challenges encountered in analyzing financial statements, such as currency translation issues, are addressed.  
Prerequisites: ACCT 2301 or equivalent.

ACCT 5931 Research Topics in Accounting  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.
ACCT 5939 Independent Studies in Accounting
Credit: 3 | Lecture: 3 | Lab: 0
Independent directed study in Accounting.
Prerequisites: Approval of Instructor, Faculty Chair and Associate Dean required.

ACCT 6731 Seminar in Financial Statement and Accounting Information Quality Analysis
Credit: 3 | Lecture: 3 | Lab: 0
The course is designed to provide students with a theoretical and practical framework to analyze financial accounting information provided by management and to understand how various financial reporting strategies affect the quality of accounting information and the value of firms using a variety of analytical tools.
Prerequisites: ACCT 5134 or equivalent.

ACCT 6732 Seminar in Fraud Examination and Audit Risk (Capstone)
Credit: 3 | Lecture: 3 | Lab: 0
Principles, analysis, and application of concepts related to fraud examination, fraud detection, and fraud deterrence. Current issues related to audit risk assessment and planning are also included.
Prerequisites: Other degree requirements and LAST SEMESTER, or permission from instructor.

ACCT 6735 Oil and Gas Accounting
Credit: 3 | Lecture: 3 | Lab: 0
Accounting for the exploration and production activities of a petroleum company. Major topics include industry background, successful efforts accounting, full cost accounting, tax accounting and required disclosures.
Prerequisites: ACCT 5133 or permission from instructor.

ACCT 6739 Internship in Accounting
Lecture: 0 | Lab: 1
Supervised work experience each week in an approved accounting firm, governmental agency, or business. Written work as required by sponsoring faculty member.
Prerequisites: Master's degree candidacy, approval of Associate Dean and Department Chair, and sponsoring faculty member.

ACCT 6939 Master's Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Master's degree candidacy and approval of adviser and dean.

ACCT 6969 Master's Thesis Research
Credit: 6 | Lecture: 6 | Lab: 0
Prerequisites: Master's degree candidacy and approval of adviser and dean.

ADSU Administration and Supervision

ADSU 5010 Professional Preparation Seminar
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to assist students in the principal certification program to understand the state certification standards for successful entry into their chosen educational field. This course may be waived if the candidate has earned a passing score on the TExES. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plan.
Prerequisites: An approved, signed degree or certification plan on file in the COE.
ADSU 5931 Research Topics in Educational Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

ADSU 5939 Independent Study in Educational Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

ADSU 6030 Introduction to Educational Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
The course content has been approved by the Texas Education Agency and meets the guidelines for Instructional Leadership Development required for administrators and supervisors. This course focuses on principles and skills of educational leadership necessary to facilitate continuous campus improvement, including data-driven decision making, curriculum, instruction, assessment, developmental supervision, professional development, community partnerships, communication, organizational management, and evaluation.

ADSU 6130 Administrative Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on technological applications for school administrative systems focusing on communication, presentation, and management systems.

ADSU 6132 Curriculum  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to prepare building-level leaders to understand national and State of Texas practices and theory related to legal curricular issues as well as the design and alignment, implementation, analysis and methods of evaluation of school curriculum, and school curricular programs.

ADSU 6233 Principalship  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the application of interpersonal, technical, human, and conceptual skills required of building-level administrators to engage in organizational vision-building, decision-making, problem-solving, and effective leadership in learning environments; study of leadership approaches for use with various school constituencies.

ADSU 6235 Administration of Special Programs  
Credit: 3 | Lecture: 3 | Lab: 0  
This course concentrates on program planning, implementation, evaluation and improvement through study and development of special programs that meet local, state, and national needs and requirements.

ADSU 6237 Student Legal Matters  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses school law as it relates to student issues as well as legal requirements related to the implementation and maintenance of special programs that meet local, state, and national needs and requirements.
ADSU 6333 Instructional Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to prepare building-level administrators to advocate, nurture, and sustain an instructional program and a campus culture that are conducive to student learning and staff professional growth. Students are required to conduct in-depth research on professional growth and/or development as it relates to formative evaluation.

ADSU 6432 Management Theory  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on adaptations of the fundamentals of management to program development, personnel, and fiscal resources.

ADSU 6434 Administration of School Personnel  
Credit: 3 | Lecture: 3 | Lab: 0  
This course follows the official guidelines for training appraisers as required for the Texas Professional Development and Appraisal System. It is designed to apply legal requirements for all aspects of personnel management as well as prepare building-level administrators for legal issues related to teachers and employees.  
Prerequisites: ADSU 6030.

ADSU 6436 School Resource Management  
Credit: 3 | Lecture: 3 | Lab: 0  
This course explores the fundamentals of planning, cost accounting, quantitative evaluation of needs and resources, and application of prudent business practices to school finance.

ADSU 6437 School Law  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses state and federal school law and court decisions affecting the authority, responsibilities, liabilities, and appeals related to the operations of public school systems and student issues as well as legal requirements related to the implementation and maintenance of special programs that meet local, state, and national needs and requirements.

ADSU 6533 Appraisal of Teaching  
Credit: 3 | Lecture: 3 | Lab: 0  
This course follows the official guidelines for training appraisers as required for the Texas Teacher Appraisal System. Students are also required to do in-depth research on professional growth and/or development as it relates to evaluation.  
Prerequisites: ADSU 6030.

ADSU 6537 Interpersonal Communication  
Credit: 3 | Lecture: 3 | Lab: 0  
This course, designed for students of school administration, focuses on understanding different communication styles, developing skills for speaking and listening effectively, improving written communications, and mastering the steps of effective group presentations.

ADSU 6538 Program, Policy and Politics  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a study of local, state and national policy and politics as instruments of program change, development, control, and reform. Emphasis is given to the role of the principal in school policy matters.
ADSU 6638 The Principal and School Community Relations
Credit: 3 | Lecture: 3 | Lab: 0
This is a supervised internship with a focus on the application of interpersonal skills in campus leadership and study of leadership approaches for use with various school constituencies in an approved educational environment. Course content and requirements also address successfully passing the TExES PASL examination. Written and oral reports required.
Prerequisites: Submitted application, ADSU 6030, 6132, 6233, and 6533 (or appropriate substitutes), approval of Associate Dean, and a passing score on the Principal (268) TExES.

ADSU 6735 Leadership Research Seminar
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a demonstration of acquired competency through research on current educational leadership topics. This capstone experience provides a rich opportunity to demonstrate the inter-relatedness of theory and practice.
Prerequisites: Completion of all ADSU coursework in plan of study.

ADSU 6739 Graduate Practicum
Credit: 3 | Lecture: 0 | Lab: 0
This is a supervised internship in an approved educational environment. Written and oral reports required.
Prerequisites: Completed application, approval of Associate Dean, successful completion of ADSU 6638

ANTH Anthropology

ANTH 5333 Cultures of Mexico and Central America
Credit: 3 | Lecture: 3 | Lab: 0
Survey of anthropological approaches to regions of Mexico, Central America, and the U.S.-Mexico border. Students will be exposed to methods, theories, and case studies and will gain skills required to conduct future research on this topic.

ANTH 5334 Native American Cultures
Credit: 3 | Lecture: 3 | Lab: 0
Examination of social and cultural diversity of indigenous peoples of North America from anthropological and historical perspectives.

ANTH 5531 Families, Communities, and Globalization
Credit: 3 | Lecture: 3 | Lab: 0
Examination of ideas of family, race, gender, and relatedness in transnational and cross-cultural perspectives. Draws on case studies from anthropology and other fields.

ANTH 5535 Cultures of Asia
Credit: 3 | Lecture: 3 | Lab: 0
Survey of anthropological approaches to Asian societies.

ANTH 5537 Topics in African Studies
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of cultural diversity of African societies and African diaspora. Students will engage with methods, theories, and case studies and gain skills required to conduct research on the topic. Topics vary; may be repeated for credit with permission of instructor. (Cross-listed with CRCL 5537.)
ANTH 5538 Cultures of the Middle East  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of anthropological and other approaches to understanding societies of the Middle East. Students will be exposed to methods, theories, and case studies and will gain skills required to conduct future research on the topic.

ANTH 5931 Research Topics in Anthropology  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

ANTH 5939 Independent Study in Anthropology  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

ARTS Arts

ARTS 5037 Studies in Art History  
Credit: 3 | Lecture: 3 | Lab: 0  
Understanding and interpreting art history. Topics vary; may be repeated for credit with permission of instructor.

ARTS 5038 Crafts Design and History  
Credit: 3 | Lecture: 3 | Lab: 1  
Supervised projects in crafts history, design, and techniques. Topics vary; may be repeated for credit.

ARTS 5231 Sculpture and Ceramics Studio  
Credit: 3 | Lecture: 0 | Lab: 3  
Supervised projects. Investigation of three-dimensional artwork, approaches, and processes. Topics vary; may be repeated for credit with permission of instructor.

ARTS 5233 Art of Ancient Iraq and the Near East  
Credit: 3 | Lecture: 3 | Lab: 0  
The art, history, and culture of Ancient Iraq and the Near East. Topics include prehistoric art, state formation, ideology, and empire. (Cross-listed with HUMN 5233.)

ARTS 5234 Art of the Ancient Greek World  
Credit: 3 | Lecture: 3 | Lab: 0  
An introduction to art history and culture of ancient Greece from the Bronze Age through the Hellenistic period. (Cross-listed with HUMN 5234.)

ARTS 5236 Roman Art and Architecture  
Credit: 3 | Lecture: 3 | Lab: 0  
The art, history, and culture of the ancient Roman world from the foundation of Rome (753 B.C.E.) through Constantine (337 C.E). An investigation of architecture, sculpture, painting and other arts, especially as they relate to the social and political developments of ancient Italy and the Mediterranean region.

ARTS 5331 Painting–Drawing–Printmaking  
Credit: 3 | Lecture: 0 | Lab: 3  
Supervised projects. Topics vary; may be repeated for credit with permission of instructor.

ARTS 5931 Research Topics in Art  
Credit: 3 | Lecture: 3 | Lab: 1  
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

ARTS 5939 Independent Study in Art  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.
ASTR Astronomy and Space Science (see also Physics)

ASTR 5131 Graduate Astronomy
Credit: 3 | Lecture: 3
Quantitative introduction to physics of the stars, interstellar medium, cosmochemistry, the Galaxy, and Universe as determined from a variety of astronomical observations and models.

ASTR 5231 Stellar Structure and Evolution
Credit: 3 | Lecture: 3
Principal concepts, equations, methods and results of the theories of stellar atmosphere and interiors and their relation to observations. 
Prerequisites: Core Physics courses or instructor approval.

ASTR 5331 Remote Sensing Instrumentation and Techniques
Credit: 3 | Lecture: 3
Fundamentals of remote sensing; radiative quantities; radiative transfer theory and applications; interaction mechanisms, applications to the development of uses for remote sensing systems from spacecraft and aircraft.
Prerequisites: Core Physics courses or instructor approval.

ASTR 5431 Fundamentals of Astrodynamics
Credit: 3 | Lecture: 3
Development of the two-body problem and universal formulation of all types of orbits, initial value problems, two-point boundary value problems, coordinate transformations and trajectory perturbations.
Prerequisites: Core Physics courses or instructor approval.

ASTR 5432 Perturbation Methods in Astrodynamics
Credit: 3 | Lecture: 3
A study of the methods of the solution to the perturbed two-body problem with applications to the motion of satellites.
Prerequisites: ASTR 5431 or instructor approval.

ASTR 5531 Planetary Science
Credit: 3 | Lecture: 3
Planetary dynamics, planetary interiors, atmospheres and surfaces; magnetism; models of solar system origin.
Prerequisites: Physical geology or equivalent.

ASTR 5631 Astrobiophysics I
Credit: 3 | Lecture: 3
Origin of the universe, stars and planetary systems. Origin and evolution of Earth as a habitable planet and origin and evolution of life.
Prerequisites: PHYS 4342, PHYS 4351, PHYS 5531

ASTR 5632 Astrobiophysics II
Credit: 3 | Lecture: 3
The search for life in the universe, including possibilities for finding life on Mars and other solar system bodies and on extra-solar planets and the Search for Extra-Terrestrial Intelligence (SETI).
Prerequisites: ASTR 5631.

ASTR 5931 Research Topics in Space Science
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

ASTR 5939 Independent Study in Space Science
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean required.
BAPA Business and Public Administration

BAPA 5031 Survey of Business Principles
Credit: 3 | Lecture: 3 | Lab: 0
An introduction to and survey of business principles including principles of statistics, economics, and marketing theory and practice. Topics from statistics may include sampling, data measurements, descriptive statistics, probability, probability distributions, confidence intervals, hypotheses testing, correlation, simple and multiple regression, ANOVA, forecasting, and statistical process control. Topics from economics may include principles and analysis of microeconomic and macroeconomic issues and concepts as applied in a domestic and global setting. Topics from marketing may include how product, distribution, promotion and pricing strategies are determined in a dynamic environment to create customer value. May not be taken as graduate elective credit by any BUS student.

BAPA 5131 The Global Environment of Business
Credit: 3 | Lecture: 3 | Lab: 0
Explores theories, institutions, and tools relevant to understanding and coping with globalization. Topics covered include technological change, national differences in political economy, cultural and ethical issues, trade policy, international capital flows, and the strategy of international business.

BAPA 5636 Entrepreneurship and Small Business Consulting
Credit: 3 | Lecture: 3 | Lab: 0
Application of classroom concepts, theories and principles, from all business disciplines to active operating small businesses or new business ventures. This course will qualify as a business elective.
Prerequisites: MGMT 5032 or equivalent.

BAPA 5915 Co-op Education in Business
Credit: 1 | Lecture: 1 | Lab: 0
Educational paid work assignment by a student in the field of his or her career interest and course of study. A technical report will be required at the end of the semester. Qualifies as a BUS elective.
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of the Director of Cooperative Education.

BAPA 5935 Co-op Education in Business
Credit: 3 | Lecture: 3 | Lab: 0
Educational paid work assignment by a student in the field of his or her career interest and course of study. A technical report will be required at the end of the semester. Qualifies as a BUS elective.
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of the Director of Cooperative Education.
BIOL Biology

BIOL 1106 Laboratory for Biology for Science Majors I
Credit: 1 | Lecture: 0 | Lab: 1
Laboratory exercises in basic biochemistry, cell biology, cell metabolism and energetics, photosynthesis, genetics, evolution, taxonomy, bacteria and viruses. Credit may not be received for both BIOL 1106 and BIOL 1108.
Corequisites: BIOL 1306

BIOL 1107 Laboratory for Biology for Science Majors II
Credit: 1 | Lecture: 0 | Lab: 1
Laboratory exercises relating to fungi, protists, plants, plant function, animals, animal physiology and ecology. Credit may not be received for both BIOL 1107 and BIOL 1109.
Corequisites: BIOL 1307

BIOL 1306 Biology for Science Majors I
Credit: 3 | Lecture: 3 | Lab: 0
A general biology course including basic biochemistry, cell biology, cell metabolism and energetics, photosynthesis, genetics, evolution, taxonomy, bacteria and viruses.

BIOL 1307 Biology for Science Majors II
Credit: 3 | Lecture: 3 | Lab: 0
A continuation of Biology for Science Majors I with emphasis on fungi, protists, plants, plant function, animals, animal physiology and ecology. Credit may not be received for both BIOL 1307 and BIOL 1309.
Corequisites: BIOL 1107

BIOL 2321 Microbiology for Science Majors
Credit: 3 | Lecture: 3 | Lab: 0
Study of the morphology, physiology and taxonomy of representative groups of pathogenic and non-pathogenic microorganisms.
Prerequisites: BIOL 1306, BIOL 1307, CHEM 1311, CHEM 1312
Corequisites: BIOL 2121

BIOL 3311 Marine Biology
Credit: 3 | Lecture: 3
Study of marine organisms and their environment. One or more weekend or weekday field trips and limited laboratory exercises are required.
Prerequisites: BIOL 1306, BIOL 1307

BIOL 3333 Environmental Biology
Credit: 3 | Lecture: 3
The impacts of pollution, anthropogenic activities and other stresses on ecosystem structure and function. Course designed for science majors.

BIOL 3341 Molecular Genetics
Credit: 3 | Lecture: 3
Study of the molecular basis of genetics, including transmission genetics and population genetics. BIOL 3141 must be taken concurrently or following BIOL 3341.
Prerequisites: BIOL 1306, BIOL 1307.

BIOL 4305 Ecology of the Amazon
Credit: 3 | Lecture: 3
Study of the physical, chemical and ecological aspects of the Amazon flooded forest. Students completing course qualify for discounted optional ecology study trip to the Amazon flooded forest areas of Brazil.
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| BIOL 4311   | Ecology                                          | 3      | 3       | Theoretical study of organisms, populations and communities related to their environments.  
|             |                                                  |        |         | **Prerequisites:** BIOL 1306, BIOL 1307.                                          |
| BIOL 4332   | Histology                                        | 3      | 3       | Study of microscopic structure of animal and human tissues, including theories of fixation and staining of clinical samples.  
|             |                                                  |        |         | **Prerequisites:** BIOL 3373                                                   |
| BIOL 4334   | Environmental Microbiology                       | 3      | 3       | Study of activity and mechanisms of microbial contribution to global ecosystems with emphasis on geochemical cycling, bioremediation, wastewater treatment, metagenomics and laboratory investigations.  
|             |                                                  |        |         | **Prerequisites:** BIOL 2321                                                   |
| BIOL 4341   | Biochemistry I                                   | 3      | 3       | Study of cellular biochemical components and metabolism.  
|             |                                                  |        |         | **Prerequisites:** BIOL 1306, BIOL 1307 and CHEM 2323                           |
| BIOL 4342   | Biochemistry II                                  | 3      | 3       | Regulation and control of intermediary metabolism. Introduction to biochemical genetics.  
|             |                                                  |        |         | **Prerequisites:** BIOL 4341                                                   |
| BIOL 4343   | Plant Physiology                                 | 3      | 3       | Metabolic and physiological processes involved in plant growth.  
|             |                                                  |        |         | **Prerequisites:** BIOL 1306, BIOL 1307.                                          |
| BIOL 4344   | Comparative Animal Physiology                    | 3      | 3       | Survey of bodily functions in both vertebrates and invertebrates. Emphasis will be on the use of the comparative approach in understanding how animals physiologically respond to and adapt to environmental challenges.  
|             |                                                  |        |         | **Prerequisites:** BIOL 1306, BIOL 1307.                                          |
| BIOL 4345   | Human Physiology                                 | 3      | 3       | This course will introduce basic and advanced principles of human physiology. The study of physiology will be presented using an integrated systems approach. Lectures on topics ranging from physiology of the nervous system to human reproduction will be presented.  
|             |                                                  |        |         | **Prerequisites:** BIOL 1306, BIOL 1307.                                          |
| BIOL 4347   | Cellular Physiology                              | 3      | 3       | Cell structure and function; emphasis on cytological, biochemical, genetical and developmental perspectives.  
|             |                                                  |        |         | **Prerequisites:** BIOL 4341                                                   |
| BIOL 4348   | Developmental Biology                            | 3      | 3       | Embryology, tissue differentiation, cell determination and pattern formation at both descriptive and molecular level. Emphasis on animal systems with additional examples from plants and protists.  
|             |                                                  |        |         | **Prerequisites:** BIOL 3341 and either BIOL 4347 or BIOL 3307                  |
BIOL 4351 Molecular Biology  
**Credit: 3 | Lecture: 3**  
Study of how the cell functions at the molecular level, structures of the genome in prokaryotes and eukaryotes, and basic elements involved in the regulation of gene expression.  
*Prerequisites: BIOL 3341 or BIOL 4341.*

BIOL 4371 Cancer Biology  
**Credit: 3 | Lecture: 3**  
Cancer, genetics and heredity: prevention, detection and treatment of cancer.  
*Prerequisites: BIOL 3341 or BIOL 4351 or equivalent.*

BIOL 5131 Membrane Biology  
**Credit: 3 | Lecture: 3**  
Study of synthesis and function of cellular membranes.  
*Prerequisites: Biochemistry.*

BIOL 5132 Cell Signaling  
**Credit: 3 | Lecture: 3**  
Detailed study of signal transduction in living cells. Concentration on current knowledge regarding the manner in which cells communicate with one another, integrate incoming signals and respond in appropriate manner.  
*Prerequisites: BIOL 4341 and BIOL 4347 or equivalent.*

BIOL 5215 Laboratory for Ichthyology  
**Credit: 1 | Lecture: 0 | Lab: 1**  
Advanced laboratory course on identification, anatomy and ecology of fish. Fisheries methods also emphasized. Weekend or weekday field trips and collections required.

BIOL 5233 Ecotoxicology  
**Credit: 3 | Lecture: 3**  
Study of environmental pollutants and effects on ecosystems.  
*Prerequisites: BIOL 4325 or BIOL 5332 or equivalent.*

BIOL 5234 Population and Community Dynamics  
**Credit: 3 | Lecture: 3**  
Application of basic population modeling and analysis methods used in the management of animal populations. Emphasis placed on harvested populations and fisheries.  
*Prerequisites: Coursework in Ecology and Genetics.*

BIOL 5235 Ichthyology  
**Credit: 3 | Lecture: 3**  
Advanced study of biology, ecology and evolution of marine and freshwater fishes.  
*Corequisites: BIOL 5215*

BIOL 5332 Toxicology  
**Credit: 3 | Lecture: 3**  
Evaluation of the mechanisms of action, risks and effects of exposure to toxic substances.  
*Prerequisites: BIOL 4325 or BIOL 4341 or BIOL 4344 or BIOL 4345 or equivalent.*

BIOL 5333 Microbial Ecology  
**Credit: 3 | Lecture: 3**  
Study of the interactions of microorganisms and their environments, including biotic and abiotic components. Topics include metabolic diversity, biogeochemistry, microbial diversity and modern methodologies are discussed with current research articles.  
*Prerequisites: BIOL 2321*
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
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<tbody>
<tr>
<td>BIOL 5334</td>
<td>Microbial Ecology</td>
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<td>Study of the interactions of microorganisms and</td>
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<td>their environments, including biotic and</td>
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<td>diversity, biogeochemistry, microbial diversity,</td>
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<td><em>Prerequisites:</em> BIOL 2321</td>
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<td>BIOL 5336</td>
<td>Neuropsychology Practicum</td>
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<td>Lecture</td>
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<td>Laboratory investigation of drug/brain/behavior</td>
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<td>relationships in the rat. Readings from primary</td>
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<td>research literature, laboratory experiments and</td>
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<td><em>Prerequisites:</em> Permission of instructor (HSH)</td>
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<td>and BIOL faculty adviser.</td>
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<td>BIOL 5417</td>
<td>Lab for Human Gross Anatomy</td>
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<td>Lecture</td>
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<td>This course will cover human gross anatomy in</td>
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<td>both lecture and lab format. The course will be</td>
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<td>taught at Texas Chiropractic College. Prosected</td>
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<td>cadavers will be utilized in the lab. The course</td>
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<td>will focus on musculoskeletal system.</td>
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<td>BIOL 5432</td>
<td>Principles of Pharmacology</td>
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<td>Lecture</td>
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<td>Emphasis on principles for evaluating the effects</td>
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<td>of drugs.</td>
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<td><em>Prerequisites:</em> BIOL 4341, BIOL 4344, or BIOL 4345</td>
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<td>BIOL 5433</td>
<td>Enzymology</td>
<td>3</td>
<td>Lecture</td>
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<td>Study of enzyme isolation, purification, assay</td>
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<td>and characterization. Emphasis on kinetics of</td>
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<td>enzyme catalyzed reactions and on the use of</td>
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<td>enzymes in medicine and industry.</td>
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<td><em>Prerequisites:</em> BIOL 4341.</td>
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<td>BIOL 5435</td>
<td>Advanced Immunology</td>
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<td>Lecture</td>
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<td>Course will allow students to explore published</td>
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<td>research that supports currently accepted</td>
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<td>mechanisms of the immune function. Students</td>
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<td>will be expected to correlate basic principles of</td>
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<td>the immune system to the advances in medicine</td>
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<td>and pathology.</td>
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<td><em>Prerequisites:</em> BIOL 4361 or equivalent.</td>
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<td>BIOL 5436</td>
<td>Physiological Basis of Disease</td>
<td>3</td>
<td>Lecture</td>
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<td>The effects of diseases on normal physiologic</td>
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<td>functions and the physiologic basis of medical</td>
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<td>treatments for these diseases will be discussed.</td>
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<td><em>Prerequisites:</em> BIOL 4345.</td>
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<td>BIOL 5437</td>
<td>Human Gross Anatomy</td>
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<td><em>Corequisites:</em> BIOL 5417</td>
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<td>BIOL 5512</td>
<td>Laboratory for Coastal and Estuarine Ecology</td>
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<td>Lecture</td>
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<td>Laboratory study of estuarine and marine</td>
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<td>organisms and multiple weekday and/or weekend</td>
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<td>field trips to study sites off campus.</td>
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<td>BIOL 5517</td>
<td>Limnology and Aquatic Biology</td>
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<td>Lecture</td>
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<td>Laboratory study of freshwater organisms and</td>
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<td>multiple weekend and/or weekday field trips to</td>
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<td>study sites off campus.</td>
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BIOL 5530 Research Methods in Biology
Credit: 3 | Lecture: 3
Students will develop a research proposal, which allows integrating knowledge and standard procedures in a chosen area of Biology. A written proposal and an oral presentation are required to complete the course.
Prerequisites: Graduate standing.

BIOL 5531 Aquatic Toxicity Testing
Credit: 3 | Lecture: 3
Theory of toxicity testing, statistical analysis procedures and laboratory practice in standard aquatic toxicity tests.
Prerequisites: BIOL 4325 or equivalent.

BIOL 5532 Coastal and Estuarine Ecology
Credit: 3 | Lecture: 3
Study of physical, chemical and biological nature of estuarine ecosystems.
Prerequisites: BIOL 4311.

BIOL 5533 Ecological Methods
Credit: 3 | Lecture: 3
Field methods for analysis of ecological systems. Field work and laboratory are required.
Prerequisites: BIOL 4311

BIOL 5534 Conservation Biology
Lecture: 0 | Lab: 1
Analysis of biological factors that shape species diversity of the earth’s ecosystems and the environmental and sociopolitical issues faced in the conservation of biodiversity.
Prerequisites: BIOL 4311 or equivalent.

BIOL 5535 Neotropical Rainforest Ecology
Lecture: 0 | Lab: 1
Study of neotropical rain forests, including their physical, chemical and geological characteristics and plant /animal ecology. Students completing course qualify for discounted optional ecology study trip to the Amazon flooded forest areas of Brazil.

BIOL 5537 Limnology and Aquatic Biology
Lecture: 0 | Lab: 1
The study of physical, chemical and biological nature of freshwater systems including lakes, ponds, rivers and streams.
Prerequisites: BIOL 4311 or equivalent.

BIOL 5634 Apoptosis
Lecture: 0 | Lab: 1
Students in this course will study the stimuli and pathways involved in programmed cellular death.
Prerequisites: BIOL 4347

BIOL 5635 Neuroscience
Lecture: 0 | Lab: 1
This course introduces basic and advanced concepts in neuroscience. The course covers a wide range of topics in this exciting field of science from the molecular level through the anatomical organization of sensory and motor systems.
Prerequisites: Anatomy, Physiology.

BIOL 5731 Advanced Cancer Biology
Lecture: 0 | Lab: 1
Cancer, genetics and heredity; prevention, detection and treatment of cancer. Literature research and presentation on molecular basis of various cancers required.
Prerequisites: BIOL 3341 or BIOL 4351 or equivalent.
BIOL 5732 Advances in Molecular Biology
Credit: 3 | Lecture: 3
Study of genetic activity at the molecular level, how gene expression is regulated by cis- and trans- elements, RNA slicing, non-coding RNA, riboswitch, telomerase function and regulation, etc.
Prerequisites: BIOL 3341 or BIOL 4351.

BIOL 5733 Epigenetics and miRNA
Credit: 3 | Lecture: 3
Study of epigenetic modifications that can influence gene expression and of microRNAs that can influence protein expression.
Prerequisites: Biochemistry, Genetics and either Cellular Physiology or Molecular Biology

BIOL 5734 Oncogenes
Credit: 3 | Lecture: 3
Study of cancer at the level of the gene.
Prerequisites: Molecular biology.

BIOL 5735 Cell Cycle Regulation
Credit: 3 | Lecture: 3
Study of controls that regulate the cell cycle.
Prerequisites: Biochemistry I

BIOL 5736 Bioethics
Credit: 3 | Lecture: 3
Study of complex situations in biology and medicine that require moral reflection, judgment or decisions.

BIOL 5738 Gene Therapy
Credit: 3 | Lecture: 3
Gene technologies with applications to disease, cancer, neurological and genetic disorders, cardiovascular and infections diseases.
Prerequisites: BIOL 3341 or BIOL 4351.

BIOL 5915 Cooperative Education Work Term
Credit: 1 | Lecture: 1
Educational paid work assignment by a student in the field of his/her career interest and course of study. Technical report will be required at the end of the semester.
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

BIOL 5919 Independent Study in Biological Science
Credit: 1 | Lecture: 1 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

BIOL 5929 Independent Study in Biological Science
Credit: 2 | Lecture: 2
Prerequisites: Approval of instructor, chair and associate dean.

BIOL 5931 Research Topics in Biology
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

BIOL 5939 Independent Study in Biological Science
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean.
BIOL 6838 Research Project and Seminar
Credit: 3 | Lecture: 3
Students will complete a study of the current literature, including methodology and techniques, used in a selected area of Biology. A written review paper and an oral presentation will be required.
Prerequisites: 24 hours completed in approved graduate program.

BIOL 6939 Master's Thesis Research
Credit: 3 | Lecture: 3
Prerequisites: Approval of adviser, master's committee and dean.

BIOL 6969 Master's Thesis Research
Credit: 6 | Lecture: 6 | Lab: 0
Prerequisites: Approval of adviser, master's committee and dean.

BIOT Biotechnology

BIOT 5011 Methods of Biotechnology Discussions
Credit: 1 | Lecture: 2
Web-based lectures for Methods of Biotechnology Laboratory, discussion of laboratory protocols and techniques.

BIOT 5021 Methods of Biotechnology
Credit: 2 | Lecture: 0 | Lab: 4
Required for all students entering the Biotechnology program. Designed to provide training in laboratory skills and analysis. Students will be trained in basic laboratory skills associated with biochemistry, molecular cell biology, prokaryotic; eukaryotic cell culture, microscopy, data analysis, etc.

BIOT 5031 Applied Biotechnology
Credit: 3 | Lecture: 3
Focus on how recombinant DNA technology can be used to create various useful products, e.g., recombinant proteins, therapeutics, vaccines, and antibiotics, using experimental results and actual methodological strategies to illustrate basic concepts. In addition, basics and manipulation of gene expression in various host systems with latest advancements will be discussed in details. Course is designed for students with backgrounds in biochemistry, molecular genetics or microbiology.
Prerequisites: BIOL 4351.

BIOT 5111 Advanced Methods of Biotechnology I Discussions
Credit: 1 | Lecture: 2 | Lab: 0
Lectures for Methods of Biotechnology Laboratory, discussion of laboratory protocols and techniques.
Prerequisites: BIOT 5021, BIOT 5011

BIOT 5112 Advanced Methods of Biotechnology II Discussions
Credit: 1 | Lecture: 2 | Lab: 0
Lectures for Methods of Biotechnology Laboratory, discussion of laboratory protocols and techniques.
Prerequisites: BIOT 5021, BIOT 5011
BIOT 5121 Advanced Methods of Biotechnology I
Credit: 2 | Lecture: 2 | Lab: 0
Designed to provide advanced practical training in current techniques of molecular and cellular biology, including recombinant DNA technology. Southern and Northern analysis of nucleic acids, PCR, DNA sequencing and analysis using current computer programs, western blotting, fluorescence microscopy, etc.
Prerequisites: BIOT 5021, BIOT 5011
Corequisites: BIOT 5111

BIOT 5122 Advanced Methods of Biotechnology II
Credit: 2 | Lecture: 0 | Lab: 4
Will focus on describing latest techniques of molecular biology and proteomics, including chromatographic separations of proteins, His-tagged protein an Ni-column purification, design and analysis of dual expression plasmids, RTPCR, 2–D gel electrophoresis and mass spectrometry analysis of proteins, yeast two-hybrid assay.
Prerequisites: BIOT 5021

BIOT 5231 Advanced Mammalian Tissue Culture
Credit: 3 | Lecture: 3 | Lab: 0
Advanced training in the Culture of Mammalian cells. Students will perform laboratories in co-immunoprecipitation assays, western blots, mammalian two-hybrid assays, etc.
Prerequisites: BIOL 4355 or Mammalian Tissue Culture experience.

BIOT 5235 Bacterial Taxonomy and Biotechnology Laboratory
Credit: 3 | Lecture: 2 | Lab: 2
This is an advanced laboratory intensive course that will emphasize methods on the isolation of quality bacterial DNA, PCR amplification, cloning and transformation, restriction fragment length polymorphism (RFLP) analysis, degrading gradient gel electrophoresis (DGGE), big dye sequencing and bioinformatics data analysis. Graduate level data reporting, analysis and laboratory reports will be required.
Prerequisites: BIOT 5011 and BIOT 5021.

BIOT 5331 Stem Cell Biotechnology
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to provide students with a thorough introduction to the current knowledge in stem cell biology. Current state of embryonic and adult stem cells research, disease treatment and the future research trends. Students will generate a NIH based mini-based proposal that stimulates their ability to make a hypothesis and generate specific aims that address this hypothesis. Students will learn how to evaluate a journal paper in stem biology and discuss the pros and cons of that paper.
BIOT 5431 Genomic Analysis  
Credit: 3 | Lecture: 3  
Students will acquire a knowledge of genomic structure and methods to perform analysis of genetic variation in different organisms. Sub-topics will include marker development that includes AFLP, RFLP, RAPD, SSCP and CAPS. Students will learn how these types of markers are used to genotype different organisms. Assignments will include lectures, laboratory marker analysis, research proposal and oral presentation.  
Prerequisites: BIOL 4341, Molecular Biology or Genetics

BIOT 5433 Marine Biotechnology Seminar  
Credit: 3 | Lecture: 3  
Students will focus on acquiring scientific literacy skills on the topic of marine biotechnology. Sub-topics will include marine natural products, seafood forensics, biofuels, biomaterials, biosensors and aquaculture. Assignments will include journal clubs, laboratory demonstrations, research proposal and oral presentation.

BIOT 5530 Research Methods in Biotechnology  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will develop a research proposal, which allows integrating knowledge and standard procedures in a chosen area of Biotechnology. A written research proposal and oral presentation will be required.

BIOT 5535 Environmental Biotechnology  
Credit: 3 | Lecture: 3 | Lab: 0  
This course introduces the variety of biotechnology used to improve our environment. Topics include biological wastewater treatment processes, biological stoichiometry, nutrients control, composting processes, biological energy production, biodegradation, and phytoremediation of toxic pollutants. The primary focus will be on biological degradation of organic compounds. Emerging technologies will be also discussed.

BIOT 5733 Bioinformatics  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the tools and sequence databases for genomic and transcriptomic data.  
Prerequisites: BIOL 4351 or equivalent.

BIOT 5736 Bioethics  
Credit: 3 | Lecture: 3  
Study of complex situations in Biology, Biotechnology and Medicine that require moral reflection, judgment or decisions.  
Prerequisites: General Biology.

BIOT 5833 Proteomics  
Credit: 3 | Lecture: 3  
Analysis of gene function of mRNA expression profiling with cDNA arrays, protein interactions by genome–side two hybrid screening and more direct analysis of protein expression, sequence and structure.  
Prerequisites: Molecular Biology.
BIOT 5915 Cooperative Education Work Term
Credit: 1 | Lecture: 1 | Lab: 0
Educational paid work assignment by a student in the field of his/her career interest and course of study. Technical report will be required at the end of the semester.

Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

BIOT 5919 Independent Study in Biotechnology
Credit: 1 | Lecture: 1 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

BIOT 5921 Laboratory Topics in Biotechnology
Credit: 2 | Lecture: 1 | Lab: 2
Identified by specific title each time laboratory is offered.

BIOT 5929 Independent Study in Biotechnology
Credit: 2 | Lecture: 2 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

BIOT 5931 Research Topics in Biotechnology
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered

BIOT 5933 Laboratory Topics in Biotechnology
Credit: 3 | Lecture: 2 | Lab: 2
Identified by specific title each time laboratory is offered.

BIOT 5939 Independent Study in Biotechnology
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

BIOT 6011 Biotechnology Practicum
Credit: 1 | Lecture: 1 | Lab: 0
Practical experience at an off-campus facility such as biotechnology company or research lab. Requires pre-acceptance interview and offer letter from employer, minimum of 10, 20 or 30 hours per week and instructor approval.

BIOT 6021 Biotechnology Practicum
Credit: 2 | Lecture: 2 | Lab: 0
Practical experience at an off-campus facility such as biotechnology company or research lab. Requires pre-acceptance interview and offer letter from employer, minimum of 10, 20 or 30 hours per week and instructor approval.

BIOT 6031 Biotechnology Practicum
Credit: 3 | Lecture: 3 | Lab: 0
Practical experience at an off-campus facility such as biotechnology company or research lab. Requires pre-acceptance interview and offer letter from employer, minimum of 10, 20 or 30 hours per week and instructor approval.

BIOT 6838 Research Project and Seminar
Credit: 3 | Lecture: 3 | Lab: 0
Students will complete a study of the current literature, including methodology and techniques used in a chosen area of Biotechnology. A written review paper and oral presentation will be required

Prerequisites: 24 hours completed in approved graduate program.

BIOT 6939 Master's Thesis Research
Credit: 3 | Lecture: 3
Prerequisites: Approval of adviser, master's committee and dean
BIOT 6969 Master's Thesis Research
Credit: 6 | Lecture: 6 | Lab: 0
Prerequisites: Approval of adviser, master's committee and dean.

BSCI Behavioral Sciences

BSCI 5931 Research Topics in Behavioral Sciences
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

BSCI 5939 Independent Study in Behavioral Sciences
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

BSCI 6739 Graduate Internship
Credit: 3 | Lecture: 0 | Lab: 0
Internship as a capstone experience for graduate students.
Prerequisites: 24 hours of graduate-level coursework and approval of internship coordinator. Students seeking an internship must have completed PSYC 5135 and, if in a Human Services internship, must have completed PSYC 5134. Arrangements for internships should be completed by the beginning of the prior semester.

BSCI 6839 Master's Project Research
Credit: 3 | Lecture: 0 | Lab: 0
Capstone project for Behavioral Science students. Approval of adviser, project director, and department chair required.

BSCI 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Capstone thesis for Behavioral Science students. Approval of adviser, thesis director, and department chair required.

CENG Computer Engineering

CENG 2112 Laboratory for Digital Circuits
Credit: 1 | Lab: 3
Laboratory experiments using digital logic and small scale integrated circuits.
Corequisites: CENG 2312

CENG 2312 Digital Circuits
Credit: 3 | Lecture: 3
Applications of point set theory and Boolean Algebra to the analysis and design of asynchronous and synchronous digital circuits.
Prerequisites: MATH 2414, PHYS 2326, PHYS 2126
Corequisites: CENG 2112

CENG 2371 Microcontroller Programming
Credit: 3 | Lecture: 3
Microcontroller, assembly language programming and embedded system applications.
Prerequisites: CSCI 1320 or equivalent.

CENG 3151 Laboratory for Computer Architecture
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory experiments for Computer Architecture Design and Interfacing.
Prerequisites: CENG 2312, CENG 2112
Corequisites: CENG 3351
CENG 3316 Electronics  
Credit: 3 | Lecture: 3  
The course is a study of the physical behavior of electronic devices. Emphasis is on analysis and application of electronic circuits utilizing semiconductor diodes, operational amplifiers, BJT and FET transistors. EDA tools are used to reinforce the theory through electronic analysis simulations.  
Prerequisites: CENG 3313  
Corequisites: CENG 3116

CENG 3351 Computer Architecture  
Credit: 3 | Lecture: 3  
Control logic, addressing, registers, instructions, memory units, arithmetic elements, interrupts and input–output structures.  
Prerequisites: CENG 2371 or CSCI 2331.  
Corequisites: CENG 3151

CENG 4313 Microprocessor Interfacing  
Credit: 3 | Lecture: 3  
Techniques for interfacing microcomputers to peripherals, memory and other devices.  
Prerequisites: CENG 3351, CENG 2371  
Corequisites: CENG 4113

CENG 4331 Analysis and Design of Linear Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
Continuous and discrete time systems. Fourier, Laplace and z-transforms and transfer functions. Introduction to digital signal processing and digital filter design using conventional and convolutional techniques, applications from communications and control theory. Computer solutions using MATLAB.  
Prerequisites: CENG 3313 and CENG 3316

CENG 4354 Digital System Design  
Credit: 3 | Lecture: 3  
Combinational and sequential circuit design of digital systems using a hardware description language. Laboratory instruction.  
Prerequisites: CENG 2312 or equivalent.

CENG 5131 Engineering Applications  
Credit: 3 | Lecture: 3  
Study of modern engineering techniques emphasizing mathematical methods currently used in industry. The MATLAB software package will be used for problem solving.  
Prerequisites: CENG 4331 or equivalent.

CENG 5133 Computer Architecture Design  
Credit: 3 | Lecture: 3  
Study of combinational and sequential digital circuit design techniques, digital building blocks, software and hardware aspects of computer architecture and memory systems.  
Prerequisites: CENG 2312 or equivalent.

CENG 5331 Theory of Information and Coding  
Credit: 3 | Lecture: 3  
Shannon's theory of information and coding applied to discrete communications channels; theory of finite fields applied to error detection and correction codes.  
Prerequisites: Background in digital logic, statistics and linear systems analysis.

CENG 5332 Wireless Communications and Networks  
Credit: 3 | Lecture: 3 | Lab: 0  
Wireless digital communication/network fundamentals, design approaches, system architectures, applications, performance assessment and security for radio frequency communication technologies.  
Prerequisites: CENG 4311 or equivalent.
CENG 5334 Fault Tolerant Computing  
**Credit: 3 | Lecture: 3**  
Lectures and research projects involving: design techniques for fault tolerant computers; fault modes; failure mechanisms; failure, fault and error relationship; architectural and software options for fault tolerance; modeling and evaluation techniques.  
*Prerequisites: Background in probability, computer hardware and computer software.*

CENG 5335 Digital Systems Testing  
**Credit: 3 | Lecture: 3**  
Digital system fault modeling and diagnosis; test synthesis, design for test, functional testing, built-in self test; discussions of real world practical applications, cost effective techniques and industry standards.  
*Prerequisites: CENG 4354 or equivalent.*

CENG 5336 Functional Verification of Digital Systems  
**Credit: 3 | Lecture: 3**  
The course discusses the concepts and practice of functional verification of digital systems using a hardware description language. Topics covered include behavioral models, checker implementation, testbench generation, report generation, and functional coverage.  
*Prerequisites: CENG 4354 and CENG 3351 or their equivalents.*

CENG 5337 Low Power System Design  
**Credit: 3 | Lecture: 3**  
Design of low power digital circuits, processors and systems; analysis of real world low power RISC processors; discussion of next generation power management and energy generation techniques.  
*Prerequisites: CENG 3351 or equivalent.*

CENG 5338 VLSI Design  
**Credit: 3 | Lecture: 3**  
The course trains students to design and analyze digital circuits incorporating into a VLSI chip. Students study design concepts and constraints such as functionality, performance, power, area, and cost; and work in small groups to bring design components together into a full custom chip.  
*Prerequisites: CENG 3351, CENG 4354, CENG 3316 or their equivalents.*

CENG 5431 Digital Signal Processing  
**Credit: 3 | Lecture: 3**  
Sampling, Fourier analysis, FFT's and digital filtering. Laboratory instruction.  
*Prerequisites: CENG 5131 or equivalent.*

CENG 5432 Digital Control Systems  
**Credit: 3 | Lecture: 3**  
Analysis and synthesis of digital control systems and a comparison of continuous and discrete control systems. Laboratory instructions.  
*Prerequisites: CENG 5131 or equivalent.*

CENG 5433 Principles of Digital Communications Systems  
**Credit: 3 | Lecture: 3**  
The course covers information theory, data compression, scalar and vector quantization, sampling, channel coding, modeling and system design for wireless communication.  
*Prerequisites: CENG 4331 and STAT 3334 or equivalent.*
CENG 5434 Microcomputer Systems Design
Credit: 3 | Lecture: 3
System design and use of the latest microcomputers, microcontrollers, specialty controller chips, and single-board computers as used in modern computer systems and products. A project assignment allows students to explore designs in their areas of interest.
Prerequisites: CENG 3351 and CENG 2371.

CENG 5435 Robotics and ROS
Credit: 3 | Lecture: 3
This class will teach the most modern techniques for design of robotic applications using the Robot Operating System (ROS) with examples such as “Baxter” a two-arm manipulator robot and TurtleBot the mobile robot. Students will have hands-on experience with a number of robots and their simulators.

CENG 5436 Computer Vision and Applications
Credit: 3 | Lecture: 3
This course provides an introduction to computer vision including fundamentals of image formation, camera imaging geometry, feature detection and matching, multi-view geometry including stereo, motion estimation and tracking, and classification. Basic methods are developed that include finding known models in images, depth recovery from stereo, camera calibration, image stabilization, automated alignment, tracking, and action recognition. Problem sets and projects include robotic applications.
Prerequisites: CENG 5131

CENG 5437 Mobile Robots
Credit: 3 | Lecture: 3
The course presents a study of techniques applied to the design and application of mobile robots. The purpose is to introduce the students to the use of robots and the techniques necessary to design and develop or specify hardware and software for applications. Students will have hands-on experience with several examples of mobile robots including flying robots.

CENG 5531 Machine Learning and Applications
Credit: 3 | Lecture: 3
Fundamentals of machine learning and pattern recognition. Topics covered include neural networks, Bayesian inference and non-parametric techniques.
Prerequisites: STAT 3334.

CENG 5532 Tele-Medicine
Credit: 3 | Lecture: 3
This course focuses on the transmission of medical data over wireless networks and addresses different techniques to process medical data. The course introduces various topics such as medical informatics, electronic health records, personal health record, healthcare information system that need to be considered for supporting healthcare services with current technology.
Prerequisites: CENG 5131. Knowledge of wireless communications and signal processing.

CENG 5533 Quantum Computing
Credit: 3 | Lecture: 3
Quantum computing, theory and annealing techniques for complex problem solving & optimization.
Prerequisites: CENG 3351, MATH 2305, MATH 2315, MATH 2318 and STAT 3334.
CENG 5534 Advanced Digital System Design  
Credit: 3 | Lecture: 3  
Behavioral and structural design methods and examples using hardware description languages, including control, arithmetic, bus systems, memory systems and logic synthesis from hardware descriptions.  
Prerequisites: CENG 5133.

CENG 5535 Wireless Sensor Networks  
Credit: 3 | Lecture: 3  
The course discusses the theory and practice of today’s wireless sensor networks and systems that consist of many tiny, low-power devices with sensing, computing, and wireless communication capabilities. The course covers sensor hardware, WSN operating system, wireless communication, networking protocols, WSN security, and intelligent algorithms.  
Prerequisites: CENG 3331 or equivalent.

CENG 5536 Applications of Parallel Computing  
Credit: 3 | Lecture: 3  
Efficient and Productive parallel programming techniques for parallel multi-core and cluster computers.  
Prerequisites: CENG 3351 and MATH 2318.

CENG 5537 Scalable Many-Core Computing  
Credit: 3 | Lecture: 3  
Algorithm/modeling techniques and computational thinking skills (using OpenCL/CUDA/OpenMP4.x/OpenACC) for scalable, many-core/many-thread processor accelerator (MIC/GPU/DSP/FPGA) programming.  
Prerequisites: CENG 3351 and MATH 2318.

CENG 5534 Digital Image Processing  
Credit: 3 | Lecture: 3  
This course introduces the fundamental of digital images and emphasizes general principles of image processing. The course covers image acquisition, image sampling and quantization, intensity transformations and spatial filtering, filtering in the frequency domain, image restoration and reconstruction, color image processing, wavelet and multiresolution processing, image compression, morphological image processing, segmentation, image representation, and object recognition.  
Prerequisites: Knowledge of probability, linear algebra and linear systems.

CENG 5634 Artificial Neural Networks  
Credit: 3 | Lecture: 3  
Artificial neural network (ANN) models and computing techniques, emphasizing on rationale, theory, modeling, analysis, methodology, evaluation, capabilities, limitations and applications of ANN.  
Prerequisites: CENG 3351, MATH 2318, MATH 2305 and STAT 3334.

CENG 5719 Internship in Computer Engineering  
Credit: 1 | Lecture: 1  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: Approval by adviser and associate dean.
CENG 5729 Internship in Computer Engineering  
Credit: 2 | Lecture: 2  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
*Prerequisites: Approval by adviser and associate dean.*

CENG 5739 Internship in Computer Engineering  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
*Prerequisites: Approval by adviser and associate dean.*

CENG 5915 Cooperative Education Work Term  
Credit: 1 | Lecture: 1  
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)  
*Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.*

CENG 5919 Independent Study in Computer Engineering  
Credit: 1 | Lecture: 1  
*Prerequisites: Approval of instructor, chair and associate dean.*

CENG 5929 Independent Study in Computer Engineering  
Credit: 2 | Lecture: 2  
*Prerequisites: Approval of instructor, chair and associate dean.*

CENG 5931 Research Topics in Computer Engineering  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

CENG 5939 Independent Study in Computer Engineering  
Credit: 3 | Lecture: 3  
*Prerequisites: Approval of instructor, chair and associate dean.*

CENG 6332 High Performance Computer Architecture  
Credit: 3 | Lecture: 3  
Processor microarchitecture, memory systems and consistency, multiprocessor systems, interconnection networks, chip multiprocessors.  
*Prerequisites: CENG 5133*

CENG 6431 DSP Implementations  
Credit: 3 | Lecture: 3  
Implementation techniques of digital signal processing applications emphasizing digital signal processors.  
*Prerequisites: CENG 5431.*

CENG 6432 Bio-Medical Signal Processing  
Credit: 3 | Lecture: 3  
This course covers fundamental concepts of biomedical signal processing. Various detection and estimation techniques and filtering are covered. Harmonic process, linear discrimination, linear mixtures, PCA, ICA, and hidden markov model are emphasized.  
*Prerequisites: CENG 5131. Knowledge of probability and signal processing.*
CENG 6532 Parallel Processing  
Credit: 3 | Lecture: 3  
Integrated discussion of the software and hardware design issues involved in parallel processing. Laboratory instruction.  
Prerequisites: Background in computer architecture and programming.

CENG 6533 Robotics  
Credit: 3 | Lecture: 3  
Topics of current interest in robotics applied to the study of mechanical systems for robots, robotics control and sensors for robotics. Laboratory instruction.

CENG 6534 Digital Systems Synthesis and Optimization  
Credit: 3 | Lecture: 3  
Digital circuits and models; scheduling algorithms, resource sharing and binding; logic level synthesis and optimization; discussions of latest trends in digital systems using recent research findings.  
Prerequisites: CENG 4354 or equivalent.

CENG 6535 Bio-Inspired Computing  
Lecture: 3  
Novel problem solving and optimization research projects that require integrating nature, bio-inspired computing knowledge to design, adapt and implement solutions for complex real-life problems.  
Prerequisites: CENG 3351, MATH 2318, MATH 2305 and STAT 3334.

CENG 6838 Research Project and Seminar  
Credit: 3 | Lecture: 3  
Students will be assigned a research project which requires integrating knowledge and standard procedures in the discipline. A written paper and a presentation will be required.  
Prerequisites: 24 hours completed in graduate program.

CENG 6939 Master's Thesis Research  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of adviser, master's committee and dean.

CHEM Chemistry

CHEM 1111 Laboratory for General Chemistry I  
Credit: 1 | Lecture: 0 | Lab: 1  
Basic laboratory experiments supporting theoretical principles presented in CHEM 1311; introduction of the scientific method, experimental design, data collection and analysis and preparation of laboratory reports. Credit may not be received for both CHEM 1105 and CHEM 1111.  
Corequisites: CHEM 1311

CHEM 1112 Laboratory for General Chemistry II  
Credit: 1 | Lecture: 0 | Lab: 1  
Basic laboratory experiments supporting theoretical principles presented in CHEM 1312; introduction of the scientific method, experimental design, chemical instrumentation, data collection and analysis and preparation of laboratory reports.  
Corequisites: CHEM 1312
CHEM 1311 General Chemistry I
Credit: 3 | Lecture: 3
Fundamental principles of Chemistry for majors in sciences, health sciences and engineering; topics include inorganic, organic, biochemistry, chemical reactions, states of matter and properties, chemical bonding, structure and descriptive chemistry.

CHEM 1312 General Chemistry II
Credit: 3 | Lecture: 3
Chemical equilibrium; phase diagrams and spectrometry; acid–base concepts; thermodynamics; kinetics; electrochemistry; nuclear chemistry; an introduction to organic chemistry and descriptive inorganic chemistry.
Prerequisites: CHEM 1311

CHEM 2123 Laboratory for Organic Chemistry I
Credit: 1 | Lecture: 0 | Lab: 1
Basic techniques and procedures in isolation, purification and characterization of organic compounds and simple reactions used in the organic chemistry lab.
Prerequisites: CHEM 1311, CHEM 1312

CHEM 2125 Laboratory for Organic Chemistry II
Credit: 1 | Lecture: 0 | Lab: 1
Extension of CHEM 2123; building from basic procedures and lab techniques to a more advanced level.
Prerequisites: CHEM 1311, CHEM 2123

CHEM 2323 Organic Chemistry I
Credit: 3 | Lecture: 3
Study of properties and behavior of hydrocarbon compounds and their derivatives. Designed for students in science or pre-professional programs.
Prerequisites: CHEM 1311, CHEM 1312

CHEM 2325 Organic Chemistry II
Credit: 3 | Lecture: 3
Continuation of properties and behavior of hydrocarbon compounds and their derivatives. Designed for students in science or pre-professional programs.
Prerequisites: CHEM 1311, CHEM 2323

CHEM 4251 Laboratory for Environmental Analysis
Credit: 2 | Lecture: 1 | Lab: 3
Experimental methods for sampling and analysis of environmental samples using modern instruments. Hands-on laboratory and field experiments. One hour of lecture and 3 hours of laboratory per week.
Prerequisites: CHEM 3333 or corequisite

CHEM 4356 Soil & Groundwater Remediation
Credit: 3 | Lecture: 3
Chemical, biological, geological principles and applications of various remediation techniques commonly used to clean up contaminated soils and groundwater.
Prerequisites: CHEM 3333.

CHEM 5130 Mathematical Methods and Physical Concepts in Chemistry
Credit: 3 | Lecture: 3
Prepares chemistry graduate students for math and physics concepts they will encounter in graduate physical chemistry courses.
Prerequisites: CHEM 4321, CHEM 4322.
CHEM 5132 Principles of Chemical Engineering
Credit: 3 | Lecture: 3
This course will provide students with a clear overview of the field of chemical engineering in which chemical engineers and chemists work cooperatively to bring laboratory discoveries into new products and technologies in various industries such as petroleum refining and petrochemical production, plastics, synthetic fibers and textiles and pharmaceuticals, etc.

CHEM 5133 Spectroscopic Identification of Organic Compounds
Credit: 3 | Lecture: 3
Theory and practice of structure determination using IR, UV-VIS, NMR and MS techniques. Lecture and laboratory instruction.
Prerequisites: CHEM 2323, CHEM 2325.

CHEM 5134 Synthetic Organic Chemistry
Credit: 3 | Lecture: 3
Modern synthetic methods used in organic chemical synthesis. A mechanistic approach is used.
Prerequisites: CHEM 2323, CHEM 2325.

CHEM 5235 Kinetics and Thermodynamics
Credit: 3 | Lecture: 3
The study of chemical bonding and structure as applied to practical chemical problems.
Prerequisites: CHEM 4321, CHEM 4322 or equivalent and MATH 2414 or CHEM 5130.

CHEM 5332 Advanced Instrumental Analysis
Credit: 3 | Lecture: 3
Advanced discussion of instrumental analytical techniques, such as optical (UV-Vis, fluorescence, circular dichroism, IR, Raman) spectroscopy, chromatography (GC, HPLC), mass spectrometry, and materials characterization techniques.
Prerequisites: CHEM 4367 or instructor's consent.

CHEM 5335 Advanced Inorganic Chemistry
Credit: 3 | Lecture: 3
The comprehensive study of the theory and properties of compounds containing the main groups of elements in the periodic table.
Prerequisites: CHEM 4335 or equivalent.

CHEM 5336 Organometallic Chemistry
Credit: 3 | Lecture: 3
Systematic study of the compounds containing a carbon-metal bond. Synthesis, structural types and typical reactions of both main group and transition metal compounds are discussed.
Prerequisites: CHEM 2323, CHEM 2325.

CHEM 5337 Physical Organic Chemistry
Credit: 3 | Lecture: 3
Advanced study of the relationships between structure and reactivity of mechanisms operating during organic chemical transformations.
Prerequisites: CHEM 2323, CHEM 2325.
CHEM 5431 Contaminant Fate and Transport
Credit: 3 | Lecture: 3
Principles of contaminant behavior in the environment. Case studies on important toxic chemicals including heavy metals, petroleum hydrocarbons, soap and detergents, pesticides, and polycyclic aromatic hydrocarbons. Suitable for non-majors.
Prerequisites: CHEM 3333 or equivalent.

CHEM 5535 Sampling & Analysis of Environmental Contaminants
Credit: 3 | Lecture: 3
Field sampling techniques, US EPA/OSHA/USGS/ASTM standard methodology, field and lab quality assurance/quality control (QA/QC), wet chemical methods and instrumentations for the analysis of environmental contaminants.
Prerequisites: STAT 3308.

CHEM 5536 Environmental Remediation
Credit: 3 | Lecture: 3
Soil and groundwater pollutant sources, types, migration; chemical and hydrogeological site characterization; chemical/biological/thermal technologies (pump-and-treat, vapor extraction, bioremediation and incineration) for the remediation of contaminated sites such as Superfund sites, landfills, brownfields, leaking storage tanks and oil spills.
Prerequisites: CHEM 3333 or equivalent.

CHEM 5631 Environmental Chemodynamics
Credit: 3 | Lecture: 3
Focus on the kinetic and thermodynamic mechanisms for chemical movement across air/soil, soil/water, water/sediment and water/air interfaces and how natural processes affect movement of chemicals in air, water, sediment and soil; information vital to performing human and ecological risk assessments.
Prerequisites: CHEM 3333.

CHEM 5633 Astrobiochemistry I
Credit: 3 | Lecture: 3
Origin of the universe, the chemical elements, the Earth and life, including pre-biotic chemistry. The nature of the first replicators, origin of the genetic code and the origin of biomolecular chirality.
Prerequisites: CHEM 1311, CHEM 1312.

CHEM 5634 Astrobiochemistry II
Credit: 3 | Lecture: 3
The search for life in the universe, including chemistry of habitable planets, chemical signatures of life on other planets in the solar system and beyond and the Search for Extra-Terrestrial Intelligence.
Prerequisites: CHEM 5633.

CHEM 5635 Advanced Polymer Chemistry
Credit: 3 | Lecture: 3
Introduction to the chemistry, structure and properties of polymers.
Prerequisites: CHEM 2323, CHEM 2325.
CHEM 5636 Advanced Analytical Chemistry  
Credit: 3 | Lecture: 3  
Advanced discussion of instrumental analytical techniques, such as optical (UV-Vis, fluorescence, circular dichroism, IR, Raman) spectroscopy, chromatography (GC, HPLC), mass spectrometry, and materials characterization techniques.  
Prerequisites: CHEM 4367 or approval of instructor.

CHEM 5637 Modern Spectroscopy  
Credit: 3 | Lecture: 3  
Theory and application of spectroscopy including modern laser techniques.  
Prerequisites: CHEM 2325, CHEM 2323, CHEM 4321, and CHEM 5130 or instructor's approval.

CHEM 5638 Total Synthesis of Natural Products  
Credit: 3 | Lecture: 3  
a mechanistic-based approach to the total synthesis of organic natural products.  
Prerequisites: Approval of instructor.

CHEM 5639 Symmetry in Chemistry  
Credit: 3 | Lecture: 3  
Applications of group theory in physical, inorganic and organic chemistry.  
Prerequisites: CHEM 2323, CHEM 2325; CHEM 4321, CHEM 4322, CHEM 4335 and CHEM 5130 or approval of instructor.

CHEM 5731 Environmental Organic Chemistry  
Credit: 3 | Lecture: 3  
Examine fundamental molecular processes of environmental organic contaminants in natural and engineered systems. Topics include equilibrium partitioning (air-water-soil-biota), sorption to soils and sediments and transformation processes (oxidation, reduction, hydrolysis, photolysis, biodegradation).  
Prerequisites: CHEM 3333, CHEM 3320.

CHEM 5739 Internship in Chemistry  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: Approval by adviser and associate dean.

CHEM 5915 Cooperative Education Work Term  
Credit: 1 | Lecture: 1  
Educational paid work assignment by a student in the field of career interest and course of study. A technical report is required at the end of the semester. (Specific requirements are noted in the Cooperative Education catalog description.)  
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

CHEM 5919 Independent Study in Chemistry  
Credit: 1 | Lecture: 1  
Prerequisites: Approval of instructor, chair and associate dean required.

CHEM 5931 Research Topics in Chemistry  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

CHEM 5939 Independent Study in Chemistry  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean required.

CHEM 6731 Graduate Seminar  
Credit: 3 | Lecture: 3  
Advanced seminar where an in-depth perusal of a chemical topic shall be undertaken and a research proposal and formal presentation shall be completed.
CHEM 6837 Research Project and Seminar I  
Credit: 3 | Lecture: 3  
Students will develop a research proposal which allows integrating knowledge and standard procedures in the discipline. A written paper and a presentation will be required.  
*Prerequisites: Admission to graduate program in chemistry.*

CHEM 6838 Research Project and Seminar II  
Credit: 3 | Lecture: 3  
Students will develop a research proposal which allows integrating knowledge and standard procedures in the discipline. A written paper and a presentation will be required.  
*Prerequisites: CHEM 6837 and 24 hours completed in approved graduate program.*

CHEM 6939 Master's Thesis Research  
Credit: 3 | Lecture: 3  
*Prerequisites: Approval of faculty adviser, master's committee and dean.*

CINF Computer Information Systems

CINF 3331 Business Data Communications  
Credit: 3 | Lecture: 3  
Introduction to business data communications. WANs, LANs and Internet concepts. A survey of data communications with emphasis on the impact of digital technology on the operation, management and economics of computer information systems.  
*Prerequisites: CSCI 1470*

CINF 4324 Modern System Analysis and Design  
Credit: 3 | Lecture: 3  
Key concepts and principles of system analysis and design within the context of information system development. Emphasis on the application of tools and techniques along with the role and responsibilities of the systems analyst as well as the systems project manager.  
*Prerequisites: CINF 3321*

CINF 5231 Strategic Information Systems  
Credit: 3 | Lecture: 3  
Key concepts, theories, and frameworks in strategic utilization of information systems solutions to help businesses compete in the global economy. Focus on the organizational, social, ethical, and legal issues associated with information technologies.

CINF 5234 Advanced Systems Analysis and Design  
Credit: 3 | Lecture: 3 | Lab: 0  
Key concepts and principles of the advanced systems analysis and design. Techniques, methods and tools of the systems analysis and design. Current issues of modern systems analysis and design in business areas.
CINF 5432 Data Warehousing and Business Intelligence
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on giving students a broad overview of managerial, strategic, and technical issues associated with Data Warehousing and Business Intelligence. Topics will cover Data Warehouse design, implementation and utilization including the principles of dimensional data modeling, techniques for ETL, data staging and quality, data warehouse architecture and infrastructure and the various methods for information delivery. The course will also introduce students to the development and use of Business Intelligence solutions that provide useful information to organization decision makers.
Prerequisites: CSCI 4333 or equivalent.

CINF 5915 Cooperative Education Work Term
Credit: 1 | Lecture: 1 | Lab: 0
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

CINF 5919 Independent Study in Computer Information Systems
Credit: 1 | Lecture: 1 | Lab: 0
Prerequisites: Approval of instructor, division chair and associate dean.

CINF 5929 Independent Study in Computer Information Systems
Credit: 2 | Lecture: 2 | Lab: 0
Prerequisites: Approval of instructor, division chair and associate dean.

CINF 5931 Research Topics in Computer Information Systems
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered.

CINF 5939 Independent Study in Computer Information Systems
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor, division chair and associate dean.

CINF 6838 Research Project and Seminar
Credit: 3 | Lecture: 3 | Lab: 0
Attendance at the orientation meeting on the first class day required. Students will be assigned a research project which requires integrating knowledge and standard procedures in the discipline. A written paper and a presentation will be required.
Prerequisites: 24 hours completed in graduate program.

CINF 6939 Master's Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of faculty adviser, master's committee and Dean.
COMM Communication

COMM 4322 Public Relations Writing
Credit: 3 | Lecture: 3 | Lab: 0
Professional approach to crafting messages that build mutually beneficial relationships between organizations and their constituents. Includes press releases, public service announcements, newsletters, brochures, speeches, and social media.
Prerequisites: COMM 3320 and COMM 3321 or equivalent.

COMM 4354 Video Production I
Credit: 3 | Lecture: 3 | Lab: 0
This course is an introduction to the basics of video production, including camera work, capturing video and sound using DSLR and traditional video cameras, working with lights, fundamental story-telling and interview skills as well as basic non-linear editing skills using either Premiere Pro or Final Cut X. A portion of the course will also be dedicated to the basics of Studio-Based Video Production. (Cross-listed with DMST 5534.)

COMM 4355 Video Production 2
Credit: 3 | Lecture: 3 | Lab: 0
This class requires basic video production skills. The students will hone their production skills and work towards a worthwhile video portfolio. The class will partly be taught in a production studio giving ample opportunity to work on Studio-Based video projects. (Cross-listed with DMST 5535.)

COMM 4391 Selected Topics in Communication
Credit: 3 | Lecture: 3 | Lab: 0
Identified by a specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

COUN Counseling

COUN 5010 Professional Preparation Seminar
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to assist students in the School Counselor certification program to understand the state certification standards for successful entry into their chosen educational fields. Completion of this course is dependent upon candidates passing all state assessments required for their degree/certification plans.
Prerequisites: Admission to the Counseling program, COUN 5131, COUN 5231, COUN 5432, COUN 6532, COUN 6534, COUN 6639, and an approved, signed degree or certification plan on file in the COE.

COUN 5034 Community Collaboration in Counseling
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the establishment of partnerships and recognition of community resources to meet the needs of diverse populations. Field experiences required.
Prerequisites: Admission to the Counseling program.
COUN 5035 Advanced Interpersonal Skills in Diverse Settings  
Credit: 3 | Lecture: 3  
This course will examine the implications of cross-cultural differences and similarities as well as the enhancement of interpersonal counseling skills required for professionals working within a diverse setting. Field experiences required.  
Prerequisites: COUN 6030 and COUN 6435.

COUN 5131 Counseling for Lifespan Development  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses topics of lifespan development within a cultural framework, including biological, neurological, physiological, and environmental factors of human development; theories of learning and resilience; effects of addiction on lifespan; and differential interventions.  
Prerequisites: Admission to the Counseling program.

COUN 5231 Professional Orientation to Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
The course includes an exploration of the history, philosophy, trends, education, licensure/certification, and practice of clinical mental health counselor and school counselor including the impact of technology, clinical supervision, advocacy efforts and self care on counseling; and other related professional issues.  
Prerequisites: Admission to the Counseling program.

COUN 5234 Career Development and Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a review of career development theories, and strategies for ethically, culturally, and developmentally appropriate career development and assessment throughout the lifespan.  
Prerequisites: Admission to the Counseling program.

COUN 5334 Counseling and Spirituality  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is an experiential and didactic investigation of the body of knowledge and practice that reflects fully the integrity, uniqueness and wholeness of a person. The content of the course is designed to foster the connection between the professional literature and the self as spiritual journeyer and clinician. The processes of the course will facilitate integrating spiritual and clinical orientations.  
Prerequisites: Admission to the Counseling program.

COUN 5335 Stress and Wellness  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will explore the interaction of stress and environment on individual and group wellbeing using a multi-faceted model of stress that incorporates an understanding of the interplay of physiology, psychology, culture and environment in producing states of health and its counterpart: dis-ease.  
Prerequisites: Admission to the Counseling program.

COUN 5432 Theories of Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
This course pertains to current theories of counseling and their applications to practice.  
Prerequisites: Admission to the Counseling program.
COUN 5433 Counseling Ethics and Consultation  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This class covers ethical, legal, and professional issues in counseling including consultation, peer intervention programs, court-referred clients, third party reimbursement and record keeping.  
*Prerequisites: Admission to the Counseling program*

COUN 5534 Child and Adolescent Counseling  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course will include major theories and interventions in counseling children and adolescents in schools and community settings. Topics include expressive, behavioral, and cognitive models of counseling for children and adolescents under regular and crisis conditions, parent and other significant adult involvement through consultation, and issues in multicultural counseling for this population.

COUN 5535 Systems Counseling  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course will offer students in the counseling field the opportunity to study the various theoretical approaches to couples and family counseling. Satisfactory completion of this course will provide students with the fundamental understanding of the various issues and dynamics involved in working with families and extended family systems in the counseling environment. Cultural issues will be incorporated into the course as well.  
*Prerequisites: Admission to the Counseling program.*

COUN 5536 Addictions Counseling  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course includes the neurobiological and medical foundation and etiology of addiction and co-occuring disorders; addictions counseling including but not limited to gambling, sex, food, alcohol, or drug; and basic concepts of terminology, models, ethical issues, substance classifications, effects and associated dangers, assessment, diagnosis, and treatment planning with both adults and children.  
*Prerequisites: Admission to the Counseling program; COUN 5433*

COUN 5630 Abnormal Human Behavior  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course will include principles of understanding dysfunction in human behavior and social disorganization.  
*Prerequisites: Admission to the Counseling Program.*

COUN 5931 Topics in Counseling  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Identified by specific title each time course is offered.  
*Prerequisites: Admission to the Counseling program, COUN 5131 and COUN 5231*

COUN 5939 Independent Study in Counseling  
**Credit: 3 | Lecture: 3 | Lab: 0**  
*Prerequisites: Approval of instructor and Associate Dean.*

COUN 6030 Multicultural Foundations for Counselors  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course will review the social, cultural, and legal issues related to counseling diverse populations in the United States.  
*Prerequisites: Admission to the Counseling program and COUN 5433*
COUN 6031 Technology Applications for Counselors  
Credit: 3 | Lecture: 3 | Lab: 0  
This course instructs the counselor on using computers and related programs/software to facilitate research, communication, reports, and presentations for counselors.  
*Prerequisites: Admission to the Counseling program.*

COUN 6032 Statistics and Measurement for Counselors  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will examine both formal and informal procedures for collecting and analyzing data, principles of measurement, and descriptive statistics.  
*Prerequisites: Admission to the Counseling program.*

COUN 6033 Research Design and Analysis for Counselors  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will enable the counselor to design, analyze, and apply counseling research techniques, both qualitative and quantitative.  
*Prerequisites: Admission to the Counseling Program*

COUN 6232 Assessment Issues for Counselors  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides the historical perspective of assessment; basic statistical concepts of testing; culturally and ethically relevant assessment strategies for selecting, administering, and interpreting assessment; and report writing.  
*Prerequisites: Admission to the Counseling program, COUN 5433 and COUN 6030*

COUN 6435 Pre-Practicum in Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
This is a pre-practicum development of advanced counseling skills and case management documents in a supervised setting.  
*Prerequisites: Admission to the Counseling program, COUN 5131, COUN 5231, COUN 5432, COUN 5433, and COUN 6030*

COUN 6531 Mental Health and Psychopathology  
Credit: 3 | Lecture: 3 | Lab: 0  
The course covers the etiology, nomenclature, treatment, referral, and prevention of mental and emotional disorders. This includes the diagnostic process and classifications from the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD), indications and contradictions of commonly prescribed psychopharmacological medications for appropriate medical referral and consultation.  
*Prerequisites: Admission to the Counseling program, COUN 5131, COUN 5432, COUN 5433, and COUN 6030*

COUN 6532 Group Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the basic principles of group dynamics, processes, theoretical applications, techniques, and leadership skills in an experiential setting.  
*Prerequisites: Admission to the Counseling program, COUN 5131, COUN 5231, COUN 5432, COUN 5344, COUN 6030, and COUN 6435*
COUN 6533 Crisis Intervention
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the theory and methodology of crisis prevention and intervention, incident debriefing, violence prevention, and development of crisis intervention teams.
**Prerequisites:** Admission to the Counseling program, COUN 5131, COUN 5432, COUN 5433, COUN 6030, and COUN 6435

COUN 6534 Developmental School Counseling Programs
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses the design, implementation and evaluation of developmental school counseling programs, with emphasis on the counselor's role in counseling, consultation, and coordination of student services in the domains of developmental guidance, individual planning, responsive services, and system support.
**Prerequisites:** Admission to the Counseling program, COUN 5131, COUN 5231, COUN 5234, COUN 5432, COUN 5433, COUN 5534, COUN 6030, COUN 6232, COUN 6435, and COUN 6532

COUN 6537 Bilingual Counseling
Credit: 3 | Lecture: 3 | Lab: 0
Students will gain an understanding of the psycho-social issues associated with counseling recent immigrants and first generation Spanish-English bilingual clients and become prepared to counsel this population using their native language, Spanish. Course is taught in Spanish and English.
**Prerequisites:** Admission to the Counseling program, COUN 6030, COUN 6435, COUN 6532, and fluency in Spanish.

COUN 6538 Social Justice Counseling
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to provide candidates with theoretical and practical foundations for understanding the role of counselor-as-advocate in social justice counseling, especially related to issues surrounding marginalized populations.
**Prerequisites:** Admission to the Counseling program, COUN 5131 and COUN 6030

COUN 6639 Counseling Practicum I
Credit: 3 | Lecture: 3 | Lab: 0
This course is restricted to students with degree or certification plans in counseling. Students will counsel bona fide clients in a supervised setting. Application to the Counseling Program for field experience is required.
**Prerequisites:** Admission to the Counseling program, COUN 5131, COUN 5231, COUN 5234, COUN 5432, COUN 5433, COUN 6030, COUN 6232, COUN 6435, COUN 6532, successful audit, and an approved, signed degree or certificate plan on file in the COE.
COUN 6738 CMHC Practicum II  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is restricted to students with degree or certification plans in counseling. Practicum II is a field experience under supervision in an approved clinical counseling setting. Students are required to earn a minimum of 300 clock hours of supervised counseling experience in a role and setting with clients relevant to clinical mental health counseling, including 120 hours of direct service with clients and 180 hours of indirect service. Audio/video recordings and/or live supervision of students' interactions with clients are required.  
**Prerequisites:** Admission to the Counseling program, COUN 6531, COUN 6639, grade of B- or higher, successful audit, and an approved, signed degree or certificate plan on file in the COE.

COUN 6739 School Counseling Practicum II  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is restricted to students with degree or certification plans in counseling. It is a supervised internship in an approved counseling environment. Written and oral reports are required. Application to the Counseling Program for field experience is required.  
**Prerequisites:** Admission to the Counseling program, COUN 6534, COUN 6639, grade of B- or higher, successful audit, and an approved, signed degree or certificate plan on file in the COE.

COUN 6838 CMHC Practicum III  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Practicum III is an advanced field experience under supervision in an approved clinical counseling setting. Students are required to earn a minimum of 300 clock hours of supervised counseling experience in a role and setting with clients relevant to clinical mental health counseling, including 120 hours of direct service with clients and 180 hours of indirect service. Audio/video recordings and/or live supervision of students' interactions with clients are required.  
**Prerequisites:** Admission to the Counseling program, COUN 6738, grade of B- or higher, successful audit and an approved, signed degree or certificate plan on file in the COE.

COUN 6839 School Counseling Practicum III  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is a continuation of COUN 6739. It is a supervised internship in an approved counseling environment. Written and oral reports are required. Restricted to students with degree or certification plans in counseling. Application to the Counseling Program for field experience is required.  
**Prerequisites:** Admission to the Counseling program, COUN 6739, grade of B- or better, successful audit, and an approved, signed degree or certificate plan on file in the COE.
CRCL Cross-Cultural Studies

CRCL 5031 Theories of Cultural Diversity
Credit: 3 | Lecture: 3 | Lab: 0
Theoretical approaches to cultural interpretation and methods of cultural comparison. Emphasis on cultural diversity as expressed in formations of nationalism, ethnicity, race, class, family, and gender; and roots of racism and tolerance.

CRCL 5033 Religion and Community
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the nature of religious experience from a comparative perspective. Basic belief, ritual, and institutional structures of major world faiths with attention to the operation of religious communities in multicultural settings. (Cross-listed with SOCI 5236.)

CRCL 5035 Health and Human Rights
Credit: 3 | Lecture: 3 | Lab: 0
Examines methods, theories, debates, and case studies related to human rights in the U.S. and globally; students will gain skills required to conduct future research on the topic.

CRCL 5037 Theories and Practices of Mediation
Credit: 3 | Lecture: 3 | Lab: 0
Application of mediation techniques to the needs of community groups, churches, businesses, and non-governmental agencies.

CRCL 5131 Gender, Culture, and Power
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of the many ways gender is constructed cross-culturally. Examination of how different societies conceptualize genders and assign them social, economic, and political significance. Analysis of relationship between and among gender and class, race, ethnicity, and nationality.

CRCL 5132 Women of Color
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the experiences of women of color in the United States and globally using race, class, and sexuality as analytical tools to explore these experiences.

CRCL 5232 Cultures of Mexico and Central America
Credit: 3 | Lecture: 3 | Lab: 0
Survey of anthropological approaches to societies of Mexico, Central America, and the U.S.-Mexico border. Students will be exposed to methods, theories, and case studies and will gain skills required to conduct future research on the topic.

CRCL 5330 Cultural Study Abroad
Credit: 3 | Lecture: 3 | Lab: 0
Students will be exposed to theories, methods, and case studies of a foreign nation; students will conduct research on a specific topic. Topics vary; course may be repeated with permission of instructor.

CRCL 5332 Diversity in Urban America
Credit: 3 | Lecture: 3 | Lab: 0
Examination of classical theories of urban life and urban development; exploration of urban issues such as ethnic diversity, transportation, and policy.
CRCL 5333 Minorities and Majorities  
Credit: 3 | Lecture: 3 | Lab: 0  
The pattern of interaction among race, ethnic, and gender groups; personality and structural effects of prejudice and discrimination. Includes both U.S. and cross-cultural perspectives.

CRCL 5531 Families, Communities, and Diversity  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of ideas of family, race, gender, and relatedness in transnational and cross-cultural perspectives. Draws on case studies from anthropology and other fields.

CRCL 5533 Community Health in Cross-Cultural Perspective  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores the history and status of community health as well as the cultural and social determinants of health in a cross-cultural perspective.

CRCL 5535 Cultures of Asia  
Credit: 3 | Lecture: 3 | Lab: 0  
Anthropological approaches to Asian societies.

CRCL 5538 Cultures of the Middle East  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of anthropological and other approaches to understanding societies of the Middle East. Students will be exposed to methods, theories, and case studies and will gain skills required to conduct future research on the topic.

CRCL 5631 Qualitative Research Methods  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of methods used in a variety of disciplines to study differences based on culture, race, ethnicity, gender, class, and nationality.

CRCL 5732 U.S. Social Movements  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis and comparison of ideology, composition, and social role of such reform movements as abolitionism, civil rights, feminism, labor unions, populism, progressivism, and socialism. Topics vary; may be repeated for credit with permission of instructor.

CRCL 5733 Program Seminar: Contemporary Issues in Cross-Cultural Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
In-depth exploration of a specific topic in Cross-Cultural Studies. Students will engage in research as part of the course. Topics vary; may be repeated for credit with permission of instructor.

CRCL 5734 Cross-Cultural Texts in Dialogue  
Credit: 3 | Lecture: 3 | Lab: 0  
Texts representing First-World colonialism and imperialism (e.g., _Heart of Darkness_, _Passage to India_, _Robinson Crusoe_) are read in dialogue with corresponding texts from perspective of the colonized (e.g., _Things Fall Apart_, _Midnight's Children_, _Lucy_); includes postcolonial poetry and theory.

CRCL 5931 Research Topics in Cross-Cultural Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

CRCL 5939 Independent Study in Cross-Cultural Studies  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.
CRCL 6739 Graduate Internship
Credit: 3 | Lecture: 0 | Lab: 0
Minimum of two days a week in an approved internship setting. Written report required. Arrangements for internships should be completed by the beginning of the prior semester.
Prerequisites: 24 hours of graduate-level coursework and approval of internship coordinator.

CRCL 6839 Master's Project Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, project director, and department chair required.

CRCL 6909 Cross-Cultural Studies
Comprehensive Exam
Credit: 0 | Lecture: 0 | Lab: 0
Comprehensive exam for students following coursework option resulting in a research proposal or a written examination.
Prerequisites: 30 hours of coursework.

CRCL 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, thesis director, and department chair required.

CRIM 5036 Criminological Research and Statistics I
Credit: 3 | Lecture: 3 | Lab: 1
Design, analysis, and application of criminological research techniques and methods of measurement.

CRIM 5037 Criminological Research and Statistics II
Credit: 3 | Lecture: 3 | Lab: 1
Further examination of procedures involved in designing and analyzing criminological research.
Prerequisites: CRIM 5036.

CRIM 5133 Advanced Juvenile Delinquency
Credit: 3 | Lecture: 3 | Lab: 0
In-depth analysis of delinquency theories, issues, and policies in the U.S. and abroad. Topics include measurement and research, serious violent offenders, gangs, and treatment by justice agencies. (Cross-listed with SOCI 5133.)

CRIM 5135 The Death Penalty
Credit: 3 | Lecture: 3 | Lab: 0
History and development of capital punishment as a criminal justice remedy. Focuses on process and issues such as deterrence and discrimination as related to the execution of violent offenders. (Cross-listed with SOCI 5135.)

CRIM 5136 Race and Crime
Credit: 3 | Lecture: 3 | Lab: 0
Historical and social understanding of racial and ethnic groups in the United States as related to causation of crime and involvement in the criminal justice system.

CRIM 5138 Homeland Security
Credit: 3 | Lecture: 3 | Lab: 0
Examination of events before, during, and after September 11, 2001, in order to prepare for future manmade and natural catastrophic threats to homeland security.
CRIM 5139 Correctional Institutions  
Credit: 3 | Lecture: 3 | Lab: 0  
An advanced, theoretical examination of both prisons and jails as total institutions. Includes history of prisons, various philosophies of incarceration, organizational structure, institutional subcultures, and problems encountered in the classification and supervision of incarcerated offenders.

CRIM 5331 Advanced Criminology  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of major theories of crime causation. Emphasis on sociological theories of social structure, social process, and social conflict along with classical and neoclassical perspectives. (Cross-listed with SOCI 5331.)

CRIM 5335 Criminal Justice and the Mass Media  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of collision between two powerful sets of social institutions: the criminal justice system and the mass media. (Cross-listed with SOCI 5335.)

CRIM 5336 Law and Society  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of a number of problematic issues in contemporary American society from the perspectives of sociological, philosophical, and legal theories. Course examines the controversial ways the U.S. political system seeks to reconcile individual liberties with collective obligations of the social contract. (Cross-listed with SOCI 5336.)

CRIM 5338 Criminal Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of structure and rationale for criminal law; focus on criminal liability, criminal defenses, and types of offenses. (Cross-listed with CRIM 4334, SOCI 4334, and SOCI 5338.)

CRIM 5339 Comparative Criminology  
Credit: 3 | Lecture: 3 | Lab: 0  
Comparative study of criminology and institutions of social control in selected Western and non-Western countries.

CRIM 5431 Domestic Violence  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of historical and contextual foundations, theories of causation and victimization, legal and enforcement responsibility, and potential solutions to abuse and violence in domestic relationships.

CRIM 5432 Culture of Law Enforcement  
Credit: 3 | Lecture: 3 | Lab: 0  
Critical analysis of the culture of U.S. policing as it relates to the roles, functions, and family.

CRIM 5433 Serial Murder  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of phenomenon of serial murder on national and international bases. Discussions include current and historical serial killers and why they kill as well as case studies and their investigation.

CRIM 5931 Research Topics in Criminology  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by a specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.
CRIM 5939 Independent Study in Criminology
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

CRIM 6734 Future of Crime and Justice
Credit: 3 | Lecture: 3 | Lab: 0
Behavioral perspective on possible and probable futures and their impact on U.S. society and the criminal justice system. Emphasis on socioeconomic and technological factors and trends currently shaping crime in America.

CRIM 6735 Seminar in Criminology
Credit: 3 | Lecture: 3 | Lab: 0
Fulfills coursework option requirement in graduate criminology. Students apply the substantive knowledge and research skills they have acquired to topic selected by instructor.
Prerequisites: CRIM 5036, CRIM 5037, 24 hours of graduate-level coursework.

CRIM 6739 Graduate Internship
Credit: 3 | Lecture: 0 | Lab: 0
Minimum of two days a week in approved internship setting. Written report required. Arrangements for internship should be completed by beginning of prior semester.
Prerequisites: 24 hours of graduate-level coursework and approval of internship coordinator.

CRIM 6839 Master's Project Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, project director, and department chair required.

CRIM 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, thesis director, and department chair required.

CSCI Computer Science

CSCI 1320 C Programming
Credit: 3 | Lecture: 3
Programming techniques with the C programming language, emphasis on modular design, data abstraction and encapsulation using ANSI C. Use of all features of C including arrays, pointers, structures, prototypes, separate compilation and the C-preprocessor. Development of generic functions and study of portability issues.

CSCI 1370 Software Development with Java
Credit: 3 | Lecture: 3
Programming with an object-oriented programming language, Java. Uses iteration, selection, recursion, exception handling, data structures and file I/O. Introduction of Object-oriented programming concepts such as reuse, data abstraction, classes, inheritance, polymorphism, exception handling and UML to build robust code and enhance problem solving methodology. May be used in the place of CS2.
Prerequisites: CSCI 1320 or CSCI 1470.

CSCI 1470 Computer Science I
Credit: 4 | Lecture: 4
Introduction to computer programming using Python. Topics include: design tools (flowcharts, pseudocode) control flow statements (if, while, for), simple arithmetic expressions, input and output statements, functions, data structures including strings and lists, text files. Introduction to software development life cycle and testing. The course is programming-intensive with in-class assignments and weekly homework and a final project. Introduction to Arduino and number systems.
CSCI 1471 Computer Science II  
Credit: 4 | Lecture: 4  
Build upon basic programming concepts using Java constructs such as iteration, selection, recursion, exception handling, data structures and file I/O. Introduce Object-oriented programming concepts including: reuse principles, data abstraction, classes, inheritance, polymorphism, exception handling and UML to build robust code and enhance problem solving methodology.  
**Prerequisites:** CSCI 1320 or CSCI 140

CSCI 2315 Data Structures  
Credit: 3 | Lecture: 3  
Advanced programming techniques and data structures including arrays, linked lists, queues and stacks; abstract data types, recursion, searching and sorting, binary trees, hashing techniques, elementary algorithm design and analysis, and more.  
**Prerequisites:** (CSCI 1320 and CSCI 1370) or CSCI 1471

CSCI 2331 Computer Organization & Assembly Language  
Credit: 3 | Lecture: 3  
Basic elements of computer hardware and software, data representations, instruction formats and addressing modes, assembly language instructions, programming techniques in assembly language, macro assemblers, link- loaders, functions of operating systems and input/output programming and peripherals. Laboratory instruction.

CSCI 3303 Fundamentals of Programming  
Credit: 3 | Lecture: 3  
This course will build on basic script programming knowledge. Topics will include: problem solving using built-in functions and lambdas; data structures such as lists, tuples, sets, and dictionaries; comprehensions and generators; visualization; and processing data using databases and files including binary, text, and CSV files, etc. Students will work with Python. Laboratory instruction. Open to non-CS majors only.  
**Prerequisites:** ITEC 2313, CSCI 1470 or instructor approval.

CSCI 3311 Programming With Visual Basic  
Credit: 3 | Lecture: 3  
Programming with Visual Basic with emphasis on object-oriented programming and the uses of integrated development environments. Data types, control structures, functions and subroutines, files, classes, controls. Development using the .NET framework. Laboratory instruction. Open to non-majors only.

CSCI 3321 Numerical Methods  
Credit: 3 | Lecture: 3  
**Prerequisites:** MATH 2318, MATH 2320, CSCI 1471 or both CSCI 1320 and CSCI 1370
CSCI 3352 Advanced Data Structures and Algorithms  
Credit: 3 | Lecture: 3
Binary trees, trees, graph theory, finite state automata, external storage devices, sequential and direct file organizations, file processing techniques, hashing, B-trees, external sorting, P and NP problems, algorithmic analysis. Laboratory instruction.  
Prerequisites: CSCI 2315, MATH 2305, MATH 2414, PHYS 2325 and PHYS 2326.

CSCI 4320 Web Application Development  
Credit: 3 | Lecture: 3
Prerequisites: CSCI 2315.

CSCI 4333 Design of Database Systems  
Credit: 3 | Lecture: 3
Design of database systems, data description and manipulation languages, data models, entity-relationship model, relational model, SL, relational algebra, normalization theory, DBMS, Internet, database design, data flow diagrams, and implementation of database systems. Laboratory instruction.  
Prerequisites: CSCI 2315

CSCI 4354 Operating Systems  
Credit: 3 | Lecture: 3
Analysis and design of basic operating systems concepts, including multiprocessing, interprocess communication and synchronization, scheduling, file systems, memory management, input/output and deadlock. Examples drawn from real operating systems including Unix and Windows NT. Laboratory instruction.  
Prerequisites: CSCI 2315, CSCI 1331, MATH 2305, MATH 2414, PHYS 2325 and PHYS 2326 and senior standing.  
Corequisites: CENG 3351

CSCI 5037 Topics in Computer Science for Non-Majors  
Lecture: 0 | Lab: 1
Identified by topics each time the course is offered. Not to be taken by majors in computing programs. Laboratory instruction.

CSCI 5130 Human Computer Interface  
Lecture: 0 | Lab: 1
This course provides students with the methods for creating and refining interfaces between humans and systems. The course explores new design methodologies, experimenting with new hardware devices, prototyping new software systems and defining new paradigms for interaction and developing models and theories of interaction.  
Prerequisites: Computer language proficiency, numerical methods and probability; linear systems analysis recommended.
CSCI 5131 Simulation Techniques  
Lecture: 0 | Lab: 1  
Modern software techniques in continuous and discrete model construction for industrial and scientific applications. Laboratory instruction.  
*Prerequisites: Computer language proficiency, numerical methods and probability, linear systems analysis recommended.*

CSCI 5132 Internet Protocols  
Lecture: 0 | Lab: 1  
Interconnection of heterogeneous networks and the layering principles of TCP/IP which make it possible. A brief look at underlying hardware technologies. Internet addressing and routing, reliable and unreliable transport protocols. Application level services available in the Internet.  
*Prerequisites: CSCI 1370 or CSCI 1471 and CSCI 2315*

CSCI 5134 Concurrent Programming and Software Modeling  
Lecture: 0 | Lab: 1  
Principles of issues related to concurrent programming and software modeling. Detailed study of Unix, Java and .NET APIs for multiprocessing, multi-threading and synchronization. Introduction to Software Modeling using UML, analysis of requirements documents to produce UML models and automatic code generation using IDE plug-ins or built-in tools. Other software development issues like unit testing and version control will also be explored. Laboratory instruction.  
*Prerequisites: An OOP Language (C++, Java or C#)*

CSCI 5232 Concepts of Programming Languages  
Lecture: 0 | Lab: 1  
The course assumes knowledge of at least one imperative language such as C, C++, or Java. Study of various programming languages from conceptual standpoint; topics will include formal language definition, data storage techniques, design techniques and implementation issues for compilers. Both numeric and string processing languages will be covered.  
*Prerequisites: CSCI 2315.*

CSCI 5233 Computer Security and Cryptography  
Credit: 3 | Lecture: 3  
Introduction to encryption and decryption; security mechanisms in computer architectures, operating systems, databases, networks and introduction to security.  
*Prerequisites: CSCI 2315.*

CSCI 5234 Web Security  
Lecture: 0 | Lab: 1  
Fundamental coverage of issues and techniques in developing secure web-based applications and related topics such as network security, web server security, application-level security and web database security, etc.  
*Prerequisites: CSCI 5233 and CSCI 4320 or instructor's approval.*

CSCI 5235 Network Security  
Lecture: 0 | Lab: 1  
Advanced cryptography, access control, distributed authentication, TCP/IP security, firewalls, IPSec, Virtual Private Networks, intrusion detection systems and advanced topics such as wireless security, identity management, etc.  
*Prerequisites: CSCI 5233 or CSCI 4323 and CSCI 5132 or CSCI 4312.*
CSCI 5331 Computer Graphics
Lecture: 0 | Lab: 1
Interactive graphics techniques, three dimensional graphics including 3-D projections, hidden line elimination and shading. Stereo graphics, Virtual Reality and Animation. Laboratory instruction.
Prerequisites: CSCI 3352, CSCI 4350 or equivalent, linear algebra and analytic geometry.

CSCI 5333 Database Management Systems
Credit: 3 | Lecture: 3 | Lab: 0
Database management systems (DBMS), relational DBMS, object-oriented DBMS, knowledge base management systems, database language, query optimization, security and integrity, concurrency control and recovery, design theory of databases. Laboratory instruction.
Prerequisites: CSCI 4333.

CSCI 5335 Artificial Intelligence
Credit: 3 | Lecture: 3
Exploring the major concepts of artificial intelligence: foundations of artificial intelligence, intelligent agents, searching, constraint satisfaction, planning, knowledge representation, uncertain knowledge and reasoning, learning, and understanding of artificial intelligence programming languages. Students who receive credit for CSCI 4335 will not receive credit for this course.

CSCI 5355 Internet of Things (IoT)
Credit: 3 | Lecture: 3
Internet of Things is becoming the largest computing platform and the emerging technology is in the process of remodeling the cyber and physical world. This course aims to introduce the current vision of Internet of Things and its impact on the world, to understand the challenges that must be addressed before IoT can be widely deployed, and to develop an appreciation of the technologies that can make IoT to become reality. Students will also get hands-on experience by working on IoT projects.
Prerequisites: CSCI 5134

CSCI 5388 Big Data Analytics
Credit: 3 | Lecture: 3
This course teaches students about the core technologies to manipulate, store, and especially to analyze big data. Students will acquire essential skills required for a typical Data Science project. In this class, we couple hands-on labs/projects with lectures/readings. The hands-on activities familiarize students with Hadoop for storage (HDFS) and Spark as computing engine. Students will learn to apply typical machine learning techniques (using Spark MLlib) and some other analytics techniques such as graph processing (using Spark GraphX) to big data. Python is the main programming language for this course.
Prerequisites: CSCI 4333 or equivalent and knowledge of Python programming
CSCI 5431 Client-Server Based Network Programming
Lecture: 0 | Lab: 1

CSCI 5432 Design and Analysis of Algorithms
Lecture: 0 | Lab: 1
Review of advanced data structures and algorithm design. Focus on analysis techniques for complex algorithms and data structures, including amortized analysis, randomized algorithms and NP approximations. Includes survey of parallel analysis and complexity theory. Prerequisites: CSCI 3352.

CSCI 5433 Object-Oriented Database Systems
Lecture: 0 | Lab: 1
Integration of object-oriented technology with database and Internet technologies, topics include modeling and design for object-oriented database systems, their development processes, implementation of online web database applications using object-oriented languages, scripting languages and object-oriented DBMS to store and retrieve objects in an object-oriented database. Laboratory instruction. Prerequisites: CSCI 4333; CSCI 4320 recommended.

CSCI 5530 Pattern Classification
Lecture: 0 | Lab: 1
Introduction to the basic concepts of pattern classification including Bayes decision theory, parametric and non-parametric techniques, linear discriminant functions and clustering. Laboratory instruction. Prerequisites: Calculus, linear algebra, probability, statistics and a compiler language.

CSCI 5531 Advanced Operating Systems
Lecture: 0 | Lab: 1
Study of current methodologies used in the design of distributed operating systems including issues related to the design of distributed file systems, interprocess communication and synchronization facilities, process, processor and memory management within the context of distributed operating systems. Case studies and review of current literature. Basic introduction to network programming and its application to the design of a simplified component of a distributed operating system. Laboratory instruction. Prerequisites: CSCI 4354 and CSCI 5134.

CSCI 5532 Pattern Recognition and Image Processing
Lecture: 0 | Lab: 1
An introduction to basic concepts and techniques for digital image processing, including software and hardware techniques for statistical pattern recognition and extracting useful information from pictures by automatic means. Laboratory instruction. Prerequisites: Calculus, linear algebra, probability, statistics and a compiler language.
CSCI 5533 Distributed Information Systems  
Lecture: 0 | Lab: 1  
Distributed transparency, distributed DBMS architecture, distributed database design, semantic data security and integrity control, distributed query processing, database interoperability, mobile databases, distributed concurrency control and recovery, distributed DBMS. Laboratory instruction.  
Prerequisites: CSCI 5333.

CSCI 5631 Foundations for Service Oriented Architectures  
Lecture: 0 | Lab: 1  
Principles and issues related to the development of interface based software components as the foundation for developing Service Oriented Architecture (SOA). Topics include interface definition and design, language integration (VB, C#, C++ and Java), concurrency and threading issues, type libraries, distributed components, call backs and persistence.  
Prerequisites: CSCI 5431 or CSCI 5531.

CSCI 5633 Web Database Development  
Lecture: 0 | Lab: 1  
Principles of design and implementation of web database systems for storing, updating and retrieving data on the web: web database development techniques, database modeling, SQL development, web database connectivity, web database application programming. Scripting languages, exchanging data with XML, user authentication, user tracking, session management, e-commerce and web database administration will be covered. Laboratory instruction.  
Prerequisites: CSCI 4320 and CSCI 4333.

CSCI 5635 Parallel Processing  
Lecture: 0 | Lab: 1  
Integrated discussion of the software and hardware design issues involved in parallel processing. Laboratory instruction.  
Prerequisites: Background in computer architecture and programming.

CSCI 5733 XML Application Development  
Lecture: 0 | Lab: 1  
XML standards including XML, DTD, DOM, XSL, XSLT, Xpath, Xpointer and XML Schema. XML related technologies including XML parsers, JAXP, XSL parsers, XML servers, XML databases, SOAP and Web services. Laboratory instruction.  
Prerequisites: CSCI 1370 or CSCI 1471, CSCI 4320.

CSCI 5737 Mobile Applications Development  
Lecture: 0 | Lab: 1  
Mobile application design and development principles—application scoping, usage patterns, reliability requirements, mobile user interface design, accessing hardware features such as camera and GPS and performance tuning. Hands-on laboratory instruction provided using one of the popular mobile platforms—iOS, Android or Windows Phone 7.  
Prerequisites: The course assumes knowledge of an object-oriented programming language such as C++, Java, C#, etc.

CSCI 5739 Internship in Computer Science  
Lecture: 0 | Lab: 1  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: Approval by adviser and associate dean.
CSCI 5832 Financial Data Mining
Lecture: 0 | Lab: 1
Examination of the process of data mining financial data in order to identify potentially successful approaches. Explores different sources of data (e.g., derivatives, stocks) and how to effectively apply various machine learners. *Prerequisites: At least one high level programming language or instructor's approval.*

CSCI 5833 Data Mining: Tools and Techniques
Lecture: 0 | Lab: 1
Overview of the data mining process (e.g., CRISP-DM) including issues of data cleansing and data modeling. Characterization of data (structured, unstructured, time series). Examination of machine learners (neural networks, decision trees, genetic programs). Critique of various data mining tools regarding functionality and application. Assessment of data mining domains using financial, bioinformatics and web-based repositories. *Prerequisites: CSCI 2315 and CSCI 4333. CSCI 5333 recommended.*

CSCI 5838 Mobile Game Programming
Lecture: 0 | Lab: 1
Mobile games design and development principles—creating game scenes, levels, and sprites, collision detection, scrolling background, sounds, leaderboard and incorporating physics in games. Hands-on laboratory instruction provided using one of the popular mobile platforms (iOS, Android or Windows Phone 7) and gaming engines such as Cocos2D, Box2D etc. *Prerequisites: CSCI 1370*

CSCI 5915 Cooperative Education Work Term
Lecture: 0 | Lab: 1
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.) *Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.*

CSCI 5919 Independent Study in Computer Science
Lecture: 0 | Lab: 1
*Prerequisites: Approval of instructor, chair and associate dean.*

CSCI 5929 Independent Study in Computer Science
Lecture: 0 | Lab: 1
*Prerequisites: Approval of instructor, chair and associate dean.*

CSCI 5931 Research Topics in Computer Science
Lecture: 0 | Lab: 1
Identified by specific title each time course is offered.
CSCI 5933 Computational Bioinformatics
Lecture: 0 | Lab: 1
Course assumes students have very little or no prior Biological background. The course examines computational approaches to understanding and predicting the structure, function, interactions and evolution of DNA, RNA, proteins and related molecules and processes. The methods taught focus on developing the structure of the models, on model fitting algorithms (machine learning) and on the application of the resulting models (data mining). Most applications will revolve around DNA, RNA, protein sequence and gene expression-array data, but other types of data may also be considered. 
Prerequisites: CSCI 5833.

CSCI 5939 Independent Study in Computer Science
Lecture: 0 | Lab: 1
Prerequisites: Approval of instructor, chair and associate dean.

CSCI 6530 Research Methods in Computer Science
Lecture: 0 | Lab: 1
A study of current methods and techniques in computer science research, including writing research proposals, conducting research, technical writing and presentations.

CSCI 6532 Real-Time Systems
Lecture: 0 | Lab: 1
Major issues in the design and implementation of predictable real-time systems including cyclic executives, fixed priority executives, dynamic priority executives, priority inversion, object-oriented design, real-time transaction systems, real-time programming languages and real-time operating systems. Laboratory instruction.
Prerequisites: Background in operating systems.

CSCI 6838 Research Project and Seminar
Lecture: 0 | Lab: 1
Attendance at the orientation meeting on the first class day required. Students will be assigned a research project which requires integrating knowledge and standard procedures in the discipline. A written paper and a presentation will be required.
Prerequisites: 24 hours completed in graduate program.

CSCI 6939 Master's Thesis Research
Lecture: 0 | Lab: 1
Prerequisites: Approval of faculty adviser, master's committee and Dean.

CSCI 6969 Master's Thesis Research
Lecture: 0 | Lab: 1
Prerequisites: Approval of faculty adviser, master's committee and Dean.
DMST Digital Media Studies

DMST 5031 Graphic Design
Credit: 3 | Lecture: 3 | Lab: 0
Professional approaches to graphic design. Presentations on design theory and practice. Professional design projects using Adobe Illustrator. Previous art, design, and/or computer skills desirable.

DMST 5033 Advertising Design
Credit: 3 | Lecture: 3 | Lab: 0
Professional approaches to advertising design, theory, and practice. Advertising design projects requiring photographic and computer skills. Previous art, design, computer, and writing skills desirable. Prerequisites: DMST 5031 or permission of instructor.

DMST 5034 Global Issues in a Digital Society
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of global issues topics articulated from theoretical and/or historical approaches as they relate to digital media (film, video, art, texts, photography, and commercial art) and/or social media platforms.

DMST 5039 Web Development
Credit: 3 | Lecture: 3 | Lab: 0
Students study function of, critically evaluate, and create Web sites. Students create and publish client-based projects. Topics include HTML, XHTML, CSS, and JavaScript. (INST 5635 may be taken as an alternative.) Prerequisites: Proficiency in Photoshop or equivalent experience with instructor approval.

DMST 5131 Game Design and Theory
Credit: 3 | Lecture: 3 | Lab: 0
A great game is a perfect fusion of science, technology, art, design and more. And unlike other forms of art, games are truly participatory and interactive experiences. When these experiences are done well, game designers are able to create a sense of flow – an intense state of concentration and focus, allowing players to solve complex problems. This course will explore how to leverage the power of this art form to produce "games for good" or "serious games."

DMST 5132 3D Modeling
Credit: 3 | Lecture: 3 | Lab: 0
3D modeling techniques for animation, images, and 3D computer sculptures. Covers surface and texture mapping and lighting. Students present research on topics related to 3D technologies.

DMST 5230 Critical Approaches to Digital Media
Credit: 3 | Lecture: 3 | Lab: 0
An exploration of visual and mass communication literacy as it relates to digital media production and creative works using the communication process with applicable theories. One cannot separate images and words when discussing digital media. Course topics will include significant scholars and researchers who have impacted the way we think about a variety of digital media.

DMST 5232 Media and Communication Research Methods
Credit: 3 | Lecture: 3 | Lab: 0
Study, apply, and evaluate qualitative, quantitative, and critical research methods employed in scholarly communication and digital media research.
DMST 5233 Digital Media Law and Ethics Seminar  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of legal and ethical issues pertinent to the professional communicator regarding issues such as information access, intellectual property, privacy, and defamation. Emphasis on regulation of new technology.

DMST 5234 Public Relations Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Writing for corporate, nonprofit, and government organizations, including press releases, public service announcements, speeches, newsletters, grants, etc. Also covers interviewing, public relations, research techniques, layout, and production.

DMST 5235 Animation  
Credit: 3 | Lecture: 3 | Lab: 0  
Fundamental principles of animation, both computer and traditional. Emphasis on 3D computer animation, editing, and compositing. Story boarding and animation project planning also covered. Students complete animated shorts and present research on 3D technologies, filmmaking, or storytelling.  
Prerequisites: DMST 5132.

DMST 5236 Digital Storytelling  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction in the basic structure of digital narratives such as genres and theory for various forms of digital media storytelling. Students will create their own narratives using visual, script, genre, story boards and proposals/pitches for a final production.  
Prerequisites: Must have completed any mandated courses for enrollment.

DMST 5330 Strategic Campaign Planning  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to teach you how to think like a public relations professional. To do so, the course emphasizes the preparation of problem-solving campaigns, programs, and projects. Students will implement the four-step public relations process in the form of the group and individual proposals. Students will be expected to apply skills in critical thinking, numeracy, writing, reading, research, and new technologies. (Cross-listed with COMM 4323.)  
Prerequisites: DMST major, COMM 3320 or permission of instructor.

DMST 5332 Motion Graphics  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the principles of motion design. Processes, techniques, and theories of motion graphics and compositing as they pertain to the integration of typography, imagery, sound, motion, and narrative to create an animated product. Includes project planning, production, and postproduction.

DMST 5333 Social Media  
Credit: 3 | Lecture: 3 | Lab: 0  
Draws from a range of social theory to critically evaluate the impact of social media on news media, relationships, social change, branding, and politics.

DMST 5436 Interactive Animation  
Credit: 3 | Lecture: 3 | Lab: 0  
Instruction in 2D animation, Timeline and Objects, Action Script, user interactivity, and publishing files. Students study function of and evaluate animations as communication vehicles.  
Prerequisites: DMST 5031 and COMM 4434 or equivalent experience with instructor approval.
DMST 5437 Digital Media and Society
Credit: 3 | Lecture: 3 | Lab: 0
To pose and discuss questions, ideas, and debates related to digital media technologies and the impact on individuals, society, and the culture.

DMST 5534 Video Production 1
Credit: 3 | Lecture: 3 | Lab: 0
This class teaches the basic nuts and bolts of video production, including capturing video and sound using DSLR and traditional video cameras, working with lights, fundamental story-telling and interview skills as well as basic non-linear editing skills using either Premiere Pro or Final Cut X. Emphasis will also be placed on conceptual and analytical skills. (Cross-listed with COMM 4354.)

DMST 5535 Narrative Video Production
Credit: 3 | Lecture: 3 | Lab: 0
This class requires fundamental knowledge and skills in video production. It gives students ample opportunity to hone their skills and put together a worthwhile video portfolio. The class will also include the opportunity for studio-based video production projects. (Cross-listed with COMM 4355.)

DMST 5536 Studio-Based Video Production
Credit: 3 | Lecture: 3 | Lab: 0
This course will teach the basics of Studio-Based TV Production, including lighting, set design, camera operation, hosting, directing, switching, audio recording, and stage directing. (Cross-listed with COMM 4359.)

DMST 5537 Documentary Video Production
Credit: 3 | Lecture: 3 | Lab: 0
This class teaches documentary video production skills, including the proper use of production equipment, emphasizing the complexity of developing story lines, and honing effective interpersonal communication skills. Students will also learn the complex logistical tasks involved in creating a compelling documentary. (Cross-listed with COMM 4357.)

DMST 5538 Electronic Publishing
Credit: 3 | Lecture: 3 | Lab: 0
Instruction in design, layout, project management, printing, and electronic publication. Principles, techniques, and theories of typography, photography, illustration, and color to express messages for specific audiences. New trends in publication and automation also included.

DMST 5931 Research Topics in Digital Media Studies
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor. DMST adviser permission required.

DMST 5939 Independent Study in Digital Media Studies
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.
DMST 6639 Practicum in Public Relations  
Credit: 3 | Lecture: 0 | Lab: 0  
Application of public relations theory and research including in-depth best practices case studies with real world applications such as PR campaign. This course is suggested as a precursor for the PR internship course.  
*Prerequisites: DMST Core (DMST 5031 and DMST 5230) and DMST 5234, DMST 5831.*

DMST 6739 Graduate Internship  
Credit: 3 | Lecture: 0 | Lab: 0  
Development of digital media under supervision of selected professor and on-site organizational supervisor. 500 on-site hours required. Includes the production of a professional portfolio. Completed over two semesters.

DMST 6769 Graduate Internship  
Credit: 6 | Lecture: 0 | Lab: 0  
Development of digital media under supervision of selected professor and on-site organizational supervisor. 500 on-site hours required. Includes the production of a professional portfolio. Completed over one semester.

DMST 6839 Master's Project Research  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of adviser, project director, and department chair required.  
*Prerequisites: 24 hours of DMST.*

DMST 6909 Master's Exam Option  
Credit: 0 | Lecture: 0 | Lab: 0  
Capstone Exam Option. Requires approval of adviser and department chair, with two additional pre-approved advanced courses (6 hours) and testing or additional work to test out of a capstone thesis, project, or internship.  
*Prerequisites: All previous coursework must be in the process of completion up to the final 6 hours.*

DMST 6939 Master’s Thesis  
Credit: 3 | Lecture: 0 | Lab: 0  
Approval of adviser, thesis director, and department chair required.  
*Prerequisites: 24 hours of DMST.*

DSCI Decision Sciences

DSCI 3321 Statistics I  
Credit: 3 | Lecture: 3  
Introduction to probability and statistics; descriptive measures, probability distribution, sample statistics, estimation, confidence intervals, tests of hypotheses, chi-square, F-distribution, linear regression and correlation  
*Prerequisites: Finite Math and Business Calculus*

DSCI 5131 Business Analytics I  
Credit: 3 | Lecture: 3 | Lab: 0  
This course introduces a variety of advanced statistical tools for improved decision making in business analytics. Topics include analysis of experimental designs; advanced multiple regression; logistic regression; discriminant, cluster, and factor analysis; nonparametric statistics; and statistical quality improvement tools. Topics will be explored using data sets, actual business scenarios, and statistical computer output.  
*Prerequisites: BAPA 5031 or FINC 5231 or equivalent.*
DSCI 5231 Business Analytics II  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on mastering data-driven quantitative modeling techniques for business decision making. Covers the process of formulating business objectives, data preparation, and partition to successfully design, build, evaluate and implement the quantitative models. Applies predictive modeling techniques, deterministic optimization, simulation, to a wide range of practical business scenarios in the areas such as finance, HR, healthcare, marketing, supply chain etc. Requires using Excel software to implement these models. Prerequisite: BAPA 5031 or FINC 5231 or equivalent  
Prerequisites: BAPA 5031 or FINC 5231 or equivalent

DSCI 5431 Management Science and Operations  
Credit: 3 | Lecture: 3 | Lab: 0  
The scientific approach to managerial decision making. An applied management science course with applications in production/operations management. The topics covered include: decision analysis; inventory, scheduling and production models; computer simulation; queuing; linear programming; project management (PERT, CPM), and forecasting.  
Prerequisites: BAPA 5031 or FINC 5231 or equivalent

DSCI 5531 Introduction to Supply Chain Management  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides an integrated view of procurement, operations, and logistics management. Students will learn how to manage the flow of products through the supply chain – from sourcing and acquisition through delivery to the customer. Processes from each functional area are integrated into one operation to satisfy the needs of the customers.  
Prerequisites: BAPA 5031 or FINC 5231 or equivalent.

DSCI 5931 Research Topics in Decision Sciences  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

DSCI 5939 Independent Studies in Decision Science  
Credit: 3 | Lecture: 3 | Lab: 0  
Independent directed study in Decision Sciences.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

ECED Early Childhood Education

ECED 1303 Children and Families  
Credit: 3 | Lecture: 3 | Lab: 0  
Social contexts in which a child develops, the relationships of individuals in these social contexts and the interaction within and between cross-cultural contexts. Field experiences required.
ECED 4302 Developing Competence in Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Focus on the relationship among the content areas, skills, concepts and practices that support early competence in young children. Integration of national and state standards into curriculum planning is featured. Field experiences required. *Prerequisites: ECED 1354, INST 3313 and TCED 4303*

ECED 4311 Reading Development in Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Focus on early language and literacy development of young children. Oral language development, beginning reading and writing strategies and family literacy are featured. Field experiences required. *Prerequisites: LLLS 4311 and LLLS 4345.*

ECED 4314 Observational/Developmental Assessment of Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Evaluation and uses of developmental and cognitive assessment instruments and their theoretical bases will be explored. Students will develop informal assessments of the intellectual, language, social, physical and motor development of young children. *Prerequisites: ECED 4302.*

ECED 5031 Teaching Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Students will explore practices that nurture the intellectual growth and general development of young children. Field experiences required.

ECED 5032 Community Programs for Young Children
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on studies of various school and community programs (and their underlying theoretical perspectives) that serve young children and families. Trends and issues in early childhood education will be explored. Field experiences required.

ECED 5033 Guidance and Classroom Management for EC–6
Credit: 3 | Lecture: 3 | Lab: 0
This course explores theories and strategies for guiding young children's behavior in classroom and non-classroom settings. Focus will be on establishing effective discipline and management strategies which promote autonomy in young children.

ECED 5038 Creative Arts in Early Childhood
Credit: 3 | Lecture: 3 | Lab: 0
This course explores the theory, content, and practice of integrating the performing arts into the curriculum design and early learning environments. Emphasis is placed on aesthetic development of young children through play, visual art, music, movement, and creative dramatics.
ECED 5039 Early Childhood Advocacy: Teachers, Parents, Schools and Community
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the importance of the role of advocacy in Early Childhood Education. The development of advocacy skills, as well as the role of advocacy with stakeholders such as parents, schools, communities, federal, state, and local governing agencies will be analyzed. Strategies for developing successful advocacy agendas will be investigated.

ECED 5131 Curriculum Development for Young Children
Credit: 3 | Lecture: 3 | Lab: 0
This course examines strategies for developing, implementing, and evaluating creative and intellectually stimulating learning environments and curricula for young children. Field experiences required.
Prerequisite: ECED 5031

ECED 5132 Literacy Development in Early Childhood
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on language and emergent literacy development including research and implications for practice. Field experiences required.

ECED 5133 Mathematics and Science Teaching and Learning in Early Childhood
Credit: 3 | Lecture: 3 | Lab: 0
This course introduces developmental theories and research about science and mathematics learning in the early years. This course also explores principles, methods, and materials for integrating and applying appropriate mathematics and science education into the early childhood curriculum.

ECED 5231 Play and the Developing Child
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on research, philosophy, and application of developmental play theory, including the influence of play on physical growth, social relationships, emotional well-being, cognitive development, and creative expression. Field experience required.

ECED 5331 Evaluation of Development of Young Children
Credit: 3 | Lecture: 3 | Lab: 0
This course is an overview of formal and informal evaluation, including authentic assessment of young children's development. Assessment models that focus on physical, social, emotional, cognitive, and language capabilities are reviewed.
Prerequisite: ECED 5031

ECED 5332 Infants and Young Children With Exceptionalities
Credit: 3 | Lecture: 3 | Lab: 0
This course is a study of various educational models and methods for the assessment and service provision to infants and young children with special needs. Field experiences required.
Prerequisites: SPED 4030 or SPED 5030

ECED 5333 Advanced Studies of Infants and Young Children With Special Needs
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses advanced studies of the education of infants and young children with disabilities to include service coordination, assistive/adaptive technologies and health care issues.
Prerequisites: ECED 5332 or SPED 5332.
ECED 5335 Children, Family and Society  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the social contexts in which a child develops, the relationships of individuals in these social contexts, and the interaction within and between cross-cultural contexts. Field experiences required.

ECED 5336 Administration and Management of Programs for Young Children  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the principles of management and administration applied to early care and education programs with an emphasis on human resources, ethics, accreditation, legal concerns, and program evaluation.

ECED 5737 Practicum: Infants and Young Children With Disabilities  
Credit: 3 | Lecture: 3 | Lab: 0  
This course consists of fieldwork with infants and/or young children with disabilities not limited to school, agency, or privately funded programs.  
Prerequisites: ECED 5332/SPED 5332 and ECED 5333/SPED 5333.

ECED 5931 Research Topics in Early Childhood Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

ECED 5939 Independent Study in Early Childhood Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

ECED 6739 Early Childhood Education Practicum  
Credit: 3 | Lecture: 3 | Lab: 0  
Supervised internship in an early childhood setting.  
Prerequisites: Completion of a minimum of nine hours of the professional education core and 15 ECED hours which include the ECED Core: ECED 5031, ECED 5131, ECED 5132, and approval of the associate dean.

ECON Economics

ECON 5136 Managerial Economics  
Credit: 3 | Lecture: 3 | Lab: 0  
Application of microeconomics theory to managerial decision making. Topics may include demand analysis, cost analysis, market structure and their relation to pricing, product choice, resource allocation and industrial organization.

ECON 5137 Economics of Energy  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides an economic analysis of national and international energy markets, including coal, oil, natural gas and alternatives. Scope includes energy market evolution and current market structures, pricing, capital requirements, consumption and production spillovers and regulation. Cross-listed with ENVR 5331.
EDCI Education in Curriculum and Instruction

EDCI 7031 Quantitative Research I
Credit: 3 | Lecture: 3 | Lab: 0
This is the first of a two-course sequence (with EDCI 7032) and focuses on quantitative techniques of inquiry that pertain to educational research. Using an integrated approach, students will study statistics; exploratory data analysis; sampling, survey and experimental design; and interview and questionnaire design. Topics include inferential, descriptive, comparative, relational and non-parametric statistics.
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course number.

EDCI 7032 Quantitative Research II
Credit: 3 | Lecture: 3 | Lab: 0
This is the second of a two-course sequence (with EDCI 7031) and focuses on quantitative techniques of inquiry that pertain to educational research and policy analysis. Using an integrated approach, students may study statistics, exploratory data analysis, sampling, survey, and experimental design. Topics include descriptive and inferential (parametric and non-parametric) statistics.
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7033 Qualitative Research
Credit: 3 | Lecture: 3 | Lab: 0
This course is an introduction to qualitative methods of research. It serves as an introduction to the terminology, historical development, and variety of approaches of qualitative methods. Students will gain practical experience with qualitative methods of data collection and analysis. Students may study many of the same topics discussed in EDCI 7031 & 7032 from a qualitative perspective.
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.
EDCI 7034 Professional Writing and Communications  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses public writing and presentation skills. The course begins with the study of creating case studies as well as reading, interpreting, and discussing case studies. Part 2 would focus on dissertation writing and other textual forms including press releases, speeches, newsletters, and grants. Part 3 would focus on developing skills for speaking and listening effectively with different audiences, as well as the effective use of technology and presentations. Part 4 would focus on managing interactions with the media, e.g., interviews for print, radio, and television. Teaching strategies would include case studies, readings, simulations, and skills development experiences.  
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7035 Intercultural Communications  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the understanding of cultural issues that influence communication effectiveness with diverse populations.  
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7137 Advanced Models of Teaching STEM Education  
Credit: 3 | Lecture: 3 | Lab: 0  
In this course, students examine a variety of teaching models to extend their existing knowledge base of instructional strategies. Focus on examination will be on the following Models of Teaching: Concept Attainment, Inquiry Training, Synectics, Advanced Organizers, Project-Based Learning, Professional Learning Communities, Non-Directive Teaching, Group Investigation, Role Playing, and Simulation.  
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7138 Curriculum Design: Development, Implementation, Evaluation in STEM Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will examine the impact of 21st-Century National Standards on the development, implementation, and evaluation of state and local curricula to facilitate STEM integration into classrooms.  
Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.
EDCI 7139 Professional Development Principles and Practices
Credit: 3 | Lecture: 3 | Lab: 0
This course examines current research-based strategies and techniques, e.g., workplace improvement goals development, assessment models, motivational methods, and skills transferability, for the effective planning and implementation of professional development programs.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7331 Advanced Qualitative Methods
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on analysis techniques beyond the constant comparative method. Discussion of system-level analysis and means of analyses useful for studies examining micro- and macro-level phenomena. Exposure to several advanced qualitative methodologies, including life history, arts-based research, qualitative evaluation, and discourse analysis.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7333 Survey Design
Credit: 3 | Lecture: 3 | Lab: 0
Development, construction, and validation of non-cognitive questionnaires, surveys, and interview protocols. Item construction, analysis, and the development of subscales are discussed. Effects of sampling methodologies are examined. Survey environment selection effects will be discussed. Review recent research on survey design with a focus on response rate improvement.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7430 Current Issues and Trends in STEM Education
Credit: 3 | Lecture: 3 | Lab: 0
This course is in a seminar format, and exposes students to the current research, issues, and trends in STEM education. Students will self-select recent journal articles related to their individual research agendas, identify specific research areas, and prepare literature reviews.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.
EDCI 7431 Learning and Cognition in STEM Education  
Credit: 3 | Lecture: 3 | Lab: 0  
In this course, students will review seminal research regarding learning and cognition in STEM education. Students will also examine their own epistemological and ontological perspective as they begin to explore the theoretical framework that will undergird their research.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7530 Learning Theory and Instruction  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on salient characteristics that differentiate learning environments designed with prominent contemporary theories of learning and cognitive science.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7533 Systematic Design of Technology-Based Instruction  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on application of systematic procedures for designing training and instruction based on a combination of practical experience and instructional systems design theory and research. Secondary emphasis on methods for instructional delivery, including instructor-led, print, computer, and electronic network-based systems.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.

EDCI 7535 Digital Video Production for Educators  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on "Digital Video" pre-production, production, and post-production.

Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.
EDCI 7537 Technology and eLearning  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course focuses on how technology-rich learning environments must benefit from a firm grounding in educational psychology and cognitive science. It links current understanding of human cognition with advances in computer technologies.  
*Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.*

EDCI 7538 Interactive Distance Learning  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course focuses on the systematic design and delivery of interactive distance education programs based on the use of the Internet and related telecommunication technologies.  
*Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.*

EDCI 7931 Doctoral Research Topics in Curriculum and Instruction  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Identified by specific topic each time course is offered.  
*Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.*

EDCI 7939 Doctoral Independent Study in Curriculum and Instruction  
**Credit: 3 | Lecture: 3 | Lab: 0**  
*Prerequisites: Approval of instructor and student's doctoral committee.*

EDCI 8530 Research Seminar  
**Credit: 3 | Lecture: 3 | Lab: 0**  
The main focus is on creating doctoral dissertation proposals which address current real-world problems. The process helps doctoral students develop viable research projects that could serve as relevant dissertation topics.  
*Prerequisites: Prior to enrolling in this class, candidates must be admitted to the Doctorate of Education in Curriculum and Instruction (EDCI) with an emphasis in STEM Education and/or obtain permission from the EDCI program coordinator and the course instructor.*

EDCI 8939 Dissertation  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Prerequisites: Admission to candidacy for doctoral degree and consent of Doctoral Program Committee. Once admitted to Doctoral Candidacy, the candidate may register for the dissertation course. Six (6) hours of dissertation count toward the program. The instructor of record is the student's Dissertation Chair. The "course" focuses on the activities necessary for the completion of the dissertation. The program requires continuous enrollment in the dissertation until completion.
EDCI 8969 Dissertation
Credit: 6 | Lecture: 6 | Lab: 0
Prerequisites: Admission to candidacy for doctoral degree and consent of Doctoral Program Committee. Once admitted to Doctoral Candidacy, the candidate may register for the dissertation course. Six (6) hours of dissertation count toward the program. The instructor of record is the student's Dissertation Chair. The "course" focuses on the activities necessary for the completion of the dissertation. The program requires continuous enrollment in the dissertation until completion.

EDLS Educational Leadership

EDLS 7010 Superintendent Professional Preparation Seminar
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to assist students in the superintendent certification program in understanding the state certification standards for successful entry into this educational field. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plan. Prerequisites: An approved, signed certification plan on file in the COE.

EDLS 7030 Dispute Resolution
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to analyze various approaches in resolving disputes and to develop skills in helping to resolve disputes that may occur in managing responsibilities. The elements of arbitration, mediation and negotiations are included. Materials from educational, governmental, and service organizations will be used.

EDLS 7031 Quantitative Research I
Credit: 3 | Lecture: 3 | Lab: 0
This is the first of a two-course sequence (with EDLS 7032) and focuses on quantitative techniques of inquiry that pertain to educational research and policy analysis. Using an integrated approach, students will study statistics; exploratory data analysis; sampling, survey and experimental design; naturalistic observation and inquiry; and interview and questionnaire design in the context of using research information in planning, change management, policy analysis, and program management. Topics include inferential, descriptive, comparative, relational, and non-parametric statistics.

EDLS 7032 Quantitative Research II
Credit: 3 | Lecture: 3 | Lab: 0
This is the second of a two-course sequence (with EDLS 7031) and focuses on quantitative techniques of inquiry that pertain to educational research and policy analysis. Using an integrated approach, students may study statistics, exploratory data analysis, sampling, survey, and experimental design. Topics include descriptive and inferential (parametric and non-parametric) statistics. Prerequisites: EDLS 7031
EDLS 7033 Qualitative Research
Credit: 3 | Lecture: 3 | Lab: 0
This course is an introduction to qualitative methods of research. It serves as an introduction to the terminology, historical development, and variety of approaches of qualitative methods. Students will gain practical experience with qualitative methods of data collection and analysis. Students may study many of the same topics discussed in EDLS 7031 & 7032 from a qualitative perspective.

EDLS 7034 Professional Writing & Communications
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses public writing and presentation skills. The course includes the study of creating case studies; reading, interpreting and discussing case studies; dissertation writing and other textual forms, including press releases, speeches, newsletters and grants; developing skills for speaking and listening effectively with different audiences; the effective use of technology in presentations; and managing interactions with the media, including interviews for print, radio, and television.

EDLS 7035 Intercultural Communication
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the understanding of cultural issues that influence communication effectiveness with diverse populations.

EDLS 7036 Special Populations–Early Childhood Education
Credit: 3 | Lecture: 3 | Lab: 0
This course is an overview of programs, trends, issues, policy, legal and ethical aspects, advocacy, assessment, curriculum planning, program development, and family and community resources related to early childhood education. Field experience required.

EDLS 7037 Special Populations–Special Education
Credit: 3 | Lecture: 3 | Lab: 0
This course is an overview of programs, trends, issues, policy, legal and ethical aspects, advocacy, assessment, curriculum planning, program development and evaluation, and family and community resources related to special education. Field experience required. Prerequisites: EDLS 7033 and EDLS 7130.

EDLS 7038 Special Populations–Bilingual and ESL Education
Credit: 3 | Lecture: 3 | Lab: 0
This course is an overview of programs, trends, issues, policy, legal and ethical aspects, advocacy, assessment, curriculum planning, program development and evaluation, and family community resources related to bilingual and ESL education. Field experience required.

EDLS 7039 Special Populations–Synthesis
Credit: 3 | Lecture: 3 | Lab: 0
This course will bring together collaborative knowledge and research from all three special population areas: Early Childhood Education, Special Education, and Bilingual/ESL Education. Field experience required. Prerequisites: EDLS 7034
EDLS 7130 Program Evaluation  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses the evaluation of the effectiveness of programs and policies. Topics include purposes for evaluating; evaluator's role; evaluation structure; various design applications, including experimental, quasi-experimental, and descriptive; and indicators for effectiveness and program process along with a series of components, including collection of quantitative and qualitative data, analysis, and use of evaluation results in the decision-making process.  
**Prerequisites:** EDLS 7033.

EDLS 7131 Society, Language and Reading  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the impact of linguistic, cultural, and social variables when learning to read.  
**Prerequisites:** EDLS 7035.

EDLS 7132 Integrating Reading into the Curriculum  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines current research and practice on integrating reading throughout the content area curriculum.

EDLS 7133 Writing Workshop in the Classroom I  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines research-based instructional strategies for improving writing in grades K–12.  
**Prerequisites:** Concurrent enrollment in EDLS 7134.

EDLS 7134 Curriculum Writing Workshop in the Classroom II  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines research-based instructional strategies for improving writing in grades K–12.  
**Prerequisites:** Concurrent enrollment in EDLS 7133.

EDLS 7135 Literacy Assessment for the Practitioner  
Credit: 3 | Lecture: 3 | Lab: 0  
This course teaches the assessment and diagnosis of literacy disorders, including dyslexia.  
**Prerequisites:** Six hours from EDLS 7034 or EDLS 7131–7134.

EDLS 7136 Current Pedagogical Issues  
Credit: 3 | Lecture: 3 | Lab: 0  
This course, in a seminar format, presents an analysis of current curricular and instructional issues in educational research. Course activities involve extensive review of student-selected research journal articles related to their individual research agendas.

EDLS 7137 Advanced Models of Teaching  
Credit: 3 | Lecture: 3 | Lab: 0  
In this course, students examine a variety of teaching models to extend their existing knowledge base of instructional strategies. Focus of examination will be on the following Models of Teaching: Concept Attainment, Inquiry Training, Synectics, Advance Organizers, Non-Directive Teaching, Group Investigation, Role Playing, and Simulation.
EDLS 7138 Curriculum Design: Development, Implementation, Evaluation  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will examine the impact of 21st-Century National Standards on the development, implementation, and evaluation of state and local curricula.

EDLS 7139 Professional Development Principles and Practices  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines current research–based strategies and techniques (e.g., workplace improvement goals development, assessment models, motivational methods, and skills transferability) for the effective planning and implementation of professional development programs.

EDLS 7230 Counseling Supervision  
Credit: 3 | Lecture: 3 | Lab: 0  
This course includes supervision models; supervisory relationship and counselor development; supervisory methods and techniques; group supervision; counselor evaluation using state and national counseling models; ethical, legal, cultural and professional issues of supervision; executive and administrative tasks of supervision. Field experience required.  
Prerequisites: Permission of the instructor and two years’ experience as Licensed Professional Counselor or Certified School Counselor.

EDLS 7231 Advanced Crisis and Disaster Response  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses the creation of school safety plans, preventative/responsive preparation and better prepares the counselor for dealing with a major school-wide crisis as well as ways to cope with parental, community, and media response.  
Prerequisites: Permission from instructor and COUN 6533.

EDLS 7232 Evaluating Counseling Programs  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on comparing/contrasting a district's current counseling curriculum and suggesting changes that can strengthen the district's counseling-related programs and policies.  
Prerequisites: EDLS 7130.

EDLS 7233 Counseling as a Profession  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on advanced work within the profession such as university instruction and supervision; syllabus preparation to meet state and national standards; committee work for local, state, and national professional organizations; networking with other doctoral-level counseling students; and developing skills for presenting research within a state or national forum.  
Prerequisites: Permission of instructor and certification as a School Counselor or Licensed Professional Counselor.
EDLS 7238 Marketing of Educational Services for Nonprofit Organizations
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to integrate concepts, practices, and skills for the effective marketing of services with attention to nonprofit organizations (e.g., educational entities). Through the use of readings, case studies, and projects, students will analyze environments and marketing mixes and make decisions in the development of viable educational marketing strategies.

EDLS 7330 Advanced Statistical Analysis
Credit: 3 | Lecture: 3 | Lab: 0
This is an advanced course in statistical methods. Topics may include analysis of variance techniques; planned and post hoc comparisons and mixed designs; multiple correlation/regression techniques, including polynomials, analysis of interactions, dummy coding, and analysis of covariance. Current issues in the field involving the use/misuse of statistical analysis will be discussed.
Prerequisites: EDLS 7032.

EDLS 7331 Advanced Qualitative Methods
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on analysis techniques beyond the constant comparative method. It includes the discussion of system-level analysis and means of analyses useful for studies examining micro- and macro-level phenomena, and exposure to several advanced qualitative methodologies, including life history, arts-based research, qualitative evaluation, and discourse analysis.
Prerequisites: EDLS 7033.

EDLS 7332 Current Issues in Educational Measurement
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the application of reliability, validity, and practicality to the development, selection, use, and interpretation of tests and other measuring instruments. It includes the interpretation and use of norms, standard scores, percentiles, quotients, and grade equivalents. An understanding of the role of measurement in evaluation, diagnosis, selection, and placement is included.
Prerequisites: EDLS 7032.

EDLS 7333 Survey Design
Credit: 3 | Lecture: 3 | Lab: 0
This course examines the development, construction, and validation of non-cognitive questionnaires, surveys, and interview protocols. Item construction, analysis, and the development of subscales are discussed. Effects of sampling methodologies are examined. Survey environment selection effects will be discussed. Review of recent research on survey design with a focus on response rate improvement are also discussed.
Prerequisites: EDLS 7033.

EDLS 7530 Learning Theory and Instruction
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on salient characteristics that differentiate learning environments designed with prominent contemporary theories of learning and cognitive science.
EDLS 7533 Systematic Design of Technology-based Instruction
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the application of systematic procedures for designing training and instruction based on a combination of practical experience and instructional systems design theory and research. Secondary emphasis is on methods for instructional delivery, including instructor-led print, computer, and electronic network-based systems.

EDLS 7535 Digital Video Production for Educators
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on basic "Digital Video" pre-production, production, and post-production.

EDLS 7537 Technology and eLearning
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on how technology-rich learning environments must benefit from a firm grounding in educational psychology and cognitive science. It links current understanding of human cognition with advances in computer technologies.

EDLS 7538 Interactive Distance Learning
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the systematic design and delivery of interactive distance education programs based on the use of the Internet and related telecommunication technologies.

EDLS 7636 Politics and School Finance
Credit: 3 | Lecture: 3 | Lab: 0
This course includes federal, state, and local sources of funding; issues related to the distribution of moneys and local taxation policies; understanding the concepts and issues of bond elections, investments, debt service, and risk management; analysis of the community power structure within the district; and how national and state political forces affect local education policies.

EDLS 7637 Personnel Management
Credit: 3 | Lecture: 3 | Lab: 0
This course covers the various aspects of administering personnel in the educational setting: rights and responsibilities of employees, contracts, collective bargaining, termination, advertising, recruiting, interviewing, hiring practices, staff development, and creation of policies governing personnel.

EDLS 7638 The Superintendent and School Community Relations
Credit: 3 | Lecture: 3 | Lab: 0
This course is an application of interpersonal skills in educational leadership and study of leadership approaches for use with various school constituencies.

EDLS 7833 Superintendent Seminar
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses contemporary theory and issues in school leadership.

EDLS 7837 Superintendent Practicum
Credit: 3 | Lecture: 3 | Lab: 0
This is a supervised internship in an approved educational environment. Written and oral reports are required.
EDLS 7931 Doctoral Research Topics in Educational Leadership
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific topic each time the course is offered.

EDLS 7939 Doctoral Independent Study in Educational Leadership
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and student’s doctoral committee.

EDLS 8030 Organizational Leadership
Credit: 3 | Lecture: 3 | Lab: 0
This course explores major philosophies and theories of leadership and their applications to successfully leading and managing educational organizations in community settings, especially ones with a diverse population. Topics include theories of organization and their implications for diagnosis and actions; managerial styles and their implications in addressing individual and group dynamics; values and ethics; cultural sensitivity; legal responsibilities; and effective decision-making strategies for successful outcomes. Field experience is required.
Prerequisites: EDLS 8130

EDLS 8130 Strategic Planning & Systems Alignment
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses components of systems theory, comprehensive strategic planning, and modeling and organizational alignment. Topics include developing systems analysis, strategic and unit-level planning, contingency planning, integration of planning horizontally and vertically, and alignment of planning with resources and assessment. Field experiences required.

EDLS 8131 Policy, Knowledge Management & Forecasting
Credit: 3 | Lecture: 3 | Lab: 0
This course investigates the use of data systems for organizational management and policy development. It uses techniques of knowledge management systems, data mining, and forecasting tools to effectively integrate diverse data sets such as demographics, facilities needs, planning documents, assessment data, human resource data, and financial data. Topics include the development and use of demographic models, GIS models, database design, forecasting tools, and simulation tools. Field experiences required.
Prerequisites: EDLS 8130

EDLS 8132 Transition and Change Management
Credit: 3 | Lecture: 3 | Lab: 0
This course explores the theory and research of change management as applied to enterprise-wide change, organizational transitions, and processes. Topics include analysis of the various aspects of systemic change such as change leadership, team building, process planning, accountability systems, succession management, data analysis, communication and survey tools, resource allocation, community relations, and marketing of services. Field experiences required.
EDLS 8230 Ethics, Values and Social Responsibility
Credit: 3 | Lecture: 3 | Lab: 0
This course identifies highest standards in professional collaboration, duty to stakeholders, the extent of professional responsibility extending beyond matters of designated and measurable accountability and commitment to the community served. The course merges the best of the technical literature by professional ethicists with an emphasis on practice and continuous improvement.

EDLS 8330 Human Resources Administration
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses various aspects of human resources leadership and management. Topics include federal/state laws; meaningful work environment; motivation and job satisfaction; effective and interactive employee communications; and relevant, ongoing professional development opportunities for self and for staff, highlighting lifelong learning. Discussions include the research and theory of adult learning (transformational learning), reflective practices, and mentoring. Field experiences required.

EDLS 8430 Financial Resources Management
Credit: 3 | Lecture: 3 | Lab: 0
This course addresses financial management practices and problems of nonprofit organizations in the area of education, government, and human services. Specific topics include financial accounting, preparation, and interpretation of financial statements, financial analysis and cost accounting, budgeting, cost containment and retrenchment, and financial planning. Field experiences required.

EDLS 8530 Research Seminar
Credit: 3 | Lecture: 3 | Lab: 0
This course will provide an interactive review of research methods and focus on student development of a viable dissertation research proposal.
Prerequisites: EDLS 7033. Focuses on challenging topics of leadership in educational settings.

EDLS 8630 Administration in Higher Education
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to provide an overview of leadership and management principles and theories in higher education, (i.e., universities and community colleges). Key topics will include governance structures, personnel roles and functions, communication systems, decision making processes, interpersonal relationships, curriculum development, funding, accountability, remediation, planning, and budgetary operations.

EDLS 8631 Student Affairs in Higher Education
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to provide a basic understanding of the impact of collegiate structures and environments on student development and learning. Key topics will include principles of student development, theories addressing the college student in the postsecondary setting, adult learning strategies, as well as administrative practices pertaining to recruitment, advisement, counseling, financial assistance, residential living, group organizations, and campus services.
EDLS 8632 Law and Policy in Higher Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to provide legal and policy aspects of administration in higher education. Key topics will include admissions; student rights; personnel recruitment, hiring, supervision, evaluation and career development; budgeting and control in planning; retrenchment; and property usage.  
Prerequisites: 3

EDLS 8633 Contemporary Issues in Higher Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to identify and analyze critical questions, complex topics and major trends facing higher education and to arrive at alternative solutions in effectively responding to these multifaceted issues, such as accommodating discipline-specific developments, university governance structures, diversity in higher education, state and federal funding levels, and serving evolving societal needs while preserving the tradition of higher learning.

EDLS 8939 Dissertation  
Credit: 3 | Lecture: 3 | Lab: 0  
Six (6) hours of dissertation count toward the program. This course focuses on the activities necessary for the completion of the dissertation.  
Prerequisites: Admission to candidacy for doctoral degree.

EDLS 8969 Dissertation  
Credit: 6 | Lecture: 6 | Lab: 1  
Six (6) hours of dissertation count toward the program. This course focuses on the activities necessary for the completion of the dissertation.  
Prerequisites: Admission to candidacy for doctoral degree.

EDUC Education

EDUC 4310 Theories of Educational Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
A study of major theories of learning, motivation, cognition and moral development as they apply to professionals and learners, including constraints imposed by law and social policy and tradition.

EDUC 5130 Cognition and Instruction  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will familiarize students with the theoretical foundation of cognitive psychology, the research protocols of cognitive science, and the implication of each for classroom technology and instruction.

EDUC 5931 Research Topics in Professional Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

EDUC 5939 Independent Study in Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.
EDUC 6032 Applied Statistics
Credit: 3 | Lecture: 3 | Lab: 0
This course is an application of descriptive and inferential statistics in education. It focuses on the calculation and use of measures of central tendency and variability and presents statistical tools typically used in educational research, including selected parametric and non-parametric techniques.

EDUC 6033 Research Design and Analysis
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the design, analysis, and application of educational research techniques, both qualitative and quantitative.
Prerequisites: EDUC 6032 or equivalent.

EDUC 6839 Master’s Project Research
Credit: 3 | Lecture: 3 | Lab: 0
Applied field research. May be repeated for credit.
Prerequisites: EDUC 6032 or equivalent, 21 additional hours of approved degree course work and approval of instructor and associate dean.

EDUC 6909 Master’s Comprehensive Examination
Credit: 0 | Lecture: 0 | Lab: 0
Students approved to take the Master's Comprehensive Examination and who have completed their required course work register for this course in order to take the examination.
Prerequisites: Approval of the instructor and the associate dean.

EDUC 6939 Master’s Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
May be repeated for credit.
Prerequisites: EDUC 6033 or equivalent, 21 additional hours of approved degree course work and approval of instructor and associate dean.

EMGT Engineering Management

EMGT 5035 Scientific Writing
Credit: 3 | Lecture: 3
Written English grammar and scientific writing style; access and critique of primary research literature; scientific technical report and review paper writing. This course is designed for CSE graduate students who are required to complete a course in technical writing as part of their acceptance requirement into their respective programs.
Prerequisites: Instructor approval is required.

EMGT 5130 New Business Development
Credit: 3 | Lecture: 3
The course concentrates on business proposal writing and business feasibility analysis for technology ventures.
Prerequisites: Foundation courses.

EMGT 5131 Legal Issues in Engineering Management
Credit: 3 | Lecture: 3
This course will provide an overview of warranty law, deceptive trade practices law, product liability and class action concepts. Class discussions will focus on legal considerations for engineering managers, risk assessment and the expense and adverse impact of litigation.
Prerequisites: Foundation courses.
EMGT 5230 Negotiation Strategies  
Credit: 3 | Lecture: 3  
This course will educate the student to better understand the behavior of individuals, groups and organizations in the context of competitive situations. Students develop negotiation skills experientially and understand negotiation in useful analytical frameworks.  
*Prerequisites: Foundation courses.*

EMGT 5231 Engineering Management Planning  
Credit: 3 | Lecture: 3  
This course is to provide students with the state-of-the-art issues, knowledge and skills of product design and development process in the context of the systems engineering process and management. Topics include the techniques and knowledge for new product design and development processes and their management. These include the product planning, requirements engineering, product specification, concept generation/selection and testing, product architecture and related design techniques.

EMGT 5330 Service and Operations Management  
Credit: 3 | Lecture: 3  
This course provides an overview, concepts and methods that are useful in understanding the management of firm's operations. This course will concentrate on operations strategy, process improvement, forecasting, lean and just-in-time and supply chain management.  
*Prerequisites: Foundation courses.*

EMGT 5331 Six-Sigma Quality  
Credit: 3 | Lecture: 3  
This course will cover the knowledge areas of six sigma green belt. Topics include six sigma goal, lean principles, theory of constraints, design for six sigma, quality function deployment, process management, data and process analysis and design of experiments.  
*Prerequisites: Foundation courses.*

EMGT 5430 Professional Project Management  
Credit: 3 | Lecture: 3  
This course focuses on project management through the critical examination of project defining, planning, implementing, monitoring, controlling and documenting. Includes the nine project management knowledge areas defined in the Project Management Body of Knowledge (PMBOK) issued by the Project Management Institute (PMI), project management software and techniques and skills required for good project management. The course concentrates on the production of a project management plan.  
*Prerequisites: Foundation courses.*

EMGT 5431 Contract Management  
Credit: 3 | Lecture: 3  
This course provides overall knowledge on the processes and techniques through which goods and services are acquired in the project management environment.  
*Prerequisites: Foundation courses.*
EMGT 5530 Organizational Analysis and Management
Credit: 3 | Lecture: 3
This course examines the human side of management through the application of behavioral science for technical professionals. This course focuses on decision making, project teams, leadership and organization skills.
Prerequisites: Foundation courses.

EMGT 5531 Technology Planning and Management
Credit: 3 | Lecture: 3
This course discusses frameworks and analytical processes for analyzing how firms can create, commercialize and capture value from technology-based products and services.
Prerequisites: Foundation courses.

EMGT 5630 Quantitative Decision Making for Engineering Management
Credit: 3 | Lecture: 3
This course provides a systematic approach to the formulation of problems, alternative research methodologies and decision making processes. The course is intended to provide students the skills and abilities necessary to integrate research purpose, technique and constraints. Topics include hypothesis formulation and testing survey development, reliability and validity analysis and application of statistical techniques.

EMGT 5631 Supply Chain Management
Credit: 3 | Lecture: 3 | Lab: 0
This course provides overall knowledge and concepts on Logistics and Supply Chain Management. The course focuses on facilities, inventory, transportation, information, sourcing and pricing, network design and analysis, and performance evaluation of Supply Chain Management using quantitative and quantitative approaches.
Prerequisites: EMGT foundation courses

EMGT 5632 Logistics Management
Credit: 3 | Lecture: 3
Logistics management course examines modes of freight transportation and institutional factors that influence transportation decisions; regulation, public policy, other governmental variables reviewed in detail. Course concept includes key logistics operations in multinational business using situational analysis, legal issue considerations, and analysis of supply chain, transportation, and functional implications. Additionally, distribution aspects of the logistics function within the firm such as warehousing, cross-docking, and distribution center management are explored.
Prerequisites: EMGT foundation courses

EMGT 5730 Fundamentals of Enterprise Resource Planning Software
Credit: 3 | Lecture: 3
This course provides the overall knowledge and concepts on enterprise resource planning (ERP) system. The focus of this course is on illustrating procurement, material requirement planning, production and sales business processes using ERP software. Use of SAP's ERP Business Suite as an example ERP system.
EMGT 5731 Business Analytics
Credit: 3 | Lecture: 3
The course fosters critical thinking about the data and the type of analytics applied on them, and teaches students how to identify business opportunities with business analytics. This course will focus on three main foundation areas of business analytics: reporting, visualization and prediction. This course will demonstrate business analytics in practice with latest technologies using SAP software.
Prerequisites: EMGT foundation courses.

EMGT 5739 Internship in Engineering Management
Credit: 3 | Lecture: 3
Supervised work experience in an approved Engineering Management field. Written and oral report required. Approval of faculty chair and associate dean required.
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

EMGT 5830 Modeling and Simulation
Credit: 3 | Lecture: 3
The course studies the concepts, theories and application of modeling and simulation. It covers both continuous and discrete-event simulation. The focus of the course is to learn the modeling techniques and use them to solve diverse business decision-making problems as a decision support system. Software will be utilized.
Prerequisites: EMGT foundation courses.

EMGT 5915 Cooperative Education Work Term
Credit: 1 | Lecture: 1
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description).
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

EMGT 5919 Independent Study in Engineering Management
Credit: 1 | Lecture: 1
Prerequisites: Foundation courses. Approval of faculty adviser, chair and associate dean.

EMGT 5931 Research Topics in Engineering Management
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

EMGT 5939 Independent Study in Engineering Management
Credit: 3 | Lecture: 3
Prerequisites: Foundation courses. Approval of faculty adviser, chair and associate dean.

EMGT 6837 Engineering Management Capstone Project
Credit: 3 | Lecture: 3
This is a project based course to summarize EMGT learning. The course consists of several projects from diverse EMGT areas and students need to complete group projects utilizing EMGT knowledge and skills.
Prerequisites: At least 21 hours of graduate work in EMGT.
EMGT 6838 Engineering Management Research Project
Credit: 3 | Lecture: 3
This is a project based course to summarize EMGT learning. The course consists of several projects from diverse EMGT areas and students need to complete group projects utilizing EMGT knowledge and skills. **Prerequisites: 21 hours of graduate work in EMGT.**

EMGT 6939 Master's Thesis Research
Credit: 3 | Lecture: 3
*Prerequisites: Approval of faculty adviser, thesis committee and dean.*

**ENSC Environmental Science**

ENSC 1301 Environmental Science I
Credit: 3 | Lecture: 3
An introduction to chemical and biological principles relating to ecology, natural resources including animals, plants, water, soil and air. Not for biology or environmental science majors.

ENSC 4336 Web GIS
Credit: 3 | Lecture: 3
This course aims to provide students with web GIS knowledge needed for managing web GIS projects, and to teach students the latest web GIS technologies needed for building modern web GIS apps. This course focuses on Esri's web GIS platform including the following products: ArcGIS Online, ArcGIS Pro, mobile apps, Story Maps, Web AppBuilder, and 3D web scenes.

ENSC 4337 Geospatial Technologies
Credit: 3 | Lecture: 3
This course focuses on the concepts and applications of Global Positioning Systems (GPS), Satellite imageries, Light Detection and Ranging (LiDAR), and Small Unmanned Aircraft Systems (sUAS). Students will gain the skills needed to acquire and use data from these geospatial technologies in applications such as topographic mapping, flood inundation, and vegetation analysis. The course components include lectures, fieldwork and labs.

ENSC 4351 Hydrogeology
Credit: 3 | Lecture: 3
Comprehensive study of hydraulic characteristics of soil, rocks, aquifers, rivers and lakes with application to environmental and water resource planning concerns. Topics covered include hydrological cycles, aquifer testing, contaminant transports in various geological media, water resources management and others. Laboratory exercises included. **Prerequisites: GEOL 4324**

ENSC 5031 Teaching Environmental Science
Credit: 3 | Lecture: 3
The course is designed for K-12 teachers to enhance their own knowledge, awareness and understanding of environmental issues (air, water and waste) of national and regional importance. It is also designed to equip teachers of all grades with the appropriate educational resources so that they may effectively teach their own students about issues of environmental sciences through classroom instruction, laboratory assignment, site visit, observations and field demonstration.
ENSC 5135 Statistical Analysis  
Credit: 3 | Lecture: 3  
Fundamental statistical concepts related to the applied industrial and environmental sciences: descriptive statistics; sampling; statistical distributions; confidence intervals, hypothesis testing; chi-square tests; correlation, simple and multiple linear regression; one-way ANOVA. Use of statistical software packages to analyze and present data.  
*Prerequisites: MATH 3308 or equivalent.*

ENSC 5233 Ecotoxicology  
Credit: 3 | Lecture: 3  
Study of environmental pollutants and their effects on natural populations and ecosystems.  
*Prerequisites: ENSC 4325 or ENSC 5332 or equivalent.*

ENSC 5331 Wetlands  
Credit: 3 | Lecture: 3  
Survey of wetlands types including coverage of environmental importance of wetlands, interaction of soils, geomorphology and biological community in wetlands formation, wetlands protection and wetlands creation. Field trips required.

ENSC 5332 Toxicology  
Credit: 3 | Lecture: 3  
Evaluation of the mechanisms of action, risks and effects of exposure to toxic substances  
*Prerequisites: CHEM 2323 and ENSC 4325 or BIOL 4341 or BIOL 4344 or BIOL 4345 or equivalent.*

ENSC 5333 Fundamentals of Environmental Engineering  
Credit: 3 | Lecture: 3  
The course is designed to provide a broad overview of current environmental problems as well as in-depth discussions on engineering solutions. Includes the fundamentals of mass/energy balance, chemistry, microbiology and physics application to environmental problems. Basic engineering design used in water quality management, water treatment, wastewater treatment, air quality, pollution control and solid/hazardous materials management will be the themes of this course.  
*Prerequisites: CHEM 3333 or equivalent.*

ENSC 5431 Contaminant Fate and Transport  
Credit: 3 | Lecture: 3  
Principles of contaminant behavior in the environment. Case studies on important toxic chemicals including heavy metals, petroleum hydrocarbons, soap and detergents, pesticides, and polycyclic aromatic hydrocarbons. Suitable for non-majors.  
*Prerequisites: CHEM 3333 or equivalent.*

ENSC 5530 Research Methods: Environmental Science  
Credit: 3 | Lecture: 3  
Development of proposal for master's project or thesis research.  
*Prerequisites: STAT 5135, adviser approval and approved research topic.*

ENSC 5531 Aquatic Toxicity Testing  
Credit: 3 | Lecture: 3  
Theory of toxicity testing, laboratory practice in EPA standard aquatic toxicity tests and statistical analyses.  
*Prerequisites: ENSC 4235 or ENSC 5332 or equivalent.*
ENSC 5532 Hydrology of Surface Water
Credit: 3 | Lecture: 3
Course will emphasize principles of occurrence and movement of surface water. Factors applying to pollution, estimates of supply and engineering aspects will be studied. Local case studies of water resources, flooding and effects included. Laboratory exercises included. 
Prerequisites: GEOL 3304 or equivalent.

ENSC 5533 Environmental Biotechnology
Credit: 3 | Lecture: 3
This course introduces the concepts of microbiology and plant biology, the principles and applications of environmental biotechnology. Topics include stoichiometry, kinetics, mass balance, wastewater treatment, landfill, composting, plant-based phytoremediation, biodegradation and bioremediation of contaminated soils and groundwater.

ENSC 5535 Sampling & Analysis of Environmental Contaminants
Credit: 3 | Lecture: 3
Field sampling techniques, US EPA/OSHA/USGS/ASTM standard methodology, field and lab quality assurance/quality control (QA/QC), wet chemical methods and instrumentations for the analysis of environmental contaminants. 
Prerequisites: STAT 3308

ENSC 5536 Environmental Remediation
Credit: 3 | Lecture: 3
Soil and groundwater pollutant sources, types, migration; chemical and hydrogeological site characterization; chemical/biological/thermal technologies (pump-and-treat, vapor extraction, bioremediation and incineration) for the remediation of contaminated sites such as Superfund sites, landfills, brownfields, leaking storage tanks and oil spills.
Prerequisites: CHEM 3333 or equivalent.

ENSC 5537 Hydrology of Groundwater
Credit: 3 | Lecture: 3
Course emphasizes principles of occurrence and movement of ground water. Factors applying to pollution, estimates of supply and engineering aspects will be emphasized. Local case studies will be included. Laboratory exercises included. 
Prerequisites: GEOL 3304, GEOL 4351.

ENSC 5631 Remote Sensing: Applications in Geology
Credit: 3 | Lecture: 3
Course emphasizes principal sensors and products of spacecraft remote sensing. Emphasizes applications of remote sensing to geology, hydrology, oceanography and biology. Land use and other environmental applications are also included. Laboratory exercises included. 
Prerequisites: GEOL 3304, GEOL 4222, GEOL 4324 or equivalent.
ENSC 5632 Hazardous Materials in Geological Environment
Credit: 3 | Lecture: 3
Study of the environmental problems arising from use of the geologic environment as a waste repository. Course includes such topics as landfills, clay lined waste pits, underground storage tanks, deep well injection, role of salt deposits in waste disposal and ordinance contamination of Department of Defense sites.
Prerequisites: ENSC 5537.

ENSC 5633 Environmental Chemodynamics
Credit: 3 | Lecture: 3
Focus on the kinetic and thermodynamic mechanisms for chemical movement across air/soil, soil/water, water/sediment and water/air interfaces and how natural processes affect movement of chemicals in air, water, sediment and soil; information vital to performing human and ecological risk assessments.
Prerequisites: ENSC 3332.

ENSC 5731 Environmental Organic Chemistry
Credit: 3 | Lecture: 3
Examine fundamental molecular processes of environmental organic contaminants in natural and engineered systems. Topics include equilibrium partitioning (air–water–soil–biota), sorption to soils and sediments and transformation processes (oxidation, reduction, hydrolysis, photolysis, biodegradation).
Prerequisites: CHEM 2323, ENSC 3333.

ENSC 5915 Cooperative Education Work Term
Credit: 1 | Lecture: 1
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

ENSC 5919 Independent Study in Environmental Science
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

ENSC 5929 Independent Study in Environmental Science
Credit: 2 | Lecture: 2
Prerequisites: Approval of instructor, chair and associate dean.

ENSC 5931 Research Topics in Environmental Science
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

ENSC 5939 Independent Study in Environmental Science
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean.
ENSC 6731 Graduate Seminar  
Credit: 3 | Lecture: 3  
Advanced seminar where an in-depth perusal of an environmental science topic shall be undertaken and a formal paper and presentation shall be completed.  
Prerequisites: ENSC 5530, STAT 5135 and 24 hours completed in an approved graduate program.

ENSC 6838 Research Project  
Credit: 3 | Lecture: 3  
Students complete their research project; write the research paper and present research findings in a public forum.  
Prerequisites: ENSC 5530, 24 hours completed within a CPS and approval of graduate adviser.

ENSC 6939 Master's Thesis Research  
Credit: 3 | Lecture: 3  
Prerequisites: Master's degree candidacy as well as approval by adviser, master's committee and dean.

ENVR Environmental Management

ENVR 5131 Foundations in Sustainability  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers the fundamentals of sustainability, including sustainability definitions and models, triple bottom line considerations in business, and sustainability concerns in natural resource management and community planning. Students taking this course will obtain a overview of how and where management and environmental management professionals interact with the field of sustainability. (Cross-listed with MGMT 6131)

ENVR 5132 Global Sustainability and Strategic Advantage  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides a basic understanding of the strategic implications and applications related to business and institutional sustainability. Using a strategy lens, this course seeks to provide students with an understanding of the key concepts related to the business case of sustainability, tackling topics key to sustainable strategies and social responsibility through a mix of assignments and case analyses.  
Prerequisite: ENVR 5131  
Prerequisites: ENVR 5131

ENVR 5134 Oil & Hazardous Materials Spills  
Credit: 3 | Lecture: 3 | Lab: 0  
Regulations, contingency planning and spill prevention in the handling of petroleum and hazardous materials.

ENVR 5331 Environmental Economics  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers the interaction of environmental problems and the American economy with a focus on the energy sector. Particular focus examines the compatibility of economic progress with programs of environmental control. (Cross-listed ECON 5137)

ENVR 5332 Environmental Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Federal and state environmental legislation and case law; concepts of regulation and their application to management decisions.

ENVR 5333 Air Quality Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Standards for air quality; governmental policies and industrial practices in preventing and controlling atmospheric pollution.
ENVR 5336 Solid Waste Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis of waste from commercial, institutional and residential sources; emphasis on resource recovery, control and disposal methods.

ENVR 5437 Managing Environmental and Ethical Issues  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses a variety of issues related to ethical and environmental matters, and approaches for managing them. It will include an introduction to environmental ethics, and also examine several cases where ethical and/or environmental issues were managed both poorly and well.

ENVR 5532 Water Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Development and utilization of water resources; effects of ecological change and public policies on the management of water quantity and quality.

ENVR 5533 Pollution Control Technology  
Credit: 3 | Lecture: 3 | Lab: 0  
Applied processes in pollution control; emphasis on process selection factors including efficiency, cost, manpower, energy usage and practical utility.  
*Prerequisites: Introductory chemistry.*

ENVR 5534 Permits and Procedures  
Credit: 3 | Lecture: 3 | Lab: 0  
Requirements for air, water, solid and hazardous waste and other environmental permits; federal, state and local administrative procedures for obtaining and keeping permits.

ENVR 5537 Managing Contaminated Sites  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers topics related to cleaning up environmental contamination, including: pollution prevention; emergency response and reporting; spill containment and cleanup; site assessment; remedial design; working with the public; contractor management; project management and budget; cleanup technologies; and closure and monitoring requirements.

ENVR 5931 Research Topics in Environmental Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

ENVR 5939 Independent Studies in Environmental Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Independent directed study in Environmental Management.  
*Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.*

ENVR 6132 Environmental Impact Assessment  
Credit: 3 | Lecture: 3 | Lab: 0  
Practice in and analysis of environmental impact assessment, environmental auditing and other planning and decision tools.  
*Prerequisites: ENVR 5332 and one of ENVR 5333, 5337, 5532, or permission of the instructor.*

ENVR 6133 Environmental Risk Management  
Credit: 3 | Lecture: 3 | Lab: 0  
A broad approach to risk management, incorporating risk assessment and communication and concentrating on case studies.
ENVR 6332 Ecological Issues for the Future
Lecture: 0 | Lab: 1
The relationship between man and environment in the future; limits to the exploitation of natural resources.

ENVR 6333 Coastal Resilience
Credit: 3 | Lecture: 3 | Lab: 0
This course introduced the concepts of coastal resilience, including concepts of and management for: coastal geomorphology and sea level rise, coastal erosion, coastal storms, population growth, corporate sustainability, land management, community response and recovery, resilient growth patterns, and long-term community planning. This course features a number of guest speakers from local organizations, communities, and businesses (NASA, Galveston Parks Board, City of Shoreacres, Texas Center for Beaches and Shores/Institute for Selilent Coastal Communities at TAMUG, Texas Coastal Watership Programs, Landry's and others) who bring their perspectives on how coastal change influences their particular organizations, and how they are responding to those changes. Prerequisites: Master's degree candidacy and approval of adviser and dean.

ENVR 6334 Sustainability and Strategic Advantage
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a basic understanding of the strategic implications and applications related to business and institutional sustainability. Particular focus is provided involving the use of a strategic lens as related to social responsibility, environmental management, and community and economic development. Prerequisites: ENVR 5131 Foundations in Sustainability

ENVR 6732 Environmental Management Practices
Credit: 3 | Lecture: 3 | Lab: 0
The use of case studies, problems and field work to analyze current practices and situations in environmental management. Prerequisites: Approval of instructor and adviser.

ENVR 6739 Internship in Environmental Management
Credit: 3 | Lecture: 3 | Lab: 0
Supervised internship with a public or private environmental agency; written and oral reports required. Prerequisites: Master's degree candidacy and approval of adviser and dean.

ENVR 6939 Master's Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Master's degree candidacy and approval of adviser and dean.
EXHS Exercise and Health Sciences

EXHS 5130 Epidemiology
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of the cause, transmission, and measurement of disease within a population. Particular focus on the strength and limitations of various research methods and tools used for population public health. Students learn to critically assess and problem solve relevant public health problems using epidemiological methods.

EXHS 5131 Applied Exercise Physiology: Neuromuscular
Credit: 3 | Lecture: 3 | Lab: 0
Neuromuscular function: lecture, discussion, and lab experience dealing with the impact of acute and chronic exercise on the neuromuscular and endocrine systems. Emphasis upon physiologic responses to various strength training procedures protocols.

EXHS 5132 Applied Exercise Physiology: Cardiopulmonary
Credit: 3 | Lecture: 3 | Lab: 0
Cardiopulmonary function: attention is focused on cardiopulmonary adaptations to acute exercise as well as adaptations associated with regular exercise training. Emphasis on the physiologic responses to metabolic training procedures.

EXHS 5133 Sports Nutrition
Credit: 3 | Lecture: 3 | Lab: 0
Study of the effect of nutrition on sports performance and health.
Prerequisites: HLTH 4303 or other undergraduate nutrition course.

EXHS 5134 Clinical Nutrition
Credit: 3 | Lecture: 3 | Lab: 0
Exploring the principles and practices of evidence-based clinical nutrition and nutrition interventions in people with chronic diseases.

EXHS 5135 Social and Behavioral Aspects of Public Health
Credit: 3 | Lecture: 3 | Lab: 0
The course will cover the major social and behavioral science theories and models used in health promotion and disease prevention, covering many aspects of the behavioral sciences, including individual, community, organizational, and social impacts on health. It also covers social inequalities and related disparities in health status related to race, social class, and gender; the critical intersection between social and behavioral risk factors; and the development and implementation of public health interventions.

EXHS 5136 Health Policy Management
Credit: 3 | Lecture: 3 | Lab: 0
This course surveys theory and practice in the management and policy sciences applied to the field of public health. Topics include: the history of health care delivery and public health, healthcare payment and reimbursement mechanisms, types of health care organizations, the Triple Aim, international health care systems, and policy-making decision processes.
EXHS 5137 Environmental & Occupational Health
Credit: 3 | Lecture: 3 | Lab: 0
Course covers environmental health risks that impact our daily lives, including restaurant inspection and food safety, water and air pollution, bio-terrorism, environmentally induced skin cancers, mold and indoor air quality, workplace hazards and environmental control of infectious disease.

EXHS 5138 Exercise in Chronic Disease: Musculoskeletal and Neurologic
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of exercise as a preventative, curative, and rehabilitative modality in individuals with or at risk for chronic musculoskeletal and neurologic diseases and long-term injuries.

EXHS 5231 Technology in Human Performance
Credit: 3 | Lecture: 3 | Lab: 0
Exploring the state-of-the art concepts, methodologies and equipment utilized in human performance data collection and analysis.

EXHS 5333 Organizational Wellness
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the purposes, methods, and objectives of wellness programs in the public and private sector.

EXHS 5335 Exercise in Chronic Disease: Cardiopulmonary and Metabolic
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of exercise as a preventive, curative, and rehabilitative modality in individuals with or at risk for chronic cardiopulmonary and metabolic diseases.

EXHS 5931 Research Topics in Health
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

EXHS 5939 Independent Study in Health
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

EXHS 6032 Advanced Seminar in Sports Medicine
Credit: 3 | Lecture: 3 | Lab: 0
Discussion of current research issues in cardiopulmonary, metabolic, environmental, orthopedic, and biomechanical factors related to athletic injuries.

EXHS 6033 Laboratory Techniques and Research Design
Credit: 3 | Lecture: 0 | Lab: 3
Concepts and methodology related to performing exercise science research. Examination of the various statistical methods and testing procedures used in exercise science research and practice.

EXHS 6034 Screening and Testing in Chronic Disease
Credit: 3 | Lecture: 2 | Lab: 1
Screening procedures, exercise tests, and other evaluation techniques for people with chronic diseases.
EXHS 6035 Biostatistics
Credit: 3 | Lecture: 3 | Lab: 0
Overview of the tools for collection, analysis, and presentation of data in all areas of public health and biomedical sciences. Topics covered include general principles of study design, hypothesis testing, review of methods for comparison of discrete and continuous data including ANOVA, t-test, factorial ANOVA, repeated measures ANOVA, correlation, and regression.

EXHS 6036 Biomechanics of Sports and Exercise
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of the kinematics and kinetics of human movement and the way the laws of physics impact sport and exercise. Particular emphasis is placed on laboratory and field measurement techniques used to quantify and evaluate human performance.

EXHS 6037 Advanced Seminar in Peak Performance
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the techniques and methodologies to improve performance by enhancing strength, flexibility, speed, power, agility, and coordination. Topics vary; may be repeated for credit with permission of instructor.

EXHS 6039 Research in Human Performance
Credit: 3 | Lecture: 3 | Lab: 0
Practical experience in research methodologies related to exercise and sports science. Students will participate in ongoing research projects in the Exercise and Nutritional Health Institute including data collection, statistical analysis, and presentation. Topics vary; may be repeated for credit.

EXHS 6131 Exercise Pharmacology
Credit: 3 | Lecture: 3 | Lab: 0
This course will discuss how commonly used medications and supplements can effect exercise performance with chronic disease.

EXHS 6330 Advanced Seminar in Public Health
Credit: 3 | Lecture: 3 | Lab: 0
Course is designed to provide a framework for students to integrate a variety of public health topics, issues, and skills into a culminating experience. Students must have completed or be concurrently enrolled in Public Health core courses.

EXHS 6639 Clinical Exercise Practicum
Credit: 3 | Lecture: 3 | Lab: 0
This course provides practical experience in research implementation, testing and exercise prescription for people with chronic diseases, disabilities, and long-term injuries.

EXHS 6739 Graduate Internship
Credit: 3 | Lecture: 0 | Lab: 0
Minimum of two days a week in an approved setting. Written report required. Arrangements for internship should be completed by preregistration.
**Prerequisites:** 24 hours of graduate-level coursework and approval of internship coordinator.

EXHS 6839 Master's Project Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, project director, and department chair required.

EXHS 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, thesis director, and department chair required.
FINC Finance

FINC 5131 The Financial System
Credit: 3 | Lecture: 3 | Lab: 0
The role of money and banking system in the economy; the implications for policy by the central monetary authority; and the role of financial markets and institutions.

FINC 5133 Corporate Finance
Credit: 3 | Lecture: 3 | Lab: 0
Develop understanding of the decisions made by financial managers. These decisions are valuation of assets, measuring risk and return, choosing among investment alternatives, financing of operations, capital structure decisions, dividend policy, merger and acquisition decisions, and others.

FINC 5134 Real Estate Investment Analysis and Financing
Credit: 3 | Lecture: 3 | Lab: 0
Analytical techniques of evaluating real estate investments and exploration of the methods of financing such investments.

FINC 5231 Quantitative Methods in Finance
Credit: 3 | Lecture: 3 | Lab: 0
Quantitative methods necessary for the investment generalist which include discounted cash flow analysis, statistics and probability, sampling and hypothesis testing, correlation, and regression analysis.

FINC 5331 Treasury Management Practices
Credit: 3 | Lecture: 3 | Lab: 0
An examination of the general principles and practices used to manage firm liquidity, capital and risk management functions.

FINC 5332 Financial Statement Analysis
Credit: 3 | Lecture: 3 | Lab: 0
Analyzing, interpreting and forecasting financial statements for credit, investment and internal planning decisions.

FINC 5333 Personal Wealth Management
Credit: 3 | Lecture: 3 | Lab: 0
A broad approach to major personal finance topics, including investments, insurance, income taxation and auto purchases, retirement and estate planning. Topics will be examined separately and as they relate to one another in financial planning.

FINC 5532 Budget and Control–Government/Service Organizations
Credit: 3 | Lecture: 3 | Lab: 0
Principles and practices of effective budgeting and management control in Government and Service Organizations are presented. Among the topics covered in this course are the budget cycle, alternative budgeting frameworks, designing management control structures, cost-benefit analysis, reporting and measurement, and designing management control systems.

FINC 5733 Retirement and Benefits Planning
Credit: 3 | Lecture: 3 | Lab: 0
An examination of the various retirement vehicles, group life and health programs, and government required benefits. Integration into an overall financial planning process is emphasized.
Prerequisites: Managerial Finance or equivalent.

FINC 5931 Research Topics in Finance
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered.
FINC 5939 Independent Studies in Finance
Credit: 3 | Lecture: 3 | Lab: 0
Independent directed study in Finance.
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

FINC 6131 Commercial Banking
Credit: 3 | Lecture: 3 | Lab: 0
Structure, management and regulation of the US banking industry from its origins to the present day, including performance measurement, risk management and lending analysis.

FINC 6231 Investment Management
Credit: 3 | Lecture: 3 | Lab: 0
Evaluation of capital market theory and rigorous treatment of securities evaluation to determine the probability distribution of expected returns.
Prerequisites: FINC 5133 or equivalent.

FINC 6233 Options and Futures
Credit: 3 | Lecture: 3 | Lab: 0
Study of the principles governing the use and valuation of options, swaps and financial futures. Emphasis will be placed on using these derivative securities for hedging.
Prerequisites: FINC 5133 or equivalent.

FINC 6234 Portfolio Management
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: FINC 6231 or equivalent.

FINC 6531 International Finance
Credit: 3 | Lecture: 3 | Lab: 0
International financial operations, including foreign trade financing, risk and credit evaluation, letters of credit and bankers' acceptances; role of political and social pressures.
Prerequisites: FINC 5133 or equivalent.

FINC 6533 Seminar in International Finance
Credit: 3 | Lecture: 3 | Lab: 0
Meetings in the field are conducted with the chief financial officers of both financial and non-financial corporations operating in other countries. Discussions will concern long and short-term financial planning, including the impact of exchange rate fluctuations on planning operations.

FINC 6731 Seminar in Finance (Capstone)
Credit: 3 | Lecture: 3 | Lab: 0
Investment and financing decisions of individuals and businesses in the presence of taxes and uncertainty—a microeconomic approach.
Prerequisites: FINC 5133 or equivalent and the last long semester.

FINC 6739 Internship in Finance
Credit: 3 | Lecture: 3 | Lab: 0
Six hours of supervised work experience each week in an approved financial institution or firm.
Prerequisites: Master's degree candidacy, approval of associate dean, faculty chair, and sponsoring faculty member.

FINC 6939 Master's Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Master's degree candidacy and approval of Department Chair and Dean.
GEOG Geography

GEOG 1301 Modern Physical Geography
Credit: 3 | Lecture: 3 | Lab: 0
An identification of the geographical dimensions of ecosystems and the earth's physical characteristics as they relate to process, distribution patterns, and implications for humans.

GEOG 1303 World Regional Geography
Credit: 3 | Lecture: 3 | Lab: 0
Study of major world regions with emphasis on prevailing conditions and developments, including emerging conditions and trends and the awareness of diversity of ideas and practices found in those regions. Course content may include one or more regions.

GEOG 4314 Teaching Geography
Credit: 3 | Lecture: 3 | Lab: 0
An exploration of best practices for teaching geography in K-12 schools. Topics include: the nature of geographic reasoning; integrating geography in the social studies curriculum; teaching strategies; and assessment.

GEOG 5134 Introduction to Geographic Information Systems
Credit: 3 | Lecture: 3 | Lab: 1
Introduction to Geographic Information Systems theory, capabilities, technology, and applications. Topics include GIS data discovery, data structure and management; principles of cartographic visualization; and basic spatial analysis and modeling.

GEOG 5135 Advanced Geographic Information Systems
Credit: 3 | Lecture: 3 | Lab: 1
Design and use of geographic information systems to support analytical modeling and geospatial processing for professional development, research, and practice. Topics include the automation of geoprocessing and database manipulation, geospatial research, creation of spatial data using remote sensing classification methods, spatial statistics and data mining, and geospatial modeling.

Prerequisites: GEOG 5134

GEOG 5931 Research Topics in Geography
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

GEOL Geology

GEOL 1303 Physical Geology
Credit: 3 | Lecture: 3
An introduction to physical geology. A study of minerals, rocks, earth's structures and the geological processes that modify the earth's surface.

GEOL 3307 Geographical Information Systems
Credit: 3 | Lecture: 3 | Lab: 0
This course covers the fundamentals of GIS including GIS terminology and architecture, GIS data structures, cartographic principles, data sources and methods of data acquisition, including remote sensing, data manipulation and conversion, query techniques and spatial analysis.
GEOL 4323 Soils in the Environment  
**Credit: 3 | Lecture: 3**  
Study of the environmental aspects of soils including expansive soils, clay minerals, soil contamination and subsurface pathways for pollutants. Laboratory and fieldwork included.  
**Prerequisites: Chemistry.**

GEOL 4356 Soil and Groundwater Remediation  
**Credit: 3 | Lecture: 3**  
Chemical, biological, geological principles and applications of various remediation techniques used to clean up contaminated soils and groundwater. Cross-Listed as: CHEM 4356  
**Prerequisites: CHEM 3333.**

GEOL 5233 Environmental Geochemistry  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Basic solution geochemistry and equilibria concepts to formation and alteration of sedimentary materials of low temperature origin. Geochemistry of fluids in natural aqueous environments with emphasis on diagenesis and weathering.  
**Prerequisites: ENSC 3332 or equivalent.**

GEOL 5331 Advanced Environmental Geology  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Relationships and interactions between pollutants and earth materials, land instability hazards, resource exploitation problems; and other topics of current interest.

GEOL 5531 Hydrology of Groundwater  
**Lecture: 3**  
Course emphasizes principles of occurrence and movement of ground water. Factors applying to pollution, estimates of supply and engineering aspects will be emphasized. Local case studies will be included. Laboratory exercises included.  
**Prerequisites: GEOL 3304, GEOL 4351**

GEOL 5532 Hydrology of Surface Water  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Course will emphasize principles of occurrence and movement of surface water. Factors applying to pollution, estimates of supply and engineering aspects will be studied. Local case studies of water resources, flooding and effects included. Laboratory exercises included.  
**Prerequisites: GEOL 3304 or equivalent.**

GEOL 5631 Remote Sensing: Applications in Geology  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Course emphasizes principal sensors and products of spacecraft remote sensing. Emphasizes applications of remote sensing to geology, hydrology, oceanography and biology. Land use and other environmental applications are also included. Laboratory exercises included.  
**Prerequisites: GEOL 3304, GEOL 4222, GEOL 4324 or equivalent.**

GEOL 5632 Hazardous Materials in The Geologic Environment  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Study of the environmental problems arising from use of the geologic environment as a waste repository. Course includes such topics as landfills, clay lined waste pits, underground storage tanks, deep well injection, role of salt deposits in waste disposal and ordinance contamination of Department of Defense sites.  
**Prerequisites: GEOL 5531.**
GEOL 5730 Planetary Geology  
Credit: 3 | Lecture: 3 | Lab: 0  
Comparison of the planets and the solid surface satellites with emphasis on the terrestrial planets. Latest space probe data included.  
*Prerequisites: GEOL 3304 or equivalent, GEOL 3317, GEOL 4324.*

GEOL 5931 Research Topics in Geology  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

GEOL 5939 Independent Study in Geological Sciences  
Credit: 3 | Lecture: 3 | Lab: 0  
*Prerequisites: Approval of instructor, chair and associate dean.*

GEOL 6838 Research Project and Seminar  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will develop a research proposal which allows integrating knowledge and standard procedures in the discipline. A written paper and a presentation will be required.  
*Prerequisites: 24 hours completed in approved graduate program.*

GEOL 6939 Master’s Thesis Research  
Credit: 3 | Lecture: 3 | Lab: 0  
*Prerequisites: Approval of adviser, master's committee and dean.*

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HADM Healthcare Administration

HADM 5032 Foundations & Management of Healthcare Delivery  
Credit: 3 | Lecture: 3 | Lab: 0  
To provide the student with an understanding of the leadership, organization and financing of health services in the United States, to help the student begin to become a healthcare leader, and to identify and discuss current trends in health care delivery, management and operation of hospitals, physician practices, and managed care companies.

HADM 5033 Leadership of Organizations in Healthcare Administration  
Credit: 3 | Lecture: 3 | Lab: 0  
Development of leadership potential by strengthening abilities in visioning, interpersonal team skills, negotiation, decision analysis and conflict management. Use of self-assessments and group projects with outside clients. Application of organization theory and concepts to health services organizations. Topics include systems thinking, organization structure and design, organizational effectiveness and change management.

HADM 5131 Healthcare Human Resources Management  
Credit: 3 | Lecture: 3 | Lab: 0  
To acquaint the student with concepts and methods needed to plan and forecast, recruit, train, develop and evaluate health manpower. Also to provide an understanding of the impact of licensing, regulation and labor relations activities on health care institutions.
HADM 5132 Managerial Epidemiology  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Introduction to the concepts of public and personal health and disease. Problems in the measurement, analysis, organization and administration of intervention programs will be highlighted. An analysis of individual, community and institutional health efforts will be conducted.

HADM 5232 Financial Management of Healthcare Organizations I  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is designed for students with no accounting training. Topic areas covered are accounting concepts and principles, financial statements, financial statement analysis, forms of business organizations, budgeting, cost analysis, activity based accounting, and accounting for financial decisions. This course cannot be taken by accounting majors or MBA students.

HADM 5233 Financial Management of Healthcare Organizations II  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Emphasis is placed on financial concepts and practices specific to the healthcare industry, ratio analysis payment methodologies, bundled pricing, Healthcare budgeting, Cost Volume Profit, Variance Analysis, capital financing in the healthcare industry.  
*Prerequisites: HADM 5232 or equivalent.*

HADM 5234 Healthcare Ethics, Values, and Social Responsibilities  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Emphasis is placed on resolving ethical issues in healthcare as well as business ethics, biomedical and research ethical issues, services to be offered, distribution of resources and developing a personal value system, and relating that system to the needs of the community.  
*Prerequisites: HADM 5432, or equivalents.*

HADM 5331 Planning Healthcare Services  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Analysis of the requisites, demands, processes and methods of planning health services. Community planning, program evaluation, setting objectives for health service and business planning are examined.

HADM 5333 Healthcare Economics  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Students will apply the basic tools of microeconomics to issues in healthcare policy and management. Economic concepts relevant to healthcare managers will be examined such as analyses of the demand and supply of healthcare goods and services, the role of health insurance and healthcare financing, marketing failure and the need for government intervention in healthcare markets, and new initiatives to improve population health.
HADM 5334 Marketing Healthcare Services  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course will provide students with the knowledge and skills needed to effectively market health care products and services. The course will focus on analyzing the health care marketing and management environment, identifying the primary marketing problems facing health care organizations and developing compelling and creative strategies for solving these problems. Fundamental concepts of marketing such as segmentation, targeting, positioning, customer satisfaction and perceived value will be reviewed in the context of health care marketing. Specific health care marketing tools will be presented to help in identifying problems and developing strategies.

HADM 5335 Planning & Marketing Healthcare Services  
**Credit: 3 | Lecture: 3 | Lab: 1**  
This course will provide students with knowledge and skills needed to effectively plan and market healthcare products and services. The course will focus on identifying and analyzing marketing and planning problems faced by health care related organizations. Topics to be covered: SWOT analysis, Marketing Mix, Market Segmentation, Marketing Research, etc. This comprehensive course is designed to help students in developing compelling and create strategies for solving these problems. Fundamental concepts of marketing and specific health care marketing tools for community health needs assessment and planning as well as analysis of the requisites, demands, processes and methods needed in future health services are studied.

HADM 5431 Healthcare Information Technology  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Provides the student with knowledge and skills needed to successfully perform in a leadership role in the current information systems dependent environment. Prepares the student for management oversight; administrative design; acquisition, installation, and implementation; and operation of healthcare management information systems.

HADM 5432 Healthcare Predictive Analytics  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Provides the knowledge and skills necessary to perform successfully in a healthcare leadership role in an increasingly information-dependent environment. Using statistical software, students will learn to manipulate and analyze data to make informed financial, operational, and public health decisions. By the end of the course, students will be able to take large datasets and predict various health outcomes using demographic and clinical indicators with the end-intent of recommending actions to be taken for clinical, operational, and financial gain.

HADM 5433 Introduction to Public Health  
**Credit: 3 | Lecture: 3 | Lab: 1**  
Provides the student a comprehensive introduction to the essential concepts, values, principles, and practice of public health and the relationship of public health to the complex US health care delivery system. Familiarizes the student with public health practice in a number of settings including government, private sector, and community organizations. Addresses important health issues and problems facing the US public health system.
HADM 5531 Group Practice Management  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Introduces the student to the concepts of physician practice management including procedure coding, diagnosis coding, insurance billing and documentation, personnel management, marketing, patient relations, financial management, venture planning, risk management, physician agreements, legal/tax/professional liability patient centered medical home, and physician pay for performance.

HADM 5731 Healthcare Quality  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Provides the student with knowledge and skills in organization development and change in healthcare facilities as well as total quality management and quality improvement in healthcare organizations. Prepares student for productivity improvement efforts, organization redesign and reengineering in healthcare. Also prepares student for developing and strengthening or redesigning quality improvement programs. Provides coverage of case management and care pathways.

HADM 5911 Special Topics in Healthcare Management  
**Credit: 1 | Lecture: 1 | Lab: 0**  
One hour credit special topics in healthcare management to be identified each time the course is offered.

HADM 5939 Independent Studies in Healthcare Administration  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Independent directed study in Healthcare Administration.  
*Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.*

HADM 6132 Legal Aspects of Healthcare Systems  
**Credit: 3 | Lecture: 3 | Lab: 0**  
To acquaint the student with the legal issues in health services administration by study of the legal system, licensing, liability and professional ethics.

HADM 6235 Integrated Delivery Systems  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Acquaints the student with managed care terminology, contracting for providers and payors, ACOs, Shared Risk contracting, Value Based Purchasing, Clinical Intergration, government programs, legal issues and provider reimbursement. *Prerequisite: HADM 5032 or equivalent.*

HADM 6236 Healthcare Facilities Operations  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Management, clinical professional and supporting staff must recognize their core competency is providing a specific portfolio of healthcare services to a set of managers of patient populations. The learning objectives for the course include strategies for: re-positioning medical services for managed care; expanding market programs to meet target customers' needs and reporting outcomes to prove the organization's value to its customers; operations strategies for managed care; and performance measures information management. Prerequisites: One other HADM course, or permission of the HADM Director.  
*Prerequisites: One other HADM course, or permission of the HADM Director.*
HADM 6539 Graduate Residency in Healthcare Administration
Credit: 3 | Lecture: 3 | Lab: 0
Permission of instructor dependent upon language requirement, Oral TOFEL (if student does not hold a Bachelors degree from a U.S. institution), minimum GPA of 3.3, current MHA or MHA/MBA student, one semester of Internship or healthcare work experience, and other criteria (see HADM program list). Supervised residency with an approved health agency or organization: written and oral reports required.
Prerequisites: Master's degree candidacy, HADM 6519, approval of dean and approval of instructor.

HADM 6738 Seminar in Healthcare Policy and Leadership
Credit: 3 | Lecture: 3 | Lab: 0
Designed to provide the student with an opportunity to apply and integrate previous courses, readings and research in a problem-solving environment. By the use of case studies, problems, field work, case presentations and simulation students will analyze situations and present their findings orally and in written form.
Prerequisites: Must be taken in the student’s last long semester or with permission of the Chair.

HADM 6739 Internship in Healthcare Administration
Credit: 3 | Lecture: 3 | Lab: 0
Must have completed at least one semester in the program. Supervised internship with position or project in a healthcare facility. Written and oral reports required. No more than 3 hours of internship credit can be applied toward degree.
Prerequisites: Master's degree candidacy and approval of adviser and dean.

HADM 6939 Master's Thesis Research
Lecture: 0 | Lab: 1
Prerequisites: Master's degree candidacy and approval of adviser and dean.

HADM 6969 Master's Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Master's degree candidacy and approval of adviser and dean.

HIST History

HIST 2301 Texas History
Credit: 3 | Lecture: 3 | Lab: 0
A survey of the political, social, economic, cultural, and intellectual history of Texas from the pre-Columbian era to the present. Themes that may be addressed in Texas History include: Spanish colonization and Spanish Texas; Mexican Texas; the Republic of Texas; statehood and secession; oil, industrialization, and urbanization; civil rights; and modern Texas.

HIST 3325 Colonial America
Credit: 3 | Lecture: 3 | Lab: 0
Introduction to European exploration, conquest, and colonization in North America from c. 1500 to 1763.

HIST 3327 The New American Nation
Credit: 3 | Lecture: 3 | Lab: 0
Emergence and development of a distinctly American society, politics, and national identity.

HIST 3330 Civil War and Reconstruction
Credit: 3 | Lecture: 3 | Lab: 0
The experience of Americans from the 1840s to the 1870s; their attempts to reconcile sectional and national identities.
HIST 5031 Research and Methods Seminar  
Credit: 3 | Lecture: 3 | Lab: 0  
Research methods and techniques essential to the craft of history, including historiography, bibliography, modes of analysis, and the use of primary and secondary sources. Offered only in the fall semester. This course is required for completion of the M.A. in History.

HIST 5130 U.S. and the Soviet Union  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of conflict with the Soviet Union with emphasis on the domestic impact in the United States.

HIST 5131 Studies in Early American History, 1607–1815  
Credit: 3 | Lecture: 3 | Lab: 0  
Critical examination of major issues and themes in the history of the British North American colonies that became the United States. Topics vary; may be repeated for credit with the permission of instructor.

HIST 5132 The Civil War and Reconstruction  
Credit: 3 | Lecture: 3 | Lab: 0  
American society and politics between the 1850s and the 1870s, emphasizing the end of slavery and the emergence of industrial America.

HIST 5133 Antebellum America, 1815–1860  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of specific problems and themes in 19th-century American culture such as changes in family structure, race relations, the status of women, and psychology of popular culture. Topics vary; may be repeated for credit with permission of instructor.

HIST 5230 Reel Europe  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the cultural movements and political developments through European cinema. Our filmic analysis will draw on historical documents, fiction, and political manifesto as a way of understanding broad movements such as the rise of modern technology, artistic modernism, and the political movements of communism, fascism, and terrorism. Students will develop critical and analytical skills through the use of both primary and secondary sources in order to achieve an understanding of the twentieth century cultural history.

HIST 5232 U.S. Social Movements  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis and comparison of ideology, composition, and social role of such reform movements as abolitionism, civil rights, feminism, labor unions, populism, progressivism, and socialism. Topics vary; may be repeated for credit with permission of instructor.

HIST 5235 Studies in Modern U.S. History  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of a period or theme in U.S. History from the 1870s to the present. Topics vary; may be repeated for credit with permission of instructor.

HIST 5236 Studies in History and Film  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of such topics as the history of film genres or filmmakers; the use of film as historical evidence; the correlation of films to history. Topics vary; may be repeated for credit with permission of instructor.
HIST 5237 Nazi Cinema and the Third Reich
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of the Third Reich through film and cultural artifact. Film was a medium which preserved old notions of identity, while offering new instruments of consensus building. Studies themes such as fascism, gender, violence, national identity, anti-Semitism, and mass culture.

HIST 5238 Weimar Cinema and the Great War
Credit: 3 | Lecture: 3 | Lab: 0
Study of selected German films from 1918 to 1931 as contributions to debates about rationality, gender, violence, national identity, and the human condition shaped by experiences of the First World War. A cross-disciplinary seminar that draws equally on film theory and history, psychoanalysis, philosophy, and cultural criticism.

HIST 5239 The Vietnam War in Film
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the Vietnam War in U.S. film and cultural artifact. Traces intersection of fact and fiction, evident in decades following the Vietnam War. Explores notions of mourning and memory and the way they relate to post-war experience.

HIST 5330 Memory and Representation in Holocaust Cinema
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of Holocaust memory and representation in American and European cinema. Students will use primary and secondary sources, including history, film, art, and philosophy.

HIST 5339 The Human Experience of War
Credit: 3 | Lecture: 3 | Lab: 0
Focus on a single historical war from the perspective of human experience rather than institutions, leadership and strategy. Topics vary; may be repeated for credit with permission of instructor.

HIST 5430 Studies in Women's History
Credit: 3 | Lecture: 3 | Lab: 0
Critical examination of major themes and issues in the history of women. Topics may vary; may be repeated for credit with the permission of instructor. Women's and Gender Studies course.

HIST 5431 Biography in European History
Credit: 3 | Lecture: 3 | Lab: 0
Examination of issues involved in researching and writing biographies of individuals from the European past. Students will read important biographies and write a partial biography.

HIST 5432 Studies in European History
Credit: 3 | Lecture: 3 | Lab: 0
Critical examination of major themes in the European past including historiographical analysis. Topics vary; may be repeated for credit with permission of instructor.

HIST 5433 Reformation Europe
Credit: 3 | Lecture: 3 | Lab: 0
A seminar which examines the Reformation movement in 16th-century Europe.

HIST 5434 Studies in Latin American History
Credit: 3 | Lecture: 3 | Lab: 0
Critical examination of major issues and themes in Latin American history. Topics vary; may be repeated for credit with permission of instructor. Offered only in the spring semester.
HIST 5438 Islamic Empires in World History
Credit: 3 | Lecture: 3 | Lab: 0
Explores the place of Islamic empires from the 8th century to the 20th in the longer trajectory of Mediterranean civilizations and as the interpreters of Persian-Greco-Roman traditions.

HIST 5439 Studies in Middle Eastern History
Credit: 3 | Lecture: 3 | Lab: 0
Critical examination of major issues and themes in Middle Eastern history. Topics vary; may be repeated for credit with permission of instructor.

HIST 5931 Research Topics in History
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

HIST 5939 Independent Study in History
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

HIST 6839 Master's Project Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, project director, and department chair required.

HIST 6909 History Comprehensive Exam
Credit: 0 | Lecture: 0 | Lab: 0
Comprehensive exam for students following Option 4 degree requirements.

HIST 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, thesis director, and department chair required.

HMRS Human Resource Management

HMRS 5131 Human Resource Management Processes
Credit: 3 | Lecture: 3 | Lab: 0
Theory and processes of effective development and management of human resources in organization.

HMRS 5231 Legal Environment of Human Resource Management I
Credit: 3 | Lecture: 3 | Lab: 0
The constitutional and procedural aspect of the employee/employer relationship with special reference to discrimination, wages and hours, pensions, unemployment insurance, health and safety and workers' compensation.

HMRS 5235 Project Management for HMRS
Credit: 3 | Lecture: 3 | Lab: 0
This course provides students with the tools for planning, setting budgets, tracking progress, and assessing the results of a human resource management project, including organizing project teams and using human resource metrics. This course has been designed to prepare students to introduce new HR initiatives, implement new development programs, "sell" new HR requirements, and institute new systems. Through basic Project Management skills, students will be able to create a sustained desired change, to learn and apply Intentional Change Theory, and to implement communication strategies developed through an understanding of multi-level complex systems.
HMRS 5433 Compensation and Benefits
Credit: 3 | Lecture: 3 | Lab: 0
Review and analysis of traditional and nontraditional compensation benefit systems.

HMRS 5435 Employee Planning, Staffing and Selection
Credit: 3 | Lecture: 3 | Lab: 0
Techniques for planning and recruiting human resource needs in the context of organizational requirements. Staffing and selection techniques and practice relative to organizational strategy, legal concerns, and labor market considerations. Prerequisites: HMRS 5131.

HMRS 5437 Human Resource Information Systems
Credit: 3 | Lecture: 3 | Lab: 0
Principles and procedures used in the development of information systems to aid human resource decision making.

HMRS 5531 Training and Development
Credit: 3 | Lecture: 3 | Lab: 0
An overview of personnel training and development in organizations to include program development.

HMRS 5533 HR Metrics and Performance Management
Credit: 3 | Lecture: 3 | Lab: 0
This course will provide the HR professional with the tools to become a true strategic partner with upper management. Students will learn how to use quantitative measures and performance management techniques to increase productivity, address problems and opportunities, and have a strategic impact on the organization. Prerequisites: HMRS 5131

HMRS 5931 Research Topics in Human Resources
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course if offered.

HMRS 5939 Independent Studies in Human Resources
Credit: 3 | Lecture: 3 | Lab: 0
Independent directed study in Human Resources. Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

HMRS 6735 Seminar in Human Resource Management
Credit: 3 | Lecture: 3 | Lab: 0
The concepts and practices of strategic human resource management including the development of frameworks to integrate human resource functions and the relationship between human resource strategies and business strategy with a focus on ethical and international issues. Prerequisites: Last Semester.

HMRS 6739 Internship in Human Resources
Credit: 3 | Lecture: 3 | Lab: 0
Supervised internship with a public or private agency; written and oral reports required. Prerequisites: Master's degree candidacy and approval of adviser and dean.

HMRS 6839 Master's Project Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Master's degree candidacy and approval of adviser and dean.

HMRS 6939 Master's Thesis Research
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Master's degree candidacy and approval of adviser and dean.
HUMN Humanities

HUMN 5030 History of Ideas I
Credit: 3 | Lecture: 3 | Lab: 0
This course is a graduate seminar exploring a major figure or theme in philosophy, literature, religion, or science in the period from ancient through medieval thought.

HUMN 5032 History of Ideas II
Credit: 3 | Lecture: 3 | Lab: 0
This course is a graduate seminar exploring a major figure or theme in philosophy, literature, religion, or science in the period from modern to recent thought.

HUMN 5034 Global Humanities I
Credit: 3 | Lecture: 3 | Lab: 0
Through an interrogation of epics, poems, and philosophical texts, this course enables students to arrive at alternative readings of pre-modern civilizations and worlds.

HUMN 5035 Texts and Images III
Credit: 3 | Lecture: 3 | Lab: 0
Origins and interplay of non-Western traditions; study of founding philosophical and religious traditions such as those of Asia, Africa, the Middle East, and Native America.

HUMN 5036 Global Humanities II
Credit: 3 | Lecture: 3 | Lab: 0
This course uses cultural theory and literary/filmic texts to help students develop a critical understanding of contemporary issues in the geopolitics of identity.

HUMN 5233 Art of Ancient Iraq and the Near East
Credit: 3 | Lecture: 3 | Lab: 0
Art History. The art, history, and culture of Ancient Iraq and the Near East. Topics include prehistoric art, state formation, ideology, and empire. (Cross-listed with ARTS 5233.)

HUMN 5234 Art of the Ancient Greek World
Credit: 3 | Lecture: 3 | Lab: 0
Art History. An introduction to art history and culture of ancient Greece, from the Bronze Age through the Hellenistic period. (Cross-listed with 5234.)

HUMN 5235 Museums and the Public
Credit: 3 | Lecture: 3 | Lab: 0
Art History. This course introduces students to the theory and operations, including strategies of display, collection management, accessions, and public relations, of fine arts museum. The course will include visits to local gallery and museum spaces.

HUMN 5236 Studies in Film
Credit: 3 | Lecture: 3 | Lab: 0
In-depth analysis of film texts from a topical, generic, historical perspective. Emphasis on theoretical approaches and individual research. Topics vary; may be repeated for credit with permission of instructor.

HUMN 5237 Studies in Art History
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Studies in art history, art theory, and criticism. Topics vary; may be repeated for credit.
HUMN 5238 World Cinema  
Credit: 3 | Lecture: 3 | Lab: 0  
This course empowers students to read cinema through the lens of feminist film theory at once addressing the spectacular, global reach, and intimate personal experience of movies.

HUMN 5239 Indian Cinema  
Credit: 3 | Lecture: 3 | Lab: 0  
This course aims to make its participants sophisticated readers and critics of Indian cinema by bringing into focus the major historical and cultural movements in the genre.

HUMN 5336 Philosophy in Religion  
Credit: 3 | Lecture: 3 | Lab: 0  
In–depth examination of issues in contemporary philosophy of religion. Emphasis on application of the logical tools of recent analytic philosophy to traditional questions relating to religion.

HUMN 5430 Issues in Art History I: Ancient to Modern  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course is a graduate–level investigation of the visual culture of the ancient Mediterranean world. Through the study of the artistic works of prior civilizations, students will develop skills in critical thinking, visual analysis, speaking, and writing about visual culture and society.

HUMN 5431 Issues in Art History II: Renaissance to the Present  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This is a lecture and discussion–based course which will serve as an introduction to critical issues of the discipline of art history. Course content will not be limited by geography or chronology, although the focus will be on the visual arts from the Renaissance to the Present; nor will this be a continuous survey. Instead, the course will examine case studies within major themes in order to develop critical modes of thinking, speaking, and writing about art.

HUMN 5732 Seminar in Women's Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
An advanced course in Women's and Gender Studies. Analysis and application of feminist theory across multiple disciplines. (Cross–listed with HUMN 4372, PSYC 4372, and PSYC 5732.)  
Prerequisites: Any other Women's and Gender Studies course.

HUMN 5931 Research Topics in Humanities  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by a specific title each time the course is offered. Topics vary; may be repeated for credit with permission of instructor.

HUMN 5939 Independent Study in Humanities  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.
HUMN 6639 Exhibition Capstone
Credit: 3 | Lecture: 0 | Lab: 0
The exhibition option allows Humanities MA students with a focus on Studio Arts to complete their work in a manner that best suits the plan of study and prepares them for careers in program-related areas. Work in the mode of exhibition follows a traditional, historical understanding of the Humanities experience, encouraging interdisciplinary study and allowing students to demonstrate expertise in their field(s) of interest.

HUMN 6739 Internship
Credit: 3 | Lecture: 0 | Lab: 0
Supervised internship in approved internship setting. Comprehensive written report required.

HUMN 6839 Master's Project Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, project director, and department chair required.

HUMN 6909 Humanities Comprehensive Exam
Credit: 0 | Lecture: 0 | Lab: 0
Comprehensive exam for students following Option 4 degree requirements.

HUMN 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, thesis director, and department chair required.

INDH Industrial Hygiene and Safety

INDH 4311 Noise and Hearing Conservation
Credit: 3 | Lecture: 3 | Lab: 0
Anatomy and physiology of the human ear; sound propagation and the mechanism of hearing loss; federal and state noise regulations; noise measurement and analysis; establishing a hearing conservation and noise control program in industry.

INDH 4313 Industrial Ventilation
Credit: 3 | Lecture: 3
General principles of ventilation, dilution ventilation, comfort ventilation; heat-cold stress control, hood design, air contaminant control; testing ventilation systems and industrial ventilation guidelines.

INDH 4316 System Safety and Accident Investigation
Credit: 3 | Lecture: 3
The course handles applications of system safety techniques in the industrial work environment and accident investigation theory and practice. Review of loss control management concepts, risk management, S & H training acceptance of risk, identification and initiation of corrective actions, pre-accident planning, emergency response, collection of evidence, analysis of information, investigation, organization, management and report writing.
INDH 4333 Construction and General Industry Safety
Credit: 3 | Lecture: 3
This covers safety and health principles in the construction and general industries as well as OSHA policies, procedures and standards. Special emphasis is placed on those areas that are most hazardous in construction and general industry.

INDH 5131 Control of Occupational and Environmental Hazards
Credit: 3 | Lecture: 3 | Lab: 0
Engineering and control technology used to eliminate and reduce hazards. Includes ventilation design, shielding, heat and cold stress, noise control, emissions control and waste management.
Prerequisites: INDH 4311, 4313, 4315 or equivalents.

INDH 5135 Statistical Analysis
Credit: 3 | Lecture: 3
Fundamental statistical concepts related to the applied industrial and environmental sciences: descriptive statistics; sampling; statistical distributions; confidence intervals, hypothesis testing; chi-square tests; correlation, simple and multiple linear regression; one-way ANOVA. Use of statistical software packages to analyze and present data.
Prerequisites: STAT 3308 or equivalent.

INDH 5233 Recognition of Occupational Diseases
Lecture: 0 | Lab: 1
Incidence and patterns of occupational diseases in the U.S. Approaches to recognition and prevention. Workplace exposures and effects. Occupational disorders by organ systems.
Prerequisites: BIOL 4325

INDH 5333 Air Pollution
Lecture: 0 | Lab: 1
Background, sources and fate of atmospheric pollutants. Air pollution episodes, meteorology, dispersion modeling, air quality measurements, controls, criteria, guidelines and health standards.

INDH 5334 Human Factors Engineering
Lecture: 0 | Lab: 1
Provides an analysis of the principles of human factors and ergonomics. The course covers human information processing, man-machine systems, information design, display and control design, static and dynamic anthropometrics and fundamentals of biomechanics, musculoskeletal injuries, including Cumulative Trauma Disorders such as Carpal Tunnel Syndrome, hand tool design, back injuries, vibrations, shift work, biological rhythms and workload assessment. Emphasis is placed on ergonomic methods and techniques to assess the design of modern work environments.

INDH 5335 Ergonomic Methods and Analysis Techniques
Lecture: 0 | Lab: 1
Provides students with a variety of methods to analyze tasks and make accommodations and redesigns based on the principles of human factors and ergonomics. Emphasis is placed on Human Factors/Ergonomic methods and techniques to assess the design of modern work environments to accommodate people with disabilities or provide suitable redesigns to enhance human performance.
INDH 5336 Safety, Health and Environmental Issues
Lecture: 0 | Lab: 1
Principles and concepts of environmental health and safety including essential information related to the recognition, evaluation and control of occupational and environmental hazards. Includes information related to public safety, the community, businesses, labs, government, education/research or other work environments.

INDH 5530 Research Methods: INDH
Credit: 3 | Lecture: 3
Development of proposal for master's project or thesis research.
Prerequisites: STAT 5135, adviser approval and approved research topic.

INDH 5739 Internship in Industrial Hygiene and Safety
Lecture: 0 | Lab: 1
Supervised work experience in an approved industrial firm or governmental agency. Written and oral report required.
Prerequisites: Master’s degree candidacy as well as approval by adviser and dean.

INDH 5915 Cooperative Education Work Term
Lecture: 0 | Lab: 1
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

INDH 5919 Independent Study in Industrial Hygiene & Safety
Lecture: 0 | Lab: 1
Prerequisites: Approval of instructor, chair and associate dean.

INDH 5931 Research Topics in Industrial Hygiene and Safety
Lecture: 0 | Lab: 1
Identified by specific title each time course is offered.

INDH 5939 Independent Study in Industrial Hygiene & Safety
Lecture: 0 | Lab: 1
Prerequisites: Approval of instructor, chair and associate dean.

INDH 6135 Radiation Protection
Lecture: 0 | Lab: 1
Advanced principles of ionizing and non-ionizing radiation are presented to provide the students who already have a basic understanding of radiation protection with an enhanced competence to solve theoretical and practical problems in radiation protection.

INDH 6232 Analytical Methods for Evaluation of Health Hazards
Lecture: 0 | Lab: 1
Survey procedures and instrumental methods of analysis for atmospheric and occupational hazards. Optical microscopy, noise, radiation, colorimetry, gas chromatography, atomic absorption, infrared and mass spectrometry.
Prerequisites: INDH 4322 or equivalent.
INDH 6332 Safety Engineering
Lecture: 0 | Lab: 1
Application of engineering principles to produce design, plant layout, construction, maintenance, pressure vessels, power tools, electric equipment, confined spaces and transportation systems. Includes consensus standards and governmental regulations. 
Prerequisites: INDH 3340 or equivalent.

INDH 6838 Research Project
Credit: 3 | Lecture: 3
Students complete their research project; write the research paper and present research findings in a public forum.
Prerequisites: INDH 5530, 24 hours completed within a CPS and approval of graduate adviser.

INST Instructional Technology

INST 3313 Survey of Instructional Technologies
Credit: 3 | Lecture: 3 | Lab: 0
Combines hands-on lab assignments and discussions through a student-centered approach. Students work with faculty to identify technology-related learning requirements, learning strategies and assessment criteria based on students' prior skills and interests. Students gain experience in the application of productivity tools, educational software, presentation graphics, multimedia and telecommunication technologies.
Prerequisites: Basic computer literacy.

INST 5031 Assistive-Adaptive Computer Applications
Credit: 3 | Lecture: 3 | Lab: 0
This course teaches the discipline and laws related to special education. Classroom models and resources will be created to support the design of instruction for students with disabilities.

INST 5035 Creating Digital Resources
Credit: 3 | Lecture: 3 | Lab: 0
In this introductory course, participants will learn about innovative trends in the field of instructional and communication technologies. Participants will create instructional products.
Prerequisites: Basic computer literacy.

INST 5130 Learning Theory and Instruction
Credit: 3 | Lecture: 3 | Lab: 0
Participants will identify and describe the salient characteristics of learning theories and cognitive science. Participants apply each theory to one or several learning environments.

INST 5131 Trends and Issues in Instructional Design and Technology
Credit: 3 | Lecture: 3 | Lab: 0
In this introductory course, participants will review the history and trajectory of instructional design & technology including media use, diffusion of innovations, principles, policies and regulations affecting implementation. Method: case studies and team projects.
Prerequisites: Basic computer literacy.
INST 5135 Multimedia Design Applications  
Credit: 3 | Lecture: 3 | Lab: 0  
This course introduces the instructional analysis, design, development, implementation, and evaluation and theoretical underpinnings of multimedia components as an instructional tool. The participants will design multimedia projects appropriate for online learning environments.

INST 5233 Performance Technology  
Credit: 3 | Lecture: 3 | Lab: 0  
This course enables learners to apply human performance improvement tools and techniques to identify performance problems and select potential solutions. Topics covered include: performance technology, non-instructional performance interventions, needs assessment, and change management.

INST 5333 Systematic Design of Technology-Based Instruction  
Credit: 3 | Lecture: 3 | Lab: 0  
Participants will apply systematic design procedures for training or instruction based on a combination of practical experience and instructional systems design theory and research. Participants will evaluate instructional delivery methods including instructor-led, print, and diverse electronic delivery systems.

INST 5433 Project Management for Instructional Projects  
Credit: 3 | Lecture: 3 | Lab: 0  
This course introduces basic project management processes including project phases and organization, client expectations, communications, time management, cost estimation, quality standards, and risk management. Students apply project management principles to instructional projects.

INST 5435 Grant Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
This course prepares learners to design and develop successful instructional grant proposals. Students will design project development and research plans for a proposed project of their choosing. Students will also create supporting material in order to submit a complete proposal narrative and budget for their proposed project. Students will explore resources for identifying instructional grant opportunities.

INST 5535 Internet for Instruction  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will plan and design online instructional materials and/or modules that effectively incorporate the Internet and address the social, ethical, legal, and human factors affecting the Internet as a communication, professional development, and lifelong learning tool.  
Prerequisites: Basic computer literacy.

INST 5635 Instructional Web Design and Development  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will learn to design and develop an instructional Web site by applying principles of educational psychology, communications theory, and fundamental principles of message design to create tables, frames, and interactive multimedia elements and forms in Web pages.
INST 5735 Advanced Web Development
Credit: 3 | Lecture: 3 | Lab: 0
This course is for experienced HTML programmers seeking to expand Web skills. Topics include programming in ASP, DHTML, connecting forms to databases, server setup, maintenance and management, and other current tools and applications. The course requires hands-on activities, group work, and the design, development and implementation of Web-based instructional modules.
Prerequisites: INST 5635.

INST 5835 Digital Video Production for Educators and Trainers
Credit: 3 | Lecture: 3 | Lab: 0
This course covers basic "Digital Video" pre-production, production and post-production. Students will develop and use a final edited video in either a multimedia presentation, on a Web site or in an instructional video.

INST 5919 Independent Study in Instructional Design and Technology
Credit: 1 | Lecture: 1 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

INST 5931 Research Topics in Instructional Design and Technology
Credit: 3 | Lecture: 3 | Lab: 0
Identified by title each time course is offered.

INST 5939 Independent Study in Instructional Design and Technology
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

INST 6031 Applications of Technology
Credit: 3 | Lecture: 3 | Lab: 0
Use interactive, communication, administrative and educational web-based software. Develop blogs, online courses, instructional videos, podcasts, rubrics, online tests, surveys, eportfolios, and organize information. Describe the relationship between educational technology and formal learning environments.
Prerequisites: Basic computer literacy.

INST 6037 Advanced Technology Applications
Credit: 3 | Lecture: 3 | Lab: 0
In this course, the student creates a variety of multimedia related concepts, including desktop publishing, video production, Web design, multimedia development and graphic design, and animation.
Prerequisites: Basic computer literacy.

INST 6137 Technology and e-Learning
Credit: 3 | Lecture: 3 | Lab: 0
This course links current research on human cognition with technological advances. This course also addresses how technology-rich learning environments must be grounded in educational psychology and cognitive science.

INST 6237 Advanced Instructional Design
Credit: 3 | Lecture: 3 | Lab: 0
This course covers a variety of analysis techniques, design theories, and design models.
Prerequisites: INST 5333.
INST 6337 Motivational Design of Instruction
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on systematic strategies that will enable teachers, trainers, and instructional designers to develop instruction that motivates students to learn. Students will examine theories of human motivation and learn how to apply the ARCS model of motivational design.

INST 6437 Interactive Distance Education
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the systematic design and delivery of interactive distance education programs based on the use of the Internet and related telecommunication technologies. Students design, develop, and formatively evaluate their own distance instruction, analyze research, and examine current trends and issues.

INST 6537 Management of Computer Resources
Credit: 3 | Lecture: 3 | Lab: 0
This course covers configuring, maintaining and trouble-shooting hardware, software, computer networks, and peripheral devices; the availability of emerging technologies and telecommunications; multimedia; and curriculum integration. Methods for maximizing the use of the technology in classrooms, in school libraries, and in computer labs will also be discussed.

INST 6637 Analyzing Emerging Uses of Technology
Credit: 3 | Lecture: 3 | Lab: 0
This is an advanced discussion on the instructional applications of emerging technologies. The purpose is to link research on emerging uses of technology to establish a direction of research selected by students. Students will analyze research and prepare annotated bibliographies and a review of literature.

INST 6737 Training Practicum
Credit: 3 | Lecture: 3 | Lab: 0
This course provides practical, hands-on experience in conducting needs assessment, designing and delivering technology training, supporting post-training performance, and evaluating real-life training situations for continuing adult education and development.

INST 6739 Instructional Technology Practicum
Credit: 3 | Lecture: 3 | Lab: 0
This is a supervised practice in educational computing under the guidance of a selected professor.
Prerequisites: Approval of associate dean, completion of all Professional Education Core courses, Instructional Technology Core courses, and at least one INST elective from the plan.
ISAM Information Systems Administration and Management

ISAM 5030 Fundamentals of Business Programming Applications
Credit: 3 | Lecture: 3 | Lab: 0
This course introduces fundamental principles in business applications programming using a high-level, business-oriented language. It includes topics in programming logic, design methodologies, graphical user interface programming and handling files. It also covers an introduction to object-oriented programming concepts. Includes numerous hands-on assignments.

ISAM 5330 Management Information Systems
Credit: 3 | Lecture: 3 | Lab: 0
Principles and procedures used in the development of information systems. The course includes a survey of hardware, software, network, database, e-commerce, functional information systems, organizational concepts, system analysis techniques and the system development life cycle. Includes a group project. (Previously ISAM 5631.)

ISAM 5331 Fundamentals of Databases and Business Intelligence
Credit: 3 | Lecture: 3 | Lab: 0
The topics covered include the following: (1) database concepts such as database models, modeling techniques and normalization; design, development, and maintenance of a relational database; formulation of commands to insert and update data, retrieve information, generate reports from a database; and (2) business intelligence concepts such as: business intelligence architecture; schema of a data warehouse; online analytical processing; big data; and NoSQL databases. Includes numerous hands-on assignments. (Cross-listed with ACCT 5333.)
Prerequisites: ISAM 5030 or 6 hours of college-level coursework in programming.

ISAM 5332 Data Warehousing and Data Mining
Credit: 3 | Lecture: 3 | Lab: 0
The course provides the knowledge and skills to design and develop a data warehouse as well as extract strategic business intelligence through the application of data mining tools and techniques. It examines phases of the data warehouse design process, and data aggregation. Includes numerous hands-on assignments.
Prerequisites: ISAM 5330 and 5331 or equivalent.
ISAM 5335 Advanced Applications Development with Visual Basic
Credit: 3 | Lecture: 3 | Lab: 0
The course covers concepts, tools and techniques used in developing Windows-based applications. It also presents structured programming, object-oriented programming and the use of graphical user interfaces. Includes numerous programming assignments. The coursework requirements also include a VB-based Microsoft professional certification. Prerequisites: ISAM 5030 or 6 hours of college-level programming courses.

ISAM 5337 Internet Applications Development
Credit: 3 | Lecture: 3 | Lab: 0
This course examines the design and development of business-oriented web applications using modern web technology standards, languages, and tools. Topics include markup languages, style, client-side scripts and site design techniques. Includes numerous hands-on assignments. Prerequisite: ISAM 5030 or 6 hours of college-level programming courses. Prerequisites: ISAM 5030 or 6 hours of College-level programming courses.

ISAM 5338 Advanced Internet Applications Development
Credit: 3 | Lecture: 3 | Lab: 0
The course focuses on the design and development of business-oriented web applications using modern web technology standards, languages, and tools. Client-side design and development topics include markup languages, style, and front-end frameworks. Server-side development topics cover HTTP request routing, server-side processing, authentication and security, web services and the use of databases. Includes numerous hands-on assignments. Prerequisites: ISAM 5331 and ISAM 5430, or equivalents.

ISAM 5339 Fundamentals of Computer Networking
Credit: 3 | Lecture: 3 | Lab: 0
The course introduces OSI and TCP/IP layered architectures and provides a detailed coverage of protocols in data link, network, transport and application layers. It gives a thorough coverage of addressing concepts and methodologies in computer networks, provides a detailed discussion of switched Ethernet networks, VLANs and the Spanning Tree Protocol. Includes numerous laboratory experiments using state-of-the-art computer networking equipment. Prerequisites: ISAM 5030 or 6 hours of college-level course work in computer programming.
ISAM 5430 Advanced Applications Development with C#
Credit: 3 | Lecture: 3 | Lab: 0
This course covers the following topics: application design and development using object-oriented techniques, the management of data, memory and other application resources, application communication and presentation concepts, and deployment, security and networking issues in applications. Completion of a professional certification exam is a required part of the course. (Formerly ISAM 5334 and ISAM 5340: credit will be given for only one of the courses: ISAM 5334, ISAM 5340 or ISAM 5430.)
Prerequisites: ISAM 5030 or 6 hours of college-level course work in computer programming.

ISAM 5431 ERP System Concepts and Practices
Credit: 3 | Lecture: 3 | Lab: 0
This course examines the integrated nature of business processes and how ERP systems can be configured to handle those processes. Students receive hands-on experience using SAP's current enterprise software. Prerequisites: ISAM 5330 or equivalent.
Prerequisites: ISAM 5330 or equivalent.

ISAM 5437 Wireless Networks
Credit: 3 | Lecture: 3 | Lab: 0
This course covers wireless network technologies used in computer networking. The topics covered includes wireless standards, radio frequency fundamentals, antennas, wireless encoding techniques, wireless LAN topologies, wireless MAC architecture, design, troubleshooting and security of wireless networks. The course includes numerous hands-on experiments using state-of-the-art equipment. The course requires the completion of professional certification.
Prerequisites: ISAM 5339 or equivalent.

ISAM 5439 Computer Network Security
Credit: 3 | Lecture: 3 | Lab: 0
The course covers security threats to computers and computer networks and methods to counter security threats including network firewalls; and designing, deploying and administering firewalls in IT organizations. Various firewall concepts such as VPNs, DMZs, NAT and intrusion detection methods are also explained. Includes numerous hands-on laboratory experiments using state-of-the-art firewall systems.
Prerequisites: ISAM 5339.
ISAM 5632 Advanced Database Applications Development
Credit: 3 | Lecture: 3 | Lab: 0
The course covers advanced commands and techniques to: design, develop and maintain a database; insert and update data in a database; retrieve information and generate reports; and develop and implement database objects to manage, control and administer database processing. Includes numerous hands-on assignments. The coursework requirements also include Oracle SQL and Oracle PL/SQL certification.
Prerequisites: ISAM 5030 or 6 hours of college-level course work in computer programming, and ISAM 5331 or equivalent.

ISAM 5633 Oracle Database Administration
Credit: 3 | Lecture: 3 | Lab: 0
This course introduces students to Oracle Database Administration. The topics covered include architecture of an Oracle database, installing Oracle database management system, creating a database, creating and managing database users and roles, database backup and recovery, database performance tuning and database administration. Includes numerous hands-on assignments.
Prerequisites: ISAM 5632 or equivalent.

ISAM 5635 Systems Analysis and Design
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a step-by-step approach to developing computer-based information systems. It covers topics such as systems development life cycle; systems development methodologies; system requirements determination and analysis; user-interface design; programs design; and system architecture. The course includes a comprehensive group project. It should be taken during the final semester of MS/MIS degree curriculum.
Prerequisites: ISAM 5330, ISAM 5331 or equivalents.

ISAM 5636 Advanced Computer Networking
Credit: 3 | Lecture: 3 | Lab: 0
The course covers skills to design and administer computer networks. It includes network routing protocols, packet filtering concepts, network and port address translation methods, wireless networks, new generation IP addressing, and wide area network protocols. Includes numerous hands-on lab experiments using state-of-the-art equipment. The course requirements include CCNA certification.
Prerequisites: ISAM 5339 or equivalent.

ISAM 5637 Information Systems Project Management
Credit: 3 | Lecture: 3 | Lab: 0
This course covers the concepts, tools and techniques used in managing information systems projects. It includes project integration, scope, time, cost, quality, human resources, communication, risk and procurement management. Includes a comprehensive group project using current information systems software tools.
Prerequisites: ISAM 5330 or equivalent
ISAM 5638 Advanced Applications Programming With Java  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers object-oriented programming using the Java programming language. It presents topics such as design methodologies, graphical user interface programming, applets, handling exceptions and I/O streams. Includes numerous hands-on programming assignments.  
**Prerequisites:** ISAM 5030 or at least 6 hours of programming courses.

ISAM 5639 SQL Server Database Administration  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers the architecture of a SQL Server database management system, creating a database, creating and managing database users and roles, database backup and recovery, database performance tuning and database administration. Includes numerous hands-on assignments.  
**Prerequisites:** ISAM 5331 or equivalent.

ISAM 5731 Information Systems Audit and Security  
Credit: 3 | Lecture: 3 | Lab: 0  
Discussion of the audit process, internal controls as they relate to technology, and business process documentation. Study of business processes, deployment and management of technology resources, risk assessment and change management, IT networks, and IT governance. Extensive hands-on experience detecting fraud using generalized audit software (IDEA). Discussion of computer forensics and other current topics related to IT security. Written communication skills are emphasized through the preparation of audit reports based on findings from fraud detection assignments. Covers topics tested in the Certified Information Systems Auditor (CISA) exam. (Cross-listed with ACCT 5335)  
**Prerequisites:** ISAM 5330 or equivalent.

ISAM 5734 Advanced Data Analytics in ERP System  
Credit: 3 | Lecture: 3 | Lab: 1  
This course covers topics such as data visualization, data analysis, reporting, and predictive analytics. Special attention will be given to discovering trends and other patterns from data. A significant portion of this course will deal with the use of SAP’s current enterprise software systems. Data will be analyzed using existing software packages and currently accepted analytical models.  
**Prerequisites:** ISAM 5330 or equivalent.
ISAM 5735 Data Analytics Application Development  
Credit: 3 | Lecture: 3 | Lab: 1  
The course provides students with a foundation of developing data analytics applications by using the most in-demand programming language and business intelligence tools. The course also includes a significant number of hands-on computational projects to help the students gain a thorough understanding of the practice of dealing with real-world big data, as well as prepare the students for different roles of data analytics application developers.  
Prerequisites: ISAM 5330 and 5331 or equivalents.

ISAM 5931 Research Topics in Management Information Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

ISAM 5939 Independent Studies in Management Information Systems  
Lecture: 3 | Lab: 0  
Independent directed study in Management Information Systems.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

ISAM 6739 Internship in Management Information Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
Supervised work experience related to management information systems with an approved business, industrial firm, or governmental agency. Written and oral reports as required  
Prerequisites: Master's degree candidacy, completion of foundation courses and at least 18 hours of MS in MIS required courses, and approval of academic adviser, faculty chair and associate dean.

LEGL Legal Studies

LEGL 5131 Legal Concepts for the Business Professional  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the legal implications of business transactions and will be of particular value to students seeking degrees in accounting, finance and business. Explores legal issues emphasized by the AICPA and other national professional organizations.

LEGL 5931 Research Topics in Legal Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

LITR Literature

LITR 3302 Principles of Composition  
Credit: 3 | Lecture: 3 | Lab: 0  
Advanced study of the principles of composition with emphasis on grammatical theory and analysis; discourse theory; and the cognitive, rhetorical, and linguistic aspects of writing; emphasis on recent developments in theory.
LITR 3334 Mythology  
Credit: 3 | Lecture: 3 | Lab: 0  
Greco-Roman and other selected mythological texts important in world literature, such as Homeric or Akkadian epic, the Eddas, the stories of the Arthurian cycle, and the Native American myths.

LITR 3361 Shakespeare  
Credit: 3 | Lecture: 3 | Lab: 0  
Shakespeare's major plays and their production in the theatre of the English Renaissance.

LITR 3371 Creative Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Practice and instruction in writing fiction, poetry, creative nonfiction, drama, and/or other genres. Exercises in creative process and workshop discussions of participants' work. Multi-genre survey (poetry, fiction, etc.) or single-genre topics course. May be repeated for credit with permission of instructor.  
Prerequisites: WRIT 1301 and WRIT 1302

LITR 4301 Literary Theory  
Credit: 3 | Lecture: 3 | Lab: 0  
Theories about the nature of verbal art and the relationship between literature and reality.  
Prerequisites: LITR 3301

LITR 4304 Workshop in Poetics  
Credit: 3 | Lecture: 3 | Lab: 0  
The language, formal strategy, and mechanical techniques of poetry. A practical sense of how poems work. Designed for teachers, readers, and writers of poetry.  
Prerequisites: LITR 3301

LITR 4320 The Romantic Movement in British Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Major Romantic poets and novelists: Coleridge, Wordsworth, Byron, Scott, Mary Shelley, Bronte, and others. Topics may include revolution and war, gender issues, rise of the individual colonialism, exoticism, science, or art.

LITR 4324 Rise and Development of the British Novel  
Credit: 3 | Lecture: 3 | Lab: 0  
Origins and development of the novel in English; major British novelists from the late 17th through the early 20th centuries, such as Behn, Defoe, Richardson, Austen, Dickens, Hardy, and Conrad.

LITR 4336 Contemporary American Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Diverse writings from recent decades; topics addressed may include revisions of traditional narrative; conformity and counter-culture; postmodernism; re-imagining ethnic, gender, national or planetary identity. Authors may include Toni Morrison, Thomas Pynchon, Colson Whitehead, and Lydia Davis.

LITR 4340 American Immigrant Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
America's fundamental narrative of immigration, the "American Dream" and its variations, told in voices from the Pilgrims through Jewish, European, Asian, Central American, and Caribbean writers of the 20th and 21st centuries.
LITR 4342 Modern and Contemporary Drama
Credit: 3 | Lecture: 3 | Lab: 0
A century of national and international playwrights from Henrik Ibsen and Anton Chekhov to Sam Shepard and August Wilson; realism, symbolism, expressionism, and theatre of the absurd.

LITR 4344 The Modern Novel
Credit: 3 | Lecture: 3 | Lab: 0
Major works of such novelists as Conrad, Joyce, Faulkner, Mann, and Garcia-Marquez.

LITR 4346 Medieval Literature
Credit: 3 | Lecture: 3 | Lab: 0
Romance, lyric, fabliau, epic, play, and story. Selections from such medieval masters as Dante; the Gawain, Tristan and Beowulf poets; Boccaccio; and Chretien de Troyes. Texts will be read in translation.

LITR 4360 Film as Literature
Credit: 3 | Lecture: 3 | Lab: 0
Understanding films through the language of film (shots, montage, framing, lighting, sound, genre, classical Hollywood, and avant-garde). Film interpretation and critique.

LITR 4362 The Literature of Adolescence
Credit: 3 | Lecture: 3 | Lab: 0
Growing up: variance and continuity in depictions of adolescence by American and other writers.

LITR 4364 Women in Literature
Credit: 3 | Lecture: 3 | Lab: 0
Heroines from Eve to Molly Bloom; how literature constructs the female; emphasis on 19th- and 20th-century works. Women's Studies Course.

LITR 4368 Literature of the Future
Credit: 3 | Lecture: 3 | Lab: 0
Apocalyptic, evolutionary, and alternative narratives for literature depicting human society in the near and deep future; genres include classic and current science fiction, prophecy, utopias, dystopias, and ecotopias.

LITR 4370 Tragedy
Credit: 3 | Lecture: 3 | Lab: 0
The dimensions of tragic experience as expressed in Western literature.

LITR 5034 Workshop in Poetics
Credit: 3 | Lecture: 3 | Lab: 0
A comprehensive consideration of elements, mechanics, and compositional strategies in English language poetry; bases for evaluation of both traditional and free verse forms; some attention to the development of the poetic tradition in English since the Middle Ages.

LITR 5039 Editing
Credit: 3 | Lecture: 3 | Lab: 0
The interpersonal and linguistic skills required for editing. Students will learn to make documents highly readable by revising for content, mechanics, style, visual design, organization, illustrations, tables, and documentation. Students may also be expected to publish a literary magazine.

LITR 5130 Composition: Theory and Practice
Credit: 3 | Lecture: 3 | Lab: 0
Workshop in approaches to the teaching process; emphasis on composition theory, techniques for teaching description, narration, exposition, syntax, and grammar.
LITR 5131 Studies in Composition and Rhetoric  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

LITR 5132 Literary Theory  
Credit: 3 | Lecture: 3 | Lab: 0  
History of main theories of literature; selected concepts, technical constructs, schools of criticism and theory. Literature M.A. candidates must take during first year of graduate work.

LITR 5430 Creative Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Seminar in writing fiction, poetry, drama, or creative nonfiction. Topics vary; may be repeated for credit when genre varies.

LITR 5431 American Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Seminar focused on a particular style, period, genre, or topic in American literature; e.g., Romanticism, Realism, Modernism; fiction, poetry; drama; the city, the frontier. Topics vary; may be repeated for credit.

LITR 5434 British Literature – Pre-Restoration  
Credit: 3 | Lecture: 3 | Lab: 0  
Seminar focused on a particular author, period or genre, for instance Chaucer, Shakespeare, Spenser, and Milton; women's writing. Topics vary; may be repeated for credit.

LITR 5435 British Literature – Restoration to the Present  
Credit: 3 | Lecture: 3 | Lab: 0  
Seminar focused on a particular period or genre, for instance Restoration, 18th Century, Romantic, Victorian, Modern: poetry or the novel. Topics vary; may be repeated for credit.

LITR 5436 Major Authors  
Credit: 3 | Lecture: 3 | Lab: 0  
Intensive study of one or more authors influential in American, English, or world literature. For instance: Euripides, Dante, Dickinson, George Eliot, or Walcott. Topics vary; may be repeated for credit.

LITR 5437 Literature and Culture  
Credit: 3 | Lecture: 3 | Lab: 0  
Seminar on interdisciplinary approaches to the study of texts within cultures. Topics vary; may be repeated for credit when content varies.

LITR 5438 Literature and Gender  
Credit: 3 | Lecture: 3 | Lab: 0  
Seminar on texts exploring gender issues. Examination of a range of theoretical approaches to such topics as gender and identity; gender, class, and race; feminist theory; or gendered literary traditions. Topics vary; may be repeated for credit.

LITR 5439 Genre, Movement, or Style  
Credit: 3 | Lecture: 3 | Lab: 0  
Intensive study of a particular literary genre, movement, or style such as Romanticism, Surrealism, the Gothic, the short story, the epic, confessional poetry, mysteries and detective stories, or magical realism. Topics vary; may be repeated for credit.

LITR 5831 World/Multicultural Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey or in-depth focus on a nation's, region's, culture's, or diaspora's literature, potentially in dialogue with other literary traditions. Topics may include Postcolonial Literature, Literature of India, American Minority or Immigrant Literature, and others. Topics vary; may be repeated for credit.
LITR 5931 Research Topics in Literature
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

LITR 5939 Independent Study in Literature
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

LITR 6739 Graduate Internship
Credit: 3 | Lecture: 0 | Lab: 0
Supervised composition internship in an approved setting. Comprehensive written report required.
Prerequisites: LITR 5130, LITR 5739 and one semester tutoring in the Writing Center.

LITR 6909 Literature Comprehensive Exam
Credit: 0 | Lecture: 0 | Lab: 0
Comprehensive exam for students following Option 4 degree requirements.

LITR 6939 Master's Thesis Research
Credit: 3 | Lecture: 0 | Lab: 0
Approval of adviser, thesis director, and department chair required.

LLLS 4311 Survey of Reading
Credit: 3 | Lecture: 3 | Lab: 0
Theories and approaches to teaching reading from emergent to proficient reading including word recognition skills, phonemic awareness, vocabulary development, comprehension, materials and methods for structuring of reading programs.

LLLS 4312 Literacy Issues of Secondary Students
Credit: 3 | Lecture: 3 | Lab: 0
Theories and approaches for teaching reading in intermediate and high school. Field experiences required.

LLLS 4344 Reading & Writing for EC-6
Credit: 3 | Lecture: 3 | Lab: 0
Application of theories and strategies for teaching the language arts for EC-6. Field experiences required.
Prerequisites: LLLS 4311 or equivalent.

LLLS 4345 Survey of Children's Literature
Credit: 3 | Lecture: 3 | Lab: 0
Survey of literature for children focusing on titles appropriate for grades EC-8 students.

LLLS 4346 Teaching Language Arts in the 4-8 Classroom
Credit: 3 | Lecture: 3 | Lab: 0
Application of theories and strategies for teaching the language arts for students in grades 4-8. Field experiences required.

LLLS 4351 Reading in Content Subjects
Credit: 3 | Lecture: 3 | Lab: 0
Survey of current reading and writing development in content subjects.

LLLS 4352 Young Adult Literature and Reading
Credit: 3 | Lecture: 3 | Lab: 0
Selection and use of literature for young adults, focusing on titles appropriate for students in grades 8-12.
LLLS 4364 Methods in Secondary English/Language Arts  
Credit: 3 | Lecture: 3 | Lab: 0  
Implementation of instructional plans and teaching strategies. Review of current research, theories and exemplary practices of teaching secondary English/Language Arts. Field experiences required.  
Prerequisites: Admission to Teacher Education.

LLLS 5010 Professional Preparation Seminar for Reading Specialists  
Credit: 1 | Lecture: 1 | Lab: 0  
This course is designed to assist students in the Reading Specialist certification plan to understand the state certification standards for successful entry into their chosen fields. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plans.  
Prerequisites: An approved, signed degree plan on file in the COE.

LLLS 5131 Integrating the Language Arts  
Credit: 3 | Lecture: 3 | Lab: 0  
This course discusses advanced approaches to literacy instruction in the EC-8 classroom. Field experience is required.

LLLS 5133 Foundations of Reading  
Credit: 3 | Lecture: 3 | Lab: 0  
This course discusses historical, philosophical, physiological, and psychological foundations of reading.

LLLS 5134 Developmental Reading Programs for EC-8  
Credit: 3 | Lecture: 3 | Lab: 0  
This course discusses the structuring of developmental reading programs, emphasizing alternative approaches.

LLLS 5135 Developmental Reading Programs for Secondary Schools  
Credit: 3 | Lecture: 3 | Lab: 0  
This course discusses the analysis of model reading programs in grades 4-12 emphasizing alternative approaches to teaching, materials, and instructional strategies.

LLLS 5137 Modern Trends in Literature for Children and Young Adults  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines current trends and issues in the literature published for children and young adults.

LLLS 5531 Critical Reading and Thinking  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is about applying higher order thinking skills to reading in literature and the content areas.

LLLS 5532 Selecting Literature and Materials for Young Adults  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is about the selection, evaluation, and strategies for use of literature in grades 8-12, including print and digital reading materials and other resources.

LLLS 5533 Selecting Literature and Materials for Children  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the application of higher order thinking skills to reading in literature and the content areas.
LLLS 5534 Foundations in Secondary Literacy
Credit: 3 | Lecture: 3 | Lab: 0
This course is about theories and practices of secondary reading and writing, reader response theory and physiological and psychological foundations of secondary reading in grades 4–12.

LLLS 5633 Teaching Methods for English/Reading Language Arts for Grades 4–8
Credit: 3 | Lecture: 3 | Lab: 0
This course is about the implementation of English/Reading/Language Arts teaching methodologies for grades 4–8 based upon application of theory and practice. Field experience is required for non-certified students.

LLLS 5634 Teaching Methods for English/Reading Language Arts Grades 7–12
Credit: 3 | Lecture: 3 | Lab: 0
This course is about the implementation of English/reading language arts teaching methodologies for grades 7–12 based upon application of theory and practice. Field experiences required.
Prerequisites: Admission to Teacher Education Program.

LLLS 5635 The Teaching of Writing
Credit: 3 | Lecture: 3 | Lab: 0
This course is about teaching writing skills and improving student writing in grades K–12 using a process approach; instructional strategies based upon theory and current research.

LLLS 5738 Foundations of Early Literacy
Credit: 3 | Lecture: 3 | Lab: 0
This course is about the theories and practices of early literacy development, including phonics, phonemic awareness, early writing development, and speaking and listening. This course includes training for leadership in early literacy practices.

LLLS 5931 Research Topics in Literacy, Language and Library Science
Credit: 3 | Lecture: 3 | Lab: 0
Identified by title each time course is offered.

LLLS 5939 Independent Study in Literacy, Language and Library Science
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

LLLS 6134 School Library Collection Development Management
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the philosophy, principles, and fundamentals of school library collection management including selection, acquisition, cataloging, circulation, and deselection of print and non-print materials.

LLLS 6136 Librarians as Instructional Partners
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the principles and fundamentals of collaborative planning and instruction in the school library.
Prerequisites: LLLS 6336

LLLS 6234 Librarians Empowering Learners Through Advocacy Leadership
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the principles and methods of creating dynamic school library programs through collaboration with teachers, administrators, librarians, and the community.
LLLS 6331 Sociolinguistic Applications to Reading
Credit: 3 | Lecture: 3 | Lab: 0
This course examines sociolinguistic models and concepts, the study of language in educational settings, and language differences applied to reading instruction.

LLLS 6332 Foundations of Early and Secondary Literacy
Credit: 3 | Lecture: 3 | Lab: 0
This course examines theories and practices of literacy development from the early grades through the secondary grades.

LLLS 6333 Genre Studies in Children's Young Adult Literature
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the identification, exploration, and evaluation of the various genres in children's and young adult literature and how genre studies can be utilized in reading programs that motivate and engage young readers.

LLLS 6334 Administration of School Library Services
Credit: 3 | Lecture: 3 | Lab: 0
This course exams the principles and illustrative practices in the organization, budgeting, policy making, facilities planning, and staffing of school libraries.

LLLS 6336 Media and Technology Selection and Application
Credit: 3 | Lecture: 3 | Lab: 0
This course is about the selection, evaluation, application, and integration of educational technologies and applications, including the design and production of media in school libraries.

LLLS 6338 School Library Systems & Services
Credit: 3 | Lecture: 3 | Lab: 0
This course is an introduction and evaluation of the current library reference, information, and retrieval systems and their applications in school libraries.

LLLS 6639 Leadership in Clinical Practices in Assessment of Literacy Tasks
Credit: 3 | Lecture: 3 | Lab: 0
This course includes advanced techniques in assessment and strategies for literacy intervention. Includes practice in literacy supervision. Field experiences required.

LLLS 6732 Assessment and Remediation of Reading and Language Arts Literacy
Credit: 3 | Lecture: 3 | Lab: 0
This course is practice in assessment and remediation of literacy, including simulated and laboratory practice in administration, interpretation, and evaluation of literacy assessment instruments and practice with a multiplicity of reading/language arts strategies for literacy development, including dyslexia and related disorders. 
Prerequisites: Six hours of Reading course work.

LLLS 6739 School Library Practicum
Credit: 3 | Lecture: 3 | Lab: 0
Supervised field experiences in EC-12, incorporating information skills instruction and practice in school library management. 
Prerequisites: Completion of 18 hours in the School Library Core and approval of the associate dean.
LLLS 6839 Practicum in School Literacy Practices
Credit: 3 | Lecture: 3 | Lab: 0
Supervised field experiences with literacy teachers in EC-12 accredited schools.
*Prerequisites: Prerequisite: 12 hours reading course work including LLLS 6732.*

**MATH Mathematics**

**MATH 2305 Discrete Mathematics**
Lecture: 3
Introductory mathematical logic, mathematical induction, relations and functions, basic counting techniques, graphs and trees and applications to computing devices. Designed for students majoring in the computer related disciplines.
*Prerequisites: MATH 2413 or MATH 1325.*

**MATH 2315 Calculus III**
Credit: 3 | Lecture: 3
Vectors and vector valued functions, functions of multiple variables, partial derivatives, multiple integrals, volume and surface area and vector calculus.
*Prerequisites: MATH 2414*

**MATH 2318 Linear Algebra**
Credit: 3 | Lecture: 3
Systems of linear equations; vector spaces, linear transformations, determinants, matrices, eigenvalues and eigenvectors; applications to coding and difference equations.
*Prerequisites: MATH 2412 or MATH 2413*

**MATH 2320 Differential Equations**
Credit: 3 | Lecture: 3
Solutions of ordinary differential equations of the first and second order, Laplace transforms, power series techniques, systems of equations, stability, numerical methods, geometric and physical applications.
*Prerequisites: MATH 2414*

**MATH 2413 Calculus I**
Credit: 4 | Lecture: 4
Limits and continuity; the Fundamental Theorem of Calculus; definition of the derivative of a function and techniques of differentiation; applications of the derivative to maximizing or minimizing a function; the chain rule, mean value theorem and rate of change problems; curve sketching; definite and indefinite integration of algebraic, trigonometric and transcendental functions with an application to calculation of areas.
*Prerequisites: MATH 2412 with a C- or better or meet requirement in UHCL Mathematics Department Placement and Testing policy.*

**MATH 2414 Calculus II**
Lecture: 4
Differentiation and integration of transcendental functions; parametric equations and polar coordinates; techniques of integration; sequences and series; improper integrals.
*Prerequisites: MATH 2413 with a C- or better or meet requirement in UHCL Mathematics Department Placement and Testing policy.*
MATH 3301 History of Mathematical Sciences
Credit: 3 | Lecture: 3
Temporal relationships of concepts by means of biographic studies; development of mathematical theory and applications from ancient to contemporary times.
Prerequisites: MATH 1314 or MATH 1324 or MATH 1332

MATH 3304 Algebra Through Technology
Credit: 3 | Lecture: 3
Using technology topics in elementary functions, simultaneous equations, polynomials and elementary topics in number theory. This course for Teaching Certification students only.
Prerequisites: MATH 1314

MATH 3305 Euclidian / Non-Euclidian Geometry
Credit: 3 | Lecture: 3
Formal set theory, logical structure and measurement.
Prerequisites: MATH 1314

MATH 3306 Problem Solving
Credit: 3 | Lecture: 3
Problem solving through experiences and reasoning; ideas from areas such as pattern recognition, simulation and logical deduction.
Prerequisites: MATH 1351, MATH 3304, or equivalent or instructor permission

MATH 4313 Introduction to Topology
Credit: 3 | Lecture: 3
Topological techniques in analysis, metric spaces, continuous transformations, connectivity, separation, compactness; nets and filters, cardinal arithmetic.
Prerequisites: MATH 3331.

MATH 4315 Numerical Analysis and its Applications
Credit: 3 | Lecture: 3
Introduction to methods and algorithms in numerical computation. The topics include techniques for finding the roots of equations and interpolation functions, numerical approximation of differentiation and integration, numerical solutions to ordinary differential equations, linear systems and nonlinear systems.
Prerequisites: MATH 2315, MATH 2318, MATH 2320 and C/C++ or equivalent.

MATH 4316 Mathematic Software Applications
Credit: 3 | Lecture: 3
This course covers a number of applied mathematics models through scientific software simulators; Matlab and Mathematica, Symbolic, numerical and graphical simulations and symbolic operations will be applied to various mathematical problems normally viewed as beyond the scope of the course in which they are first introduced. A variety of programming paradigms, such as procedural programming and function programming will be emphasized.
Prerequisites: MATH 2318, MATH 2320, CSCI 1318 or a scientific programming language.

MATH 4321 Predicate Logic
Credit: 3 | Lecture: 3
An introduction to predicate logic; elements of formal logic systems; set theory and propositional calculus, completeness theorems and the nature of proofs.
MATH 4322 Introduction to Abstract Algebra  
Credit: 3 | Lecture: 3  
Study of algebraic structures: maps, operations, permutations and homomorphisms. Groups, rings, integral domains and fields; applications to symmetry; techniques of mathematical proof.  
**Prerequisites:** MATH 3312 or MATH 3331.

MATH 4325 Theory of Models and Applications  
Credit: 3 | Lecture: 3  
Simulation and analysis on continuous and discrete mathematical models in science. It also includes the study of nonlinear dynamics, chaos and fractals.  
**Prerequisites:** MATH 2318 and MATH 2320 or equivalent.

MATH 4341 Introduction to Analysis  
Credit: 3 | Lecture: 3  
Real numbers, sequences and series, differentiation and measure theory; Riemann, Stieltjes and Lebesgue integrals.  
**Prerequisites:** MATH 3331 or equivalent.

MATH 4345 Introduction to Statistics  
Credit: 3 | Lecture: 3  
Sampling distributions, point and interval estimation, hypothesis testing, regression and correlation, nonparametric statistics, analysis of variance.  
**Prerequisites:** MATH/STAT 4344

MATH 5031 Problem-Solving Strategies  
Credit: 3 | Lecture: 3  
This course focuses on the connection between problem-solving, teaching mathematics for understanding and the development of mathematical reasoning. Also highlighted will be the student's own development of problem-solving abilities and ability to communicate their reasoning.

MATH 5033 Instructional Applications of Algebra  
Lecture: 0 | Lab: 1  
A seminar on the content of secondary school courses in algebra and applicable instructional techniques.

MATH 5034 Geometry Seminar  
Credit: 3 | Lecture: 3  
Topics in Euclidean and Non-Euclidean geometries with a focus on the teaching and learning of geometry (including the use of technology and concrete materials). Development of proof-writing techniques in geometry included.  
**Prerequisites:** MATH 3305 or equivalent.

MATH 5035 Precalculus Courses for Mathematics Teachers of Grades 10–14  
Lecture: 0 | Lab: 1  
A seminar on various current and potential approaches to the content of precalculus mathematics with applicable instructional techniques.

MATH 5036 Calculus for Mathematics Teachers of Grades 10–14  
Lecture: 0 | Lab: 1  
A seminar on various approaches to the teaching of introductory calculus.
MATH 5037 Technology for Mathematics Curriculum  
Credit: 3 | Lecture: 3  
Current laboratory applications of computers and calculators in the mathematics curriculum. Symbolic, numerical and graphical computing will be applied to various mathematical problems.  
Prerequisites: Minimum College Algebra competency. Calculus and Pre-Calculus strongly preferred.

MATH 5131 Abstract Algebra  
Lecture: 0 | Lab: 1  
Groups, rings, fields, modules; ideal theory, polynomial rings, algebraic and free groups.  
Prerequisites: MATH 4322 or equivalent.

MATH 5132 Real Analysis  
Lecture: 0 | Lab: 1  
General measure and integration theory. Banach and Hilbert spaces; applications to approximation theory, probability theory and summability.  
Prerequisites: MATH 4341 or equivalent.

MATH 5133 Complex Analysis  
Lecture: 0 | Lab: 1  
The theory of analytic functions and analytic continuation. Branched functions; an introduction to homotopy theory and basic metric space topology. Integration theory, Cauchy's theorem and residue theory.  
Prerequisites: MATH 4363 or equivalent.

MATH 5134 Logic  
Lecture: 0 | Lab: 1  
Propositional and predicate calculus; foundations, computability.  
Prerequisites: MATH 4321 or equivalent.

MATH 5136 Ordinary Differential Equations and Dynamical Systems  
Lecture: 0 | Lab: 1  
This course covers the dynamical aspects of ordinary differential equations and the relationship between theory and applications. Fundamental theorems of solutions of ordinary differential equations oriented toward dynamical systems, local phase portrait analyses of nonlinear autonomous systems and the criteria for the existence of periodic solutions are examined along with various applications.  
Prerequisites: MATH 2318, MATH 3321 and MATH 4311 or equivalent.

MATH 5137 Topology and Geometry  
Lecture: 0 | Lab: 1  
Set Theory, Topological Spaces, Connectedness and Compactness, The Fundamental Group and Covering Spaces, Surfaces and their applications.  
Prerequisites: MATH 4313 or equivalent.

MATH 5231 Linear Algebra  
Lecture: 0 | Lab: 1  
Fields and vector spaces, determinants and their characterization, adjoints operators, eigenvalues and eigenvectors, diagonalizability, canonical forms and matrix functions.  
Prerequisites: MATH 2318.
MATH 5232 Number Theory
Lecture: 0 | Lab: 1
An introduction to analytic number theory, which uses the tools of analysis (particularly complex function theory) to investigate questions in number theory. The distribution of the primes is of central interest. Some of the tools developed are Dirichlet series, character theory, formal power series and contour integration. Various topics in arithmetical functions are also considered.
Prerequisites: MATH 4312 or equivalent.

MATH 5330 Mathematical Software and Modeling Simulation
Lecture: 0 | Lab: 1
Explores computer software in applied Mathematics using Matlab. A variety of programming paradigms are emphasized. A collection of topics in applied Mathematics, chaos and neuroscience modelings, are incorporated into Matlab programming.
Prerequisites: MATH 2318 and MATH 2320 or equivalent.

MATH 5333 Numerical Analysis
Lecture: 0 | Lab: 1
Mathematical analysis and numerical computation of solutions to linear and nonlinear systems, ordinary differential equations, integral equations and boundary value problems.
Prerequisites: MATH 2318, MATH 2415, MATH 2320 and C/C++ or equivalent.

MATH 5431 Mathematical Neuroscience
Credit: 3 | Lecture: 3
Techniques for analyzing and simulating physical, chemical and biological processes.
Prerequisites: MATH 4325 or equivalent.

MATH 5432 Optimization
Credit: 3 | Lecture: 3
This course is intended to cover central concepts of practical optimization techniques on linear and nonlinear programming, such as simplex methods, primal and dual methods, steepest descent methods, conjugate direction methods, quasi-Newton methods, penalty and barrier methods, etc. The application of optimization in engineering, business, management science, and statistics are also introduced.
Prerequisites: MATH 2318.

MATH 5739 Internship in Mathematics
Credit: 3 | Lecture: 3
Supervised work experience in an approved industrial or government agency. Written and oral report required.

MATH 5931 Research Topics in Mathematics
Lecture: 0 | Lab: 1
Identified by specific title each time course is offered.

MATH 5939 Independent Study in Mathematics
Lecture: 0 | Lab: 1
Prerequisites: Approval of instructor, chair and associate dean.

MATH 6031 Problem Solving Strategies
Credit: 3 | Lecture: 3
A focus on the connection between problem-solving, teaching mathematics for understanding and the development of mathematical reasoning. Also highlighted will be the student's own development of problem solving abilities and ability to communicate their reasoning.
MATH 6033 Instructional Applications of Algebra
Credit: 3 | Lecture: 3
A seminar on the content of secondary school courses in algebra and applicable instructional techniques.

MATH 6034 Geometry Seminar
Credit: 3 | Lecture: 3
Topics in Euclidean and Non-Euclidean geometries. An emphasis on the strengthening of proof-writing techniques. Also discussed will be the use of technology and concrete materials in the teaching and learning of geometry.
Prerequisites: MATH 3305 or equivalent.

MATH 6035 Precalculus Courses for Mathematics Teachers of Grades 10–14
Credit: 3 | Lecture: 3
A seminar on various current and potential approaches to the content of precalculus mathematics with applicable instructional techniques.

MATH 6036 Calculus for Mathematics Teachers of Grades 10–14
Credit: 3 | Lecture: 3
A seminar on various approaches to the teaching of introductory calculus.

MATH 6037 Technology for Mathematics Curriculum
Credit: 3 | Lecture: 3
Current laboratory applications of computers and calculators in the mathematics curriculum. Symbolic, numerical and graphical computing will be applied to various mathematical problems.
Prerequisites: MATH 2413, MATH 2318 and MATH 4311.

MATH 6131 Introduction to Algebraic Topology and Geometry
Lecture: 0 | Lab: 1
An introduction to topics in algebraic topology; manifold theory and their applications.
Prerequisites: MATH 4313 or equivalent.

MATH 6837 Research Project I
Lecture: 0 | Lab: 1
Student will develop and complete a research project which requires integrating knowledge and standard procedures in the discipline. A written paper and presentation will be required.

MATH 6838 Research Project II
Lecture: 0 | Lab: 1
Student will complete research project developed in MATH 6837. A written paper and presentation will be required.

MATH 6939 Master's Thesis Research
Lecture: 0 | Lab: 1
Prerequisites: Approval of faculty adviser, master's committee and dean.

MGMT Management

MGMT 3301 Management Theory and Practice
Credit: 3 | Lecture: 3
Management policies and processes including planning, organizing and controlling; overview of the functions of organization theory and behavior.
MGMT 4354 Organizational Behavior Theory and Application
Credit: 3 | Lecture: 3
Exploring the dynamics of human behavior in organizations in order to better understand and evaluate how people and groups in organizations behave, react, and interpret events, and to apply these concepts successfully in a management context.

Prerequisites: MGMT 3301 or equivalent.

MGMT 5032 Human Behavior in Organizations
Credit: 3 | Lecture: 3 | Lab: 0
Behavioral problems associated with innovation, resistance to change and the development of complex organizations and administrative processes. Formerly MGMT 5132; Credit may not be received for both MGMT 5132 and MGMT 5032.

MGMT 5133 Teamwork and Leadership Skills: Theory in Practice
Credit: 3 | Lecture: 3 | Lab: 0
Focus on knowledge-based skill and competency development in effective teamwork, teambuilding, and leadership as well as diagnosing and intervening effectively in problematic team situations. Formerly MGMT 5031; Credit may not be received for both MGMT 5031 and MGMT 5133. Recommended that it be taken early in the MBA program.

MGMT 5135 Organizational Transformation, Learning, and Design
Credit: 3 | Lecture: 3 | Lab: 0
Seminar in contemporary research and theory applicable to structure and design of organizations, with emphasis upon institutional development, design science, and organizational learning.

Prerequisites: MGMT 5032 or equivalent.

MGMT 5233 Entrepreneurship and Corporate Venturing
Credit: 3 | Lecture: 3 | Lab: 0
This course is based on the premise that new ventures are a continuous source of radical or disruptive innovations in the United States. Technology entrepreneurship, whether in a start-up or established company, involves identifying high-growth potential, technology-intensive commercial opportunities, acquiring human and financial resources, and navigating uncertainty. This course offers students two entrepreneurial perspectives: new firm and intra-preneurship (e.g., corporate venturing). From the new firm perspective, students will examine how to identify and evaluate technological opportunities, form new ventures, and manage them. From the corporate venturing perspective, students will learn opportunity and feasibility analyses, how to structure the new venture, and manage high-growth projects. The goal of this course is to provide students with the tools to develop a successful business plan, build a start-up team, finance the venture, and lead the process of turning the opportunity into a reality.
MGMT 5234 Leading Non-Profit Institutions
Credit: 3 | Lecture: 3 | Lab: 0
This course will cover leadership in non-profit organizations. Topics include transformational leadership, communicating vision, enrollment, attentive listening, evaluating programs, and acknowledgement and appreciation.

MGMT 5238 Gender and Diversity Issues in Leadership
Credit: 3 | Lecture: 3 | Lab: 0
This course responds to recent demographic changes and opportunities presented by a diverse workforce. The challenges faced by organizational leaders on how to effectively manage a workforce that is increasingly diverse along the lines of race, ethnicity, gender, physical ability, cultural background, and age will be emphasized.

MGMT 5332 Labor Relations
Credit: 3 | Lecture: 3 | Lab: 0
Relationships between unions and management and the structure of industrial bargaining; legal dimensions of employee relations, strikes and settlements.
Prerequisites: MGMT 5032 or equivalent.

MGMT 5434 Negotiation Skills and Strategies
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a basic foundation in negotiation theory and practice. Analytical and interpersonal competencies are honed in the context of negotiation simulations and discussions using a variety of settings and media while reflecting on the global context of negotiations that routinely take place within (and between) organizations. Includes the development of a "Negotiation Dossier" that students would routinely compile in preparation for a typical negotiation in their chosen field.

MGMT 5437 International Leadership and Influence
Credit: 3 | Lecture: 3 | Lab: 0
This course will focus on the similarities and differences in leadership processes as a function of national origin, language, and dimensions of culture as inhibitors and driving forces of effective leadership in global organizations.

MGMT 5439 Positive Leadership and Ethical Action
Credit: 3 | Lecture: 3 | Lab: 0
This course explores the impact of emerging areas of positive psychology, positive organizational behavior, and positive organizational scholarship on the field of leadership, and how attributes of positive leadership influence leaders' ethical actions and decision-making.
Prerequisites: MGMT 5032.
MGMT 5636 Management of Technology  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to introduce a broad range of topics and issues related to the management of technology and technological innovation. The course includes discussions of technology development in industry, academia and government; the process of innovation; the drivers of innovation in a global environment; organizing and leading innovation; and incorporating technology change into company structure and strategy.  
*Prerequisites:* MGMT 5032 or equivalent.

MGMT 5638 Leading Technology  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will focus on the necessary leadership requirements and strategies to lead scientific and commercial projects. It focuses upon leadership capacities in the selection, development, and the effective management of scientists, engineers, biomedical personnel, and technical professionals. Topics will include leading change, top level project leadership, and organizational behavior and enterprise management principles applicable to science and technology.  
*Prerequisites:* MGMT 5032 or equivalent.

MGMT 5931 Research Topics in Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

MGMT 5939 Independent Studies in Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Independent directed study in Management.  
*Prerequisites:* Approval of instructor, Faculty Chair and Associate Dean required.

MGMT 6131 Foundations in Sustainability  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers the fundamentals of sustainability, including sustainability definitions and models, triple bottom line considerations in business, and sustainability concerns in natural resource management and community planning. Students taking this course will obtain a overview of how and where organizational and environmental management professionals interact with the field of sustainability.

MGMT 6135 Data Visualization and Communication  
Credit: 3 | Lecture: 3 | Lab: 0  
This course emphasizes communicating with data, primarily through the use of data visualizations. Data visualization is a medium through which data analytics can be used to support strategic and executive decision-making. Topics of the course include principles of visualization design, choices of visualizations, creating business dashboards, and communicating visualizations through various media. Students will design visualizations suitable for publication in professional reports, online media, and formal presentations. Various types of visualizations will be covered including bar/column charts (with clustered variations); line, box, and stem charts; scatter plots; slopegraphs; bubble charts; and heat maps.

MGMT 6237 Comparative Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
The course will examine and focus on proven executive leadership best practices across a range of complex organizations.
MGMT 6331 Organizational Development
Credit: 3 | Lecture: 3 | Lab: 0
Measures for guiding change in the industrial setting; impacts on the labor force and the production process. Change models, diagnostic techniques, intervention strategies and the ethics of change agent client system relationship.
Prerequisites: MGMT 5032 or equivalent.

MGMT 6332 International Management
Credit: 3 | Lecture: 3 | Lab: 0
The course focuses on the challenges of international management including topics of global strategy, organizational design, cross-cultural communication, and human resources.
Prerequisites: MGMT 5032 and BAPA 5131, or equivalents.

MGMT 6333 Seminar in International Management
Credit: 3 | Lecture: 3 | Lab: 0
Meetings in the field are conducted with the officers of companies operating in other countries. Sessions will be concerned with cultural and legal considerations that make labor relations, resource coordination and other management considerations different from the American experience.

MGMT 6334 Global Sustainability and Strategic Advantage
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a basic understanding of the strategic implications and applications related to business and institutional sustainability. This course provides a basic understanding of the strategic implications and applications related to business and institutional sustainability. Using a strategy lens, this course seeks to provide students with an understanding of the key concepts related to the business case of sustainability, tackling topics key to sustainable strategies and social responsibility through a mix of assignments and case analyses.
Prerequisites: ENVR 5132
Prerequisites: ENVR 5131 Foundations in Sustainability

MGMT 6731 Strategic Management Seminar (Capstone)
Credit: 3 | Lecture: 3 | Lab: 0
Introduction to corporate-level and business-level strategy. Study of the strategic management process and factors necessary for competitive success in industries.
Prerequisites: Other degree requirements and LAST SEMESTER.

MGMT 6739 Internship in Management
Credit: 3 | Lecture: 3 | Lab: 0
Supervised internship with an approved firm or with an industrial or governmental agency; written and oral reports required.
Prerequisites: Master's degree candidacy and approval of adviser and dean.
MKTG Marketing

MKTG 3301 Principles of Marketing
Credit: 3 | Lecture: 3
Focus is on initiating, building and maintaining mutually beneficial relationships with customers through the strategic use of the marketing mix. Topics include marketing research, market segmentation and targeting, buyer behavior, product development, brand management, promotion, international marketing, e-marketing, and ethical marketing practices.

MKTG 5332 Executive Decisions in Marketing
Credit: 3 | Lecture: 3 | Lab: 0
Making information-based strategic and tactical marketing decisions related to target market selection, product, price, distribution and promotion that increase the probability of success in a competitive marketplace. *Prerequisites: BAPA 5031 and MGMT 5032, or equivalents.*

MKTG 5334 Strategic Brand Management
Credit: 3 | Lecture: 3 | Lab: 0
Building and effectively maintaining brand equity is among the top priorities of high performing companies. Effective brand-building and strategic brand management drives customer loyalty and superior long term performance. Strategic Brand Management is a graduate course that explores why brands are important, what they represent to consumers, and what firms should do to manage them effectively. *Prerequisites: BAPA 5031 or equivalents.*

MKTG 5532 International Marketing Strategy
Credit: 3 | Lecture: 3 | Lab: 0
 Begins with a discussion of incentives for and barriers to international trade, and foreign market selection and entry strategies. Then examines product, price, distribution, and promotion decisions in an international context. Involves secondary marketing research and developing a marketing plan for product introduction into a foreign market. *Prerequisites: BAPA 5031 or equivalent.*

MKTG 5533 Seminar in International Marketing
Credit: 3 | Lecture: 3 | Lab: 0
Meetings with the chief marketing people at major firms in several countries are conducted. Sessions will concentrate on their approaches to market development and analysis. Emphasis will be placed on problems and on solutions to those problems that are peculiar to other cultures. *Prerequisites: BAPA 5031 or equivalent.*

MKTG 5534 Advanced Professional Services Marketing
Credit: 3 | Lecture: 3 | Lab: 0
Central issues involved in planning, implementing and controlling professional services marketing strategies. Examines positioning and use of information technology as a means of achieving differential. *Prerequisites: BAPA 5031 or equivalent.*

MKTG 5931 Research Topics in Marketing
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered.
MKTG 5939 Independent Studies in Marketing  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Independent directed study in Marketing.  
**Prerequisites:** Approval of instructor, Faculty Chair and Associate Dean required.

MKTG 6739 Internship in Marketing  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Supervised work experience in an approved business, non-profit or governmental agency. Written work is required by sponsoring faculty member.  
**Prerequisites:** Master's degree candidacy and approval of sponsoring faculty member, Faculty Chair and Associate Dean.

OSHE Occupational Safety and Health

OSHE 4316 System Safety and Accident Investigation  
**Credit: 3 | Lecture: 3**  
The course handles applications of system safety techniques in the industrial work environment and accident investigation theory and practice. Review of loss control management concepts, risk management, S & H training acceptance of risk, identification and initiation of corrective actions, pre-accident planning, emergency response, collection of evidence, analysis of information, investigation, organization, management and report writing.  
**Prerequisites:** CHEM 2323

OSHE 4333 Construction and General Industry Safety  
**Credit: 3 | Lecture: 3**  
This covers safety and health principles in the construction and general industries as well as OSHA policies, procedures and standards. Special emphasis is placed on those areas that are most hazardous in construction and general industry.  
**Prerequisites:** PHYS 1302

OSHE 4334 Chemical Processing and Petroleum Refining  
**Credit: 3 | Lecture: 3**  
This course covers the fundamentals of chemical processing, including basic process chemistry, equipment, diagrams, process flows, feedstock, and chemical products necessary to manufacture chemical products on an industrial scale.  
**Prerequisites:** CHEM 2323

OSHE 4335 Process Safety and Chemical Risk Management  
**Credit: 3 | Lecture: 3**  
This course covers the fundamentals of process safety management, risk-based process safety, and risk management plans to safeguard industrial chemical facilities that process flammable, combustible, reactive or toxic materials. The aim is on the prevention of toxic releases, fires and explosions that could cause loss of life, property damage and environmental harm. Includes historical incidents and their contributing causes and outcomes, as well as safety management systems and process safety regulations.  
**Prerequisites:** CHEM 2323

OSHE 4411 Noise and Hearing Conservation  
**Credit: 4 | Lecture: 3 | Lab: 1**  
Anatomy and physiology of the human ear; sound propagation and the mechanism of hearing loss; federal and state noise regulations; noise measurement and analysis; establishing a hearing conservation and noise control program in industry.  
**Prerequisites:** PHYS 1302
OSHE 4413 Industrial Ventilation  
Credit: 4 | Lecture: 3 | Lab: 1  
General principles of ventilation, dilution ventilation, comfort ventilation; heat–cold stress control, hood design, air contaminant control; testing ventilation systems and industrial ventilation guidelines.  
*Prerequisites: MATH 1314*

OSHE 5131 Control of Occupational and Environmental Hazards  
Credit: 3 | Lecture: 3  
Engineering and control technology used to eliminate and reduce hazards. Includes ventilation design, shielding, heat and cold stress, noise control, emissions control and waste management.  
*Prerequisites: CHEM 2323, PHYS 1302*

OSHE 5135 Statistical Analysis  
Credit: 3 | Lecture: 3  
Fundamental statistical concepts related to the applied industrial and environmental sciences: descriptive statistics; sampling; statistical distributions; confidence intervals, hypothesis testing; chi-square tests; correlation, simple and multiple linear regression; one-way ANOVA. Use of statistical software packages to analyze and present data.  
*Prerequisites: MATH 1314*

OSHE 5233 Recognition of Occupational Diseases  
Credit: 3 | Lecture: 3  
Incidence and patterns of occupational diseases in the U.S. Approaches to recognition and prevention. Workplace exposures and effects. Occupational disorders by organ systems.

OSHE 5234 Hazardous Materials Management  
Credit: 3 | Lecture: 3  
This course covers hazardous materials management as it pertains to the properties of hazardous materials, sampling and analysis, fate and transport in the environment, impacts on health and the environment, risk assessment, laws and regulations, generation, storage, transportation, disposal and treatment. Emergency response and reporting are included.  
*Prerequisites: CHEM 2323*

OSHE 5235 Fire Safety Engineering  
Credit: 3 | Lecture: 3  
This course studies fire science, causes, prevention, and inspection. This includes fire dynamics and behavior, prevention activities, extinguish, detection, hazards, fire causes, types of construction including structural features, flame spread, occupancy and fire load, as well as petrochemical fire safety and combustible dust.  
*Prerequisites: CHEM 1311, PHYS 1301*

OSHE 5236 Advanced Process Hazard Analysis and Consequence Assessment  
Credit: 3 | Lecture: 3  
This course applies engineering principles to process hazard assessment, dust hazard analysis and consequence assessment. Includes various assessment techniques and use of software packages to assess the consequences of toxic releases, fires and explosions on life, property and the environment.  
*Prerequisites: CHEM 2323*
OSHE 5333 Air Pollution  
Credit: 3 | Lecture: 3  
Background, sources and fate of atmospheric pollutants. Air pollution episodes, meteorology, dispersion modeling, air quality measurements, controls, criteria, guidelines and health standards.  
Prerequisites: CHEM 2323, PHYS 1302

OSHE 5334 Human Factors Engineering  
Credit: 3 | Lecture: 3  
Provides an analysis of the principles of human factors and ergonomics. The course covers human information processing, man-machine systems, information design, display and control design, static and dynamic anthropometrics and fundamentals of biomechanics, musculoskeletal injuries, including Cumulative Trauma Disorders such as Carpal Tunnel Syndrome, hand tool design, back injuries, vibrations, shift work, biological rhythms and workload assessment. Emphasis is placed on ergonomic methods and techniques to assess the design of modern work environments.

OSHE 5335 Ergonomic Methods and Analysis Techniques  
Credit: 3 | Lecture: 3  
Provides students with a variety of methods to analyze tasks and make accommodations and redesigns based on the principles of human factors and ergonomics. Emphasis is placed on Human Factors/Ergonomic methods and techniques to assess the design of modern work environments to accommodate people with disabilities or provide suitable redesigns to enhance human performance.

OSHE 5336 Safety, Health and Environmental Issues  
Credit: 3 | Lecture: 3  
Principles and concepts of environmental health and safety including essential information related to the recognition, evaluation and control of occupational and environmental hazards; Includes information related to public safety, the community, businesses, labs, government, and education/research or other work environments.

OSHE 5431 Practicum in Industrial Hygiene and Safety  
Credit: 3 | Lecture: 3  
Requires approval of faculty adviser. The selection, study and formal presentation of topics in Industrial Hygiene and Safety based on advanced field, laboratory, library research study, supervised work experience in an approved industrial firm or government agency or educational work assignments. Written and oral reports required.  
Prerequisites: 12 hours of credit.

OSHE 5530 Research Methods: Occupational Safety and Health  
Credit: 3 | Lecture: 3  
Development of proposal for master's project or thesis research.  
Prerequisites: STAT 5135, adviser approval and approved research topic.

OSHE 5739 Internship in Occupational Safety and Health  
Credit: 3 | Lab: 1  
Supervised work experience in an approved industrial firm or governmental agency. Written and oral report required.  
Prerequisites: Master's degree candidacy as well as approval by adviser and dean.
OSHE 5915 Cooperative Education Work Term  
Credit: 1 | Lab: 1  
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)  
**Prerequisites:** Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

OSHE 5919 Independent Study in Occupational Safety and Health  
Credit: 1 | Lab: 1  
**Prerequisites:** Approval of instructor, chair and associate dean.

OSHE 5931 Research Topics in Occupational Safety and Health  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

OSHE 5939 Independent Study in Occupational Safety and Health  
Credit: 3 | Lecture: 3  
**Prerequisites:** Approval of instructor, chair and associate dean.

OSHE 6135 Radiation Protection  
Credit: 3 | Lecture: 3  
Advanced principles of ionizing and non-ionizing radiation are presented to provide the students who already have a basic understanding of radiation protection with an enhanced competence to solve theoretical and practical problems in radiation protection.  
**Prerequisites:** PHYS 1302

OSHE 6242 Analytical Methods for Evaluation of Health Hazards  
Credit: 4 | Lecture: 3 | Lab: 1  
Survey procedures and instrumental methods of analysis for atmospheric and occupational hazards. Optical microscopy, noise, radiation, colorimetry, gas chromatography, atomic absorption, infrared and mass spectrometry.  
**Prerequisites:** CHEM 2323, STAT 5135

OSHE 6332 Safety Engineering  
Credit: 3 | Lecture: 3  
Application of engineering principles to produce design, plant layout, construction, maintenance, pressure vessels, power tools, electric equipment, confined spaces and transportation systems. Includes consensus standards and governmental regulations.  
**Prerequisites:** OSHE 3340 or equivalent.

OSHE 6731 Graduate Seminar  
Credit: 3 | Lecture: 3  
Advanced seminar where an in-depth perusal of an environmental science topic shall be undertaken and a formal paper and presentation shall be completed.  
**Prerequisites:** OSHE 5530, STAT 5135 and 24 hours complete in an approved graduate program.

OSHE 6838 Research Project  
Credit: 3 | Lecture: 3  
Students complete their research project; write the research paper and present research findings in a public forum.  
**Prerequisites:** OSHE 5530, 24 hours completed within a CPS and approval of graduate adviser.

OSHE 6939 Master's Thesis Research  
Credit: 3 | Lecture: 0 | Lab: 1  
**Prerequisites:** Approval of faculty adviser, master's committee and dean.
PHIL Philosophy

PHIL 5431 Metaphysics
Credit: 3 | Lecture: 3 | Lab: 0
Inquiry into the thought of major thinkers on the nature of reality. The particular philosophers to be studied will vary from semester to semester.

PHIL 5433 Continental Philosophy
Credit: 3 | Lecture: 3 | Lab: 0
The study of major European philosophers of the modern period: Kant, Hegel, Nietzsche, Heidegger, Levinas, and others.

PHIL 5931 Research Topics in Philosophy
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

PHIL 5939 Independent Study in Philosophy
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

PHYS Physics

PHYS 1101 Laboratory for College Physics I
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory to reinforce topics in College Physics I. Experiments on motion, Newton's laws, wave mechanics, heat and thermodynamics.

PHYS 1102 Laboratory for College Physics II
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory to reinforce topics in College Physics II. Experiments conducted on electric fields, DC and AC circuits, magnetism, electromagnetic induction, light and optics.

PHYS 1301 College Physics I
Credit: 3 | Lecture: 3
Algebra based introductory physics course. Fundamentals of mechanics, kinematics, Newton's laws, conservation of energy, momentum, rigid body motion, waves, sound, fluids, heat and thermodynamics.
Prerequisites: MATH 1314 and Trigonometry or MATH 2412,

PHYS 1302 College Physics II
Credit: 3 | Lecture: 3
Algebra based introductory physics course. Electric forces and fields, current, DC and AC circuits, magnetism, electromagnetic induction, electromagnetic waves, light and optics.
Prerequisites: PHYS 1101, PHYS 1301

PHYS 2326 University Physics II
Credit: 3 | Lecture: 3
Calculus based introductory physics course. Electric forces and fields, Gauss' laws, DC and AC circuits, magnetic forces and fields, electromagnetic induction, Maxwell's equations, electromagnetic waves, geometric optics and introduction to modern physics.
Prerequisites: MATH 2414, PHYS 2325
Corequisites: PHYS 2126

PHYS 3311 Mathematical Methods for Physics and Engineering I
Credit: 3 | Lecture: 3
Overview of the essential mathematics needed for advanced Physics courses including: Vector Analysis in flat and curved coordinates, Matrices, Group Theory, Infinite Series, Complex Variables and Differential Equations.
Prerequisites: MATH 2315
PHYS 3312 Mathematical Methods for Physics and Engineering II  
**Credit: 3 | Lecture: 3**  
A continuation of Mathematical Methods for Physicists I including such topics as Special Functions, Legendre Polynomials, Bessel Functions, Fourier Series, Integral Transforms, Partial Differential Equations, Probability and Calculus of Variations.  
*Prerequisites: PHYS 3311 or equivalent.*

PHYS 5011 Experiments in Modern Physics  
**Credit: 1 | Lecture: 0 | Lab: 3**  
Topics include: Experiments including relativity, light, nuclear physics and quantum mechanics. Experimental research project.

PHYS 5311 Recitation for Electrodynamics  
**Credit: 1 | Lecture: 1**  
One hour recitation section to review examples and problems in PHYS 5331.  
*Prerequisites: Prerequisite or corequisite: PHYS 5331.*

PHYS 5331 Electrodynamics  
**Credit: 3 | Lecture: 3**  
Dynamics of electric and magnetic fields, Maxwell's equations, electromagnetic radiation, special relativity, wave guides, boundary value problems, multipoles, scattering, radiation from moving charges, radiating systems, relativistic particles in electromagnetic fields, collisions of charged particles, radiation damping and radiative beta process.

PHYS 5411 Recitation for Classical Mechanics  
**Credit: 1 | Lecture: 1**  
One hour recitation section to review examples and problems in PHYS 5431. Advanced topics in electrodynamics not normally covered in PHYS 5331 such as radiating systems, diffraction, relativistic particles in electromagnetic fields, collisions of charged particles, radiation damping and radiative beta processes.  
*Prerequisites: Prerequisite or corequisite: PHYS 5431.*

PHYS 5431 Classical Mechanics  
**Credit: 3 | Lecture: 3**  
Introduces concepts such as the Langrangian dynamics of particles, Hamiltonian mechanics and canonical transformations in order to calculate the classical motion of particles.

PHYS 5511 Recitation for Mathematical Methods in Physics I  
**Credit: 1 | Lecture: 1**  
One hour recitation section to review examples and problems in PHYS 5531.  
*Prerequisites: Prerequisite or corequisite: PHYS 5531.*

PHYS 5531 Mathematical Methods I  
**Credit: 3 | Lecture: 3**  
A review of essential mathematics required to solve graduate level physics problems: differential equations, complex mathematics, linear algebra, infinite series and more.
PHYS 5532 Mathematical Methods II  
Credit: 3 | Lecture: 3  
This course is a continuation of Mathematical Methods I. Course content may include: advanced boundary conditions, perturbation theory, group theory, tensor analysis, using mathematical software packages (such as Mathematica, Matlab or Maple) or other advanced mathematical applications to physics and engineering.  
*Prerequisites: PHYS 5531 or instructor approval.*

PHYS 5533 Methods in Computational Physics  
Credit: 3 | Lecture: 3  
An introduction to the numerical methods used to solve various physics problems; evolving differential equations, performing Monte-Carlo simulations, simulate fluid flow and more.  
*Prerequisites: PHYS 5531 or instructor approval and a working knowledge of a programming language.*

PHYS 5632 Quantum Mechanics II  
Credit: 3 | Lecture: 3  
*Prerequisites: PHYS 5631 or equivalent.*

PHYS 5711 Recitation for Statistical Mechanics  
Credit: 1 | Lecture: 1  
One hour recitation section to review examples and problems in PHYS 5731.  
*Prerequisites: Prerequisite or corequisite: PHYS 5731.*

PHYS 5731 Statistical Mechanics  
Credit: 3 | Lecture: 3  
Principles of statistical mechanics and their applications to various physical systems, fundamental principles of thermodynamics and statistical mechanics, including probability theory, kinetic theory, entropy, classical statistical mechanics, ensembles, quantum statistical mechanics, ideal Bose and Fermi systems and phase transitions.

PHYS 5739 Internship in Physics  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
*Prerequisites: Master's degree candidacy as well as approval by adviser and dean.*

PHYS 5911 Research Topics in Physics  
Credit: 1 | Lecture: 1  
Identified by specific title each time course is offered.
PHYS 5915 Cooperative Education Work Term
Credit: 1 | Lecture: 1
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

PHYS 5919 Independent Study in Physics
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

PHYS 5931 Research Topics in Physics
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

PHYS 5939 Independent Study in Physics
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean.

PHYS 6132 General Relativity
Credit: 3 | Lecture: 3
Topics include: Manifolds, Spacetime Curvature, Riemann Geometry, Geodesics, Killing Vectors, Einstein's Equation, The Schwarzschild solution and other Black Hole solutions to Einstein's Equations.
Prerequisites: PHYS 5331 or equivalent.

PHYS 6231 Plasma Physics
Credit: 3 | Lecture: 3
Computer programming experience and PHYS 5533 are desired but not required. The course provides a basic understanding of plasma physics fundamentals and a review of the state-of-the-art of current research of plasma science and engineering (nuclear fusion, industrial plasmas, advanced space propulsion and space plasmas.
Prerequisites: Core Physics courses or instructor approval.

PHYS 6331 Astroparticle Physics
Credit: 3 | Lecture: 3
Topics include: Symmetries and conservation rules, introduction to representation of groups, gauge theories, neutrino astrophysics, particle cosmology and astrophysics.
Prerequisites: PHYS 5632 or equivalent.

PHYS 6837 Advanced Physics Research
Credit: 3 | Lecture: 3
Supervised research in physics for graduate students. May be used to complete a thesis proposal.

PHYS 6838 Research Project and Seminar
Credit: 3 | Lecture: 3
Students will develop a research project that integrates knowledge and standard procedures in the discipline. A written paper and oral presentation will be required.
Prerequisites: 24 hours completed in approved graduate program.

PHYS 6939 Master's Thesis Research
Credit: 3 | Lecture: 3
Prerequisites: Approval of faculty adviser, master's committee and dean.
PSYC Psychology

PSYC 2301 Introduction to Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the major psychological topics, theories, and approaches to the scientific study of behavior and mental processes.

PSYC 3315 Psychological Thinking
Credit: 3 | Lecture: 3 | Lab: 0
Focuses on gaining skills necessary to understand and critique issues and research from a psychological perspective. Emphasis will be on critical thinking and expression of ideas, APA style, and journal reading. Psychology majors must take this course in the first semester of their junior year.
Prerequisites: PSYC 2301 Pre- or Co-requisite: PSYC 3311

PSYC 3321 Learning
Credit: 3 | Lecture: 3 | Lab: 1
Basic principles of learning and how they apply to human behavior.

PSYC 3331 Theories of Personality
Credit: 3 | Lecture: 3 | Lab: 0
Theories of the origins, structure, and dynamics of personality; emphasis on the "normal" personality.

PSYC 4311 Social Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Attitudes, social cognition, personal perception, self, social influence, relationships, prejudice, helping, and aggression. Theories, research, and application. (Cross-listed with SOCI 4311.)

PSYC 4314 Child Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Cognitive, social, and emotional development of children; psychoanalytic, behavioristic, and Piagetian approaches.

PSYC 4316 Brain and Behavior
Credit: 3 | Lecture: 3 | Lab: 0
The biological basis of how one thinks, feels, and acts.

PSYC 4351 Abnormal Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Neurotic and psychotic personality patterns; etiology, symptoms, diagnosis, and correctional methods and institutions viewed from a psychological perspective.

PSYC 4382 Cognitive Psychology
Credit: 3 | Lecture: 3 | Lab: 0
An empirical and theoretical examination of human cognitive processes. Possible topics include perception, memory, problem solving, and artificial intelligence.

PSYC 5030 Experimental Analysis of Behavior: Special Topics
Credit: 3 | Lecture: 3 | Lab: 0
This course serves as an introduction the Experimental Analysis of Behavior. Topics include stimulus equivalence, conditional discriminations, rule-governance, behavioral pharmacology, and verbal behavior.
Prerequisites: PSYC 5235, PSYC 5435, and PSYC 6238.

PSYC 5031 Human Growth and Development
Credit: 3 | Lecture: 3 | Lab: 0
An overview of the developmental process throughout the life span. Focus on physical, cognitive, social, and emotional components of development.
PSYC 5038 Foundations of Development: Infancy and Childhood  
Credit: 3 | Lecture: 3 | Lab: 0  
The study of theories and research methodologies as applied to infants and children. The focus of the course will be how these theories and methodologies aid in understanding infants' and children's physical, cognitive, and socio-emotional development.

PSYC 5039 Foundations of Developmental Psychology: Adolescent  
Credit: 3 | Lecture: 3 | Lab: 0  
Graduate-level introduction to the study of normative psychological development during adolescence. The class will cover contemporary and classic research on biological, cognitive, emotional, and social development during the second decade of life, and on the contextual factors, both interpersonal and institutional, that influence adolescent development.

PSYC 5111 Orientation to School Psychology  
Credit: 1 | Lecture: 1 | Lab: 0  
Orientation of students to the field of School Psychology. Addresses the history and development, paradigms for service delivery, and roles and functions of school psychology specialists. Students will accompany practicing LSSP to be directly exposed to roles and functions performed.  
Prerequisites: Admission to School Psychology program.

PSYC 5131 Psychopathology of Childhood  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of psychological disorders of childhood and adolescence: diagnostic categories, assessment approaches, etiology, treatment, and prognosis.  
Prerequisites: PSYC 5031 or equivalent.

PSYC 5134 Interviewing  
Credit: 3 | Lecture: 3 | Lab: 0  
Interviewing skills, goal setting, evaluating client progress, cultural sensitivity, and ethics. Critical analysis of research literature.

PSYC 5135 Ethics in Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
Ethics, dual relationships, legal issues, confidentiality, and other professional issues in the delivery of human services.

PSYC 5136 Multicultural Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of culturally sensitive clinical practice with ethnic and other minority clients.  
Prerequisites: Admission to the Clinical Psychology, Family Therapy, or School Psychology program.

PSYC 5138 Mindfulness and Acceptance Therapies  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the theory and research supporting recent trends in behavior therapy, particularly the group of therapies interested in the constructs of mindfulness and acceptance.  
Prerequisites: Admission to the Clinical Psychology, Family Therapy, or School Psychology program.
PSYC 5231 Psychotherapy: Theory and Research
Credit: 3 | Lecture: 3 | Lab: 0
Forms of modern psychotherapy: psychoanalysis, humanistic, existential, and behavioral.
Prerequisites: PSYC 3331, PSYC 4351, or equivalent. Admission to the Clinical Psychology, Family Therapy, or School Psychology program.

PSYC 5233 Introduction to Family Therapy
Credit: 3 | Lecture: 3 | Lab: 0
Introduction to theories and techniques of family and marital therapy, family process, and lifestyle of the family.

PSYC 5234 Individual and Family Development Across the Lifespan
Credit: 3 | Lecture: 3 | Lab: 0
Overview of individual and family process and modifications to family structures over the course of the family cycle (e.g., birth of child, adolescence and mid-life, launching and empty nest, etc.).
Prerequisites: PSYC 5233 and admission to the Family Therapy program.

PSYC 5235 Learning Principles
Credit: 3 | Lecture: 3 | Lab: 1
Basic principles of learning and their applications to human problems. Preparation for more advanced applications courses. An undergraduate learning or behavioral modification course is recommended as a preparation.

PSYC 5236 Family Assessment
Credit: 3 | Lecture: 3 | Lab: 0
An overview of assessment methods and instruments related to marital and family dysfunctions. Diagnosis of dysfunctional relationship patterns and of nervous and mental disorders.
Prerequisites: Admission to the Family Therapy program.

PSYC 5239 Group Psychotherapy
Credit: 3 | Lecture: 3 | Lab: 0
An introduction to the theory and practice of group psychotherapy, including the study of group dynamics and group process. Students participate as group members and practice, under supervision, as group facilitators.
Prerequisites: Pre- or Co-requisites: Completion of or concurrent enrollment in PSYC 5731.

PSYC 5331 Personnel Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Overview of the issues and problems encountered by industrial/organizational psychologists. Topics include job analysis, employee selection, performance appraisal, reliability and validity, and employment law.
Prerequisites: Pre- or Co-requisite: PSYC 6333. PSYC 6036 may also be used with instructor consent.

PSYC 5332 Organizational Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Overview of the issues and problems which organizational psychologists examine and the methods they employ. Topics include work motivation, job attitudes, and organizational change.
PSYC 5333 Leadership in Organizations  
Credit: 3 | Lecture: 3 | Lab: 0  
Interdisciplinary examination of the determinants and consequences of effective and ineffective leadership in various types of organizations. (Cross-listed with SOCI 5339.)

PSYC 5334 Change and Organizational Development  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduces students to notion of change at both individual and organizational levels. Survey of organizational change techniques and strategies. Students learn to work in groups and apply OD models to diagnose organizational problems and recommend interventions. (Cross-listed with SOCI 5430.)

PSYC 5335 Career Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
Review of theories of career choice, accessing vocational information, theories, and methods of career assessment and counseling techniques to facilitate career development across the lifespan.

PSYC 5339 Training and Development  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of training and development in organizations with particular emphasis on needs assessment, the learning environment, and methods of program evaluation.

PSYC 5432 Psychoactive Drugs  
Credit: 3 | Lecture: 3 | Lab: 0  
Legal and illegal drugs and their effects on mental state and behavior; how they work on the nervous system; why people use them; attempts to control them.

PSYC 5433 Substance Abuse: Causes and Treatments  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of the factors that contribute to substance abuse and the various treatment modalities.

PSYC 5435 Conceptual Issues in Behavior Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
Coverage of major theories that have contributed to contemporary behavior analysis. Topics include radical behaviorism, philosophy of science, and a functional analysis of language (verbal behavior).  
Prerequisites: PSYC 5235.

PSYC 5437 Aging  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of current and future issues relating to the elderly from both a psychological and a societal perspective. (Cross-listed with SOCI 5437.)

PSYC 5438 Development of Gender and Racial Identity  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of theoretical approaches to the study of gender and racial/ethnic identity development.

PSYC 5532 Advanced Social Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
Theory, methodology, and research findings pertinent to the individual in social context. (Cross-listed with SOCI 5532.)
PSYC 5533 Psychology of Gender, Race, and Sexuality
Credit: 3 | Lecture: 3 | Lab: 0
Sex roles, stereotyping, socialization of women and men, feminism, female sexuality, feminist therapy, androgyny, situation of minority women. Women's and Gender Studies course.

PSYC 5535 Cross–Cultural Perspectives on the Family
Credit: 3 | Lecture: 3 | Lab: 0
Cross-cultural data are used to examine family systems including marriage, sex roles, and child rearing.

PSYC 5536 Occupational Health Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Effects of work environment on employees' health and well-being. Emphasis on promotion of wellness and prevention of negative health-related consequences within organizational settings.

PSYC 5537 Professional Issues in Industrial/Organizational Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Survey of issues related to professional ethics, relevant legislation, professional affiliations, professional identity, and professional responsibilities. Topics vary; may be repeated for credit.

PSYC 5538 Job Attitudes
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on employee attitudes in the workplace. We will examine common attitude theories, attitude change, and the proper measurement of such attitudes.
Prerequisites: Pre or Co-requisite: PSYC 6037 or PSYC 6334

PSYC 5539 Cross-cultural Issues in I/O Psychology
Credit: 3 | Lecture: 3 | Lab: 0
The course views industrial-organizational psychology through a cross-cultural lens discussing business practices and outcomes around the world and the impact that culture has on organizations.

PSYC 5630 Behavioral Family Systems
Credit: 3 | Lecture: 3 | Lab: 0
This course provides training in assessment, treatment, consultation, and coordination of care within an evidence-based approach for disruptive behaviors, behavioral parent training (BPT). This course also covers the theoretical underpinnings for the field of BPT and empirical data supporting its validity. Practical and ethical issues for working with children/families in clinical settings is discussed.
Prerequisites: Admission to the Clinical Psychology, School Psychology, or Family Therapy program

PSYC 5731 Psychotherapy Skills and Professional Orientation
Credit: 3 | Lecture: 3 | Lab: 0
Counseling skills development and micro-skills laboratory experience. The course also familiarizes students with codes of ethics, legal aspects of professional practice, and facilitates the development of role identity for individuals providing counseling and psychosocial interventions.
Prerequisites: Undergraduate Abnormal Psychology. Courses in abnormal psychology and personality or permission of instructor. Admission to the Clinical Psychology, School Psychology, or Family Therapy program.
PSYC 5734 Ethics, Law, and Professional Consultation
Credit: 3 | Lecture: 3 | Lab: 0
Issues in professional practice: career planning, licensing, Texas law, ethics, and professional consultation, standards, and responsibilities. 
Prerequisites: Admission to the Clinical Psychology, School Psychology, or Family Therapy program.

PSYC 5735 Anxiety and Stress Management
Credit: 3 | Lecture: 3 | Lab: 0
Examination of development and maintenance of stress and anxiety. Focus on anxiety disorders, stress conditions, and methods of treatment including cognitive-behavioral therapy, progressive muscle relaxation, exercise, meditation, stress inoculation, and pharmacological approaches.

PSYC 5736 Behavioral Medicine
Credit: 3 | Lecture: 3 | Lab: 0
Clinical applications of behavioral principles in the prevention and treatment of physical disease. 
Prerequisites: Pre- or Co-requisite: A course in behavior analysis or in learning principles.

PSYC 5737 Family Therapy Professional Ethics
Credit: 3 | Lecture: 3 | Lab: 0
Issues in the professional practice of family therapy: legal and professional standards and responsibilities, ethics, licensing, and Texas law. 
Prerequisites: Admission to the Family Therapy program.

PSYC 5738 Family Therapy Practicum
Credit: 3 | Lecture: 3 | Lab: 1
Supervised clinical experience working with families including study of advanced family systems interventions and a focus on students' own families. 
Prerequisites: PSYC 5233, PSYC 5731, PSYC 5737, and PSYC 6531. Admission to the Family Therapy program.

PSYC 5835 Acceptance and Commitment Therapy for Addictions
Credit: 3 | Lecture: 3 | Lab: 0
Examination of factors contributing to substance abuse as well as conceptual and applied learning about treatment modalities, with emphasis on mindfulness and acceptance-based psychotherapies.

PSYC 5919 Independent Study in Psychology
Credit: 1 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 1, 2, or 3 credit hours.

PSYC 5929 Independent Study in Psychology
Credit: 2 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 1, 2, or 3 credit hours.

PSYC 5931 Research Topics in Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.
PSYC 5932 Research Topics in Applied Cognitive Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Special topics class focused on current research topics in the field of applied psychology especially those topics which have crossover into other psychological fields and non-psychology disciplines.

PSYC 5939 Independent Study in Psychology
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 1, 2, or 3 credit hours.

PSYC 6030 Sensation and Perception
Credit: 3 | Lecture: 3 | Lab: 0
Exposes students to the complexities and mechanisms of human sensation/perception. Class will focus on details of human sensation/perception and the application of such knowledge.

PSYC 6031 Behavioral Assessment
Credit: 3 | Lecture: 3 | Lab: 0
Study of various behavioral assessment instruments, single subject research designs, and ethics as applied to behavioral analysis. 
Prerequisites: PSYC 5235 and PSYC 6238 or equivalent. Admission to the M.A. program, Graduate Certificate in Behavior Analysis, or School Psychology Program.

PSYC 6032 Intellectual Assessment
Credit: 3 | Lecture: 3 | Lab: 1
Review of theory underlying intelligence tests with emphasis on the CHC approach. Supervised practice in the administration, scoring, and interpretation of intellectual tests, specifically the Wechsler Scales and Woodcock–Johnson.
Prerequisites: Pre- or Co-requisite: PSYC 6036 and PSYC 6037. Admission to the Clinical Psychology or School Psychology program.

PSYC 6033 Personality Assessment
Credit: 3 | Lecture: 3 | Lab: 0
An overview of the major psychological assessment techniques. Emphasis on structured interviews, personality inventories, and projective techniques.
Prerequisites: PSYC 6531 or PSYC 5131. Admission to the Clinical Psychology or School Psychology program.

PSYC 6034 Consultation in School Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: 31 hours of School Psychology coursework. Admission to School Psychology program.

PSYC 6035 Qualitative Research Methods
Credit: 3 | Lecture: 3 | Lab: 0
Qualitative research involves data collection and rigorous analysis of observations, interviews, focus groups, archives and primary sources, and other records to better understand human behavior.
PSYC 6036 Advanced Nonexperimental Methods and Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
Advanced and design research methodologies and statistical analysis for the behavioral sciences with emphasis on nonexperimental and correlational research.  
**Prerequisites:** Undergraduate course in statistics.

PSYC 6037 Advanced Experimental Methods and Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
Advanced application and design of research methodologies and statistical analysis for the behavioral sciences with emphasis on experimental research.  
**Prerequisites:** Undergraduate course in statistics.

PSYC 6038 Clinical Practicum  
Credit: 3 | Lecture: 0 | Lab: 0  
Application of therapy skills with clients under supervision. Written report required.  
**Prerequisites:** PSYC 5731 and PSYC 6531. Admission to the Clinical Psychology program; permission of the instructor and twelve hours of graduate-level coursework including Basic Psychotherapy Skills, Psychopathology, and two therapy or testing courses.

PSYC 6039 School Psychology Practicum  
Credit: 3 | Lecture: 0 | Lab: 0  
Application of assessment skills with clients under supervision. Written reports required. Field experience required.  
**Prerequisites:** PSYC 6032 and PSYC 6133. Admission to the School Psychology program.

PSYC 6111 Student Diversity in Learning  
Credit: 1 | Lecture: 1 | Lab: 0  
Study of potential effects of racial, cultural, ethnic, experiential, socioeconomic, gender-related, and linguistic variables that affect development and learning. Development of cultural competency and necessary skills for providing services to diverse populations of children and families in an educational setting.  
**Prerequisites:** Admission to the Clinical Psychology, School Psychology, or Health Service Psychology program.

PSYC 6121 Ethics and Law in School Psychology  
Credit: 2 | Lecture: 2 | Lab: 0  
Exploration of ethical and legal guidelines pertinent to delivery of psychological services in a school setting. Planning and establishing a professional identity for career development; understanding legalities, ethics, and standards of practice for school psychology; and working effectively with special populations and problems in school settings.  
**Prerequisites:** Admission to the Clinical Psychology, School Psychology, or Health Service Psychology program.

PSYC 6130 Psychological Measurement  
Credit: 3 | Lecture: 3 | Lab: 0  
This is an introductory core clinical course that focuses on methods and objective measures used in the assessment of child, adolescent and adult patients across a wide range referral questions. It is designed to cover major domains of assessment across the life span. It is also designed to provide information and training in the skills needed for conducting psychological assessments.
PSYC 6132 Seminar in Professional School Psychology
Credit: 3 | Lecture: 3 | Lab: 0
History and foundation of school psychology, roles, and functions of the school psychologist, special education laws, and professional issues related to the practice of school psychology. *Prerequisites: 51 hours of School Psychology coursework.*

PSYC 6133 Personality Assessment of the Child
Credit: 3 | Lecture: 3 | Lab: 0
Supervised Review and practice in the use of major personality tests for to assess children and adolescents, including projective and objective/empirical measures. Report writing required. *Prerequisites: PSYC 5131 and PSYC 6032. Admission to the Clinical Psychology or, School Psychology, or Health Service Psychology programs.*

PSYC 6134 Biological Basis of Behavior
Credit: 3 | Lecture: 3 | Lab: 0
The role of the nervous system in perception, movement, drives, emotions, higher mental processes, and mental illness.

PSYC 6137 Family Research
Credit: 3 | Lecture: 3 | Lab: 0
Overview of research methods with a focus on research in family process and family therapy. *Prerequisites: PSYC 5236. Admission to the Family Therapy program.*

PSYC 6138 Design/Evaluation of School Health Programs
Credit: 3 | Lecture: 3 | Lab: 0
This course will cover the eight components of the CDC Coordinated School Health Model and address the current health issues facing school-aged children. The course will also include a review of school-based crisis prevention/intervention. (Cross-listed with PSYC 7331.) *Prerequisites: School Psychology SSP or by instructor permission.*

PSYC 6139 Intervention I: Academic and Cognitive Skills
Credit: 3 | Lecture: 3 | Lab: 0
Overview and clinical practice of research-based interventions to promote academic and cognitive skills in school-aged children. Topics include bilingual education, preschool education standardized academic achievement measures, curriculum-based assessment, and design of reading, math, and written expression interventions. *Prerequisites: Admissions to the School Psychology program or permission of instructor.*

PSYC 6230 Intervention II: Social and Behavioral Skills
Credit: 3 | Lecture: 3 | Lab: 0
Overview and clinical practice in school, community, and family interventions that promote safe schools and social competence among children and youth. *Prerequisites: PSYC 6139. Admission to the School Psychology program or permission of instructor.*
PSYC 6231 Intervention III: Affective and Adaptive Skills  
Credit: 3 | Lecture: 3 | Lab: 0  
Theories and evidence-based counseling interventions for youth (e.g., Cognitive Behavior Therapy, Motivational Interviewing, Mentoring); field-based experience; crisis intervention; prevention issues.  
Prerequisites: Admission to School Psychology program; successful completion of PSYC 5131, PSYC 6133, and PSYC 6139.

PSYC 6233 Advanced Family Therapy  
Credit: 3 | Lecture: 3 | Lab: 0  
In-depth review of family systems and family therapy paradigms.  
Prerequisites: PSYC 5233. Admission to the Family Therapy program or permission of instructor. Must be taken in conjunction with/or PSYC 5731.

PSYC 6234 Systems and Symptoms  
Credit: 3 | Lecture: 3 | Lab: 0  
In-depth study of systems theory with emphasis on clinical implications.  
Prerequisites: PSYC 6233. Admission to the Clinical Psychology, School Psychology, or Family Therapy program.

PSYC 6235 Behavioral/Cognitive Therapies  
Credit: 3 | Lecture: 3 | Lab: 0  
Application of principles of behavior and cognition to individual therapy.  
Prerequisites: Pre- or Co-requisite: PSYC 5235 or previous course in learning. Admission to the Clinical Psychology, School Psychology, or Family Therapy program.

PSYC 6236 Child and Adolescent Family Therapy  
Credit: 3 | Lecture: 3 | Lab: 0  
Family therapy approaches to problems of children and adolescents; focus on multiple contexts such as family, school, and community.  
Prerequisites: PSYC 5233 and PSYC 5234. Admission to the Family Therapy program.

PSYC 6238 Applied Behavior Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
The use of learning principles in applied areas such as education, business, health, and human services.  
Prerequisites: Pre- or Co-requisite: PSYC 5235 or equivalent.

PSYC 6239 Behavioral Interventions I  
Credit: 3 | Lecture: 3 | Lab: 0  
Specialized application of behavior analytic principles and methods, focusing on acquisition, maintenance, and generalization of behavior; requires up to 10 hours per week of field activities.  
Prerequisites: PSYC 5235, PSYC 6238, PSYC 6338, and PSYC 6339.

PSYC 6330 Research and Practicum in Applied Behavior Analysis  
Credit: 3 | Lecture: 0 | Lab: 0  
Supervised application of behavior analytic principles and methods in community settings. Completion of a research project is required. Students may enroll in this course twice, for up to six hours of credit.  
Prerequisites: PSYC 6239, PSYC 6331, PSYC 6338, and PSYC 6339.
PSYC 6331 Behavioral Interventions II  
Credit: 3 | Lecture: 3 | Lab: 0  
Specialized application of behavior analytic principles and methods, focusing on the reduction of behavior disorders; requires up to 10 hours per week of field activities.  
Prerequisites: PSYC 6031, PSYC 6338, and PSYC 6339.

PSYC 6332 Advanced Consultation and Program Design/Evaluation  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Admission to the School Psychology program, 40 hours of coursework that must include PSYC 6034 and PSYC 6139.

PSYC 6333 Research Design and Statistics for I/O Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
Application and design of research methodologies for organizations with a focus on action research, quasi-experimental design and interpretation of results.  
Prerequisites: Must have passed an undergraduate statistics class. Admission to the M.A. program in Industrial/Organizational Psychology or permission of instructor.

PSYC 6334 Research Design and Statistics II for I/O Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
Application and interpretation of statistical analysis and research results in organizations with a special emphasis on reporting and creating actionable items for organizational implementation.  
Prerequisites: PSYC 6333; Admission to the M.A. program in Industrial/Organizational Psychology or permission of instructor.

PSYC 6335 Research Methods in Neuroscience I  
Credit: 3 | Lecture: 2 | Lab: 2  
Overview and application of current methods and commonly-used techniques used in neuroscience research. Permission of instructor required.

PSYC 6336 Research Methods in Neuroscience II  
Credit: 3 | Lecture: 2 | Lab: 2  
Overview and application of current research methods and commonly-used techniques used in neuroscience research. Permission of instructor required.

PSYC 6337 Development and Treatment of Mood and Anxiety Disorders  
Credit: 3 | Lecture: 3 | Lab: 0  
This class will provide training and information regarding how mood and anxiety disorders develop, are maintained, and are most effectively treated. It will include the training on the empirically validated treatments for both mood and anxiety disorder. This class will enable students to develop a foundation for expertise in mood and anxiety disorders.
PSYC 6338 Ethics and Professional Issues in Behavior Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
Ethics and professional standards in the practice of behavior analysis.  
Prerequisites: Pre- or Co-requisite: PSYC 5235.  
Admission to the Behavior Analysis program or permission of instructor.

PSYC 6339 Research Methods in Behavior Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
Application and design of research methodologies for behavior analysis. Topics include measurement, experimental design, data analysis, social validity, and ethical considerations.  
Prerequisites: Pre- or Co-requisite: PSYC 5235.  
Admission to the M.A. program or Graduate Certificate in Behavior Analysis or permission of instructor.

PSYC 6430 Verbal Behavior  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to present a conceptual, basic experimental, and applied approach to the study of verbal behavior (language and communication) from a behavior-analytic perspective.  
Prerequisites: PSYC 5235

PSYC 6431 User-Centered Design  
Credit: 3 | Lecture: 3 | Lab: 1  
Study of the way users should be included in the design process including needs analysis, requirements writing, iterative testing of low/medium/high fidelity prototypes, and implementation of requirements and evaluations. Students will independently apply the UCD process to an applied problem.

PSYC 6432 Seminar in Advanced Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of advanced topics in statistics, e.g., multiple regression, meta-analysis, and signal-detection analysis.  
Prerequisites: Pre- or Co-requisite: graduate-level statistics course.

PSYC 6434 Human Factors Engineering  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis of principles of human factors, along with introduction and overview of the HF/E disciplines.

PSYC 6435 Human Factors Methods and Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of human factors methods necessary for developing and testing human-machine interfaces and systems that support efficient and effective performance.
**SENG Systems Engineering**

**SENG 5130 Systems Engineering Processes**  
Credit: 3 | Lecture: 3  
Detailed coverage of the systems engineering process and system engineering tools that facilitate implementation of the process. Covers the complete systems life cycle from needs assessment and feasibility analysis through requirements, design and testing to system retirement and disposal. The student will gain an in-depth understanding of the International Council on Systems Engineering Capability Maturity Model including assessments and process improvement. The student will also gain proficiency in the use of commercial system engineering tools that facilitate the implementation and management of the systems engineering process.  
*Prerequisites: Foundation courses.*

**SENG 5230 Systems Engineering Economics**  
Credit: 3 | Lecture: 3  
Engineering and economic fundamentals, issues and goals of SENG. Life and project cycles of systems, supersystems and subsystems. Trade-off studies involving cost-effectiveness analysis; multiple-goal decision analysis; and dealing with uncertainties, risk and the value of information.

**SENG 5231 Concurrent Engineering**  
Credit: 3 | Lecture: 3  
Determining needs and organizing teams from the multiple disciplines required for integrated system and product development. Technical and management issues and methods of involving end users, suppliers, service providers and engineering specialists to work with the SENG team on concurrent activities throughout the system's life cycle.

**SENG 5232 Engineering Specialty Integration**  
Credit: 3 | Lecture: 3  
Coordination of engineering specialties across multiple disciplines in reliability, quality assurance, maintainability, integrated logistics support, verification, predictability, social acceptability, automated support environments, etc.

**SENG 5233 Systems Engineering Analysis and Modeling**  
Credit: 3 | Lecture: 3  
This course presents the fundamentals of systems analysis and modeling. The emphasis is on solving practical modeling problems for continuous, discrete and hybrid systems, both linear and nonlinear. Systems will be modeled using modern tools such as MATLAB and Simulink.  
*Prerequisites: SENG 5231 and SENG 5232 or permission of instructor & adviser.*
SENG 5330 Risk Management
Credit: 3 | Lecture: 3
Continuous Risk Management is a system engineering practice with processes, methods and tools for managing risks in a project. It provides a disciplined environment for proactive decision making to assess continuously what could go wrong (risks), determine which risks are important to deal with and implement strategies to deal with those risks. The purpose of this course is to explain what Continuous Risk Management is; to help the student understand the principles, functions, methods and tools; to show what it could look like when implemented within a project; and to show how a project could implement its own adaptation.

Prerequisites: Foundation courses.

SENG 5332 Decision Analysis for Systems Engineering
Credit: 3 | Lecture: 3
Understanding the theory and learning how to apply, formulate, solve and interpret system engineering problems using decision analysis and operations research techniques. Theory and techniques include decision analysis, linear programming, simplex method, sensitivity analysis, network modeling, integer linear programming and goal programming.

Prerequisites: Foundation courses.

SENG 5334 Human Factors Engineering
Credit: 3 | Lecture: 3
This course presents the consideration of whether people serve as operators, maintainers or users in the system. The course advocates systematic use of such knowledge to achieve compatibility in the design of interactive systems of people, machines and environments to ensure their effectiveness, safety and ease of performance.

Prerequisites: Foundation courses.

SENG 5335 Healthcare Systems Engineering
Credit: 3 | Lecture: 3
Healthcare Systems Engineering integrates key concepts of systems engineering with the special challenges of complex health care systems. The course provides a comprehensive overview of the healthcare system, healthcare delivery, and healthcare systems modeling. The course includes numerous examples, case studies, and learning activities to thoroughly explain the concepts presented, including healthcare systems, delivery, quantification, and design. The course addresses variety of healthcare systems engineering challenges in patient flow, financial aspects, health data informatics and analytics, lean and six sigma, patient safety, capacity management and logistics, and the health supply chain.
SENG 5336 Healthcare Systems Analytics and Optimization  
Credit: 3 | Lecture: 3  
Healthcare delivery presents numerous systems analysis problems including diagnosis, forecasting, scheduling, and optimization. The objective of this course is to provide students with an overview of systems analysis and optimization in healthcare decision making. Students will apply statistical methods including Bayesian belief networks and Dempster–Shafer theory, linear and nonlinear optimization techniques including simplex and greedy–based algorithms, and Monte Carlo modeling. Students will be exposed to several real-world projects for health care. Students will learn about current problems in healthcare systems.

SENG 5337 Healthcare Systems Integration  
Credit: 3 | Lecture: 3  
Healthcare Systems Integration introduces the design process for a typical healthcare system. The course provides a comprehensive overview of the healthcare system, communication, security, and robots in healthcare systems. Electronic instruments from sensor to computer are considered. Static and dynamic characteristics of components and systems are examined theoretically and empirically. General healthcare systems are designed, constructed, and tested. A variety of healthcare applications of instrumentation are discussed.

SENG 5332 Advanced Decision Analysis for Systems Engineering  
Credit: 3 | Lecture: 3  
Builds upon the fundamentals of Decision Analysis for Systems Engineering, with topics in non–linear methods for decision making, numerical techniques, regression analysis and discriminant analysis.  
Prerequisites: SENG 5332.

SENG 5739 Internship in Systems Engineering  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: Approval by adviser and associate dean.

SENG 5915 Cooperative Education Work Term  
Credit: 1 | Lecture: 1  
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description.)  
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

SENG 5931 Research Topics in Systems Engineering  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

SENG 5939 Independent Study in Systems Engineering  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.
SENG 6837 Systems Engineering Capstone Project  
Credit: 3 | Lecture: 3  
Teams will meet on a weekly basis with their faculty mentor to discuss progress.  
Prerequisites: Completion of at least 18 hours of the core curriculum including systems engineering project.

SENG 6939 Master’s Thesis Research  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of faculty adviser, master’s committee and dean.

SENG 6969 Master’s Thesis Research  
Credit: 6 | Lecture: 6  
Prerequisites: Approval of faculty adviser, master’s committee and dean.

SILC Studies in Language and Culture

SILC 4301 Spanish for Bilingual Teachers  
Credit: 3 | Lecture: 3 | Lab: 0  
Development of advanced reading and writing skills in Spanish with special emphasis on communication with the bilingual community. Course taught in Spanish.  
Prerequisites: Fluency in Spanish.

SILC 4302 Introduction to the Study of Languages  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of phonology, morphology, syntax and semantics of the English language.

SILC 4310 Foundations of Bilingual and ESL Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of social, political, economic and educational issues related to the development and implementation of bilingual education and ESL programs.

SILC 4311 ESL Methods  
Credit: 3 | Lecture: 3 | Lab: 0  
Emphasis on teaching English to second language learners in the ESL classroom and on putting theory into practice.

SILC 4312 Content-Based ESL  
Credit: 3 | Lecture: 3 | Lab: 0  
Issues related to the integration of content with ESL instruction. Field experiences required.

SILC 4313 Language Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis of language acquisition and second language learning.

SILC 4315 Theories of American Pluralism  
Credit: 3 | Lecture: 3 | Lab: 0  
A review of theoretical foundations of pluralism and their impact on mainstream America.

SILC 4316 Bilingual Curriculum in the Content Areas  
Credit: 3 | Lecture: 3 | Lab: 0  
Study and design of the content area curriculum within a bilingual education program. Course taught in Spanish and English.  
Prerequisites: Fluency in Spanish and SILC 4301.
SILC 4351 Development of Biliteracy  
**Credit: 3 | Lecture: 3 | Lab: 0**  
A comprehensive study of theories and research dealing with the development of biliteracy. Course taught in Spanish and English.  
*Prerequisites: Fluency in Spanish and SILC 4301.*

SILC 5010 Professional Preparation Seminar for Educators of English Language Learners  
**Credit: 1 | Lecture: 1 | Lab: 0**  
This course is designed to assist students in the ESL Supplemental certification plan to understand the state certification standards for successful entry into their chosen educational field. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plan.  
*Prerequisites: An approved, signed degree plan on file in the COE.*

SILC 5031 Curriculum Issues in Educating the Bilingual Student  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is about the study and design of the curriculum for bilingual education programs with emphasis on teaching academic content areas and vocabulary development (mathematics, social sciences, and sciences). Course taught in Spanish.  
*Prerequisites: Fluency in Spanish*

SILC 5032 Applied Linguistics for Bilingual Education/ESL  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is about the analysis of language development, language acquisition, and language use.

SILC 5033 Cross-Curricular Literacy for Second Language Learners  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course includes research, theory, and practice in the development of reading and writing skills for second language learners in all content areas.

SILC 5034 Community Collaboration  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is about establishing partnerships to meet the needs of diverse communities. Field experiences required.  
*Prerequisites: SILC 6030.*

SILC 5035 Interpersonal Interactions in Diverse Settings  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Emphasis on developing and understanding of the implications of cross-cultural differences and similarities and the skills required for professionals working within a diverse setting.

SILC 5036 Multicultural Curriculum Development  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is the study of materials, strategies, and issues related to the development of multicultural curricula. Addresses the needs of general education, special education, early childhood education, and reading/library resource personnel.  
*Prerequisites: SILC 6030.*

SILC 5130 Theory and Research in Bilingual and ESL Education  
**Credit: 3 | Lecture: 3 | Lab: 0**  
This course is a survey of theoretical, historical, legal, and sociocultural basis of bilingual education and ESL programs.
SILC 5134 Second Language Teaching  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the trends, issues, and practices related to the teaching of English as a second language.

SILC 5531 Literacy for Spanish-Speaking Students  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a study of traditional and contemporary views of literacy in Spanish. Focus on teaching Spanish language arts and reading to students whose first language is Spanish. 
Course taught in Spanish.  
*Prerequisites: Fluency in Spanish.*

SILC 5931 Research Topics in the Studies of Language and Culture  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by title each time course offered.

SILC 5939 Independent Study in Language and Culture  
Credit: 3 | Lecture: 3 | Lab: 0  
*Prerequisites: Approval of instructor and associate dean.*

SILC 6030 Foundations of Multicultural Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This course discusses social, cultural, and legal issues regarding diversity in the United States.

SILC 6031 Social Justice Leadership, Policy and Advocacy  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines leadership issues within current local and national policies.

SILC 6032 Models of Language  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a study of the components of language and the use of phonology, morphology, syntax, and semantics to describe them. Focuses on describing languages and dialectical variations.

SILC 6033 Reflection in Social Justice Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on self-awareness and reflection regarding social justice issues and their impact on engagement and advocacy.

SILC 6034 Current Issues in Diverse Communities  
Credit: 3 | Lecture: 3 | Lab: 0  
This course addresses current social justice research, issues, and trends in local, national, and global contexts.

SILC 6035 Social Foundations of Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the social, historical, and philosophical foundations of education.

SILC 6036 Equity Pedagogy  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines strategies in developing, implementing, and evaluating curriculum and instruction within a social justice framework.

SILC 6734 Studies in Language & Culture Graduate Seminar  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will involve demonstration of acquired competencies through research on multicultural and linguistic issues. A written paper and presentation will be required.  
*Prerequisites: Approval of associate dean*
SILC 6739 Studies in Language and Culture Practicum  
Credit: 3 | Lecture: 3 | Lab: 0  
Supervised practice under the guidance of a selected professor.  
*Prerequisites: Approval of associate dean, completion of core courses, completion of Area of Concentration courses.*

SILC 7030 Intercultural Communication  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the understanding of cultural issues that influence communication effectiveness with diverse populations.

**SLIS School Library and Information Science**

SLIS 5012 Professional Preparation Seminar for School Librarians  
Credit: 1 | Lecture: 1 | Lab: 0  
This course is designed to assist students in the School Library and Information Science Specialist certification plan to understand the state certification standards for successful entry into their chosen educational fields. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plans.  
*Prerequisites: An approved, signed degree plan on file in the COE.*

SLIS 5532 Selecting Literature and Materials for Young Adults  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is about the selection, evaluation, and strategies for use of literature in grades 8–12, including print and digital reading materials and other resources.

SLIS 5533 Selecting Literature and Materials for Children  
Credit: 3 | Lecture: 3 | Lab: 0  
This course examines the application of higher order thinking skills to reading in literature and the content areas.

SLIS 5534 Selecting Literature and Materials for Children  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

SLIS 5931 Research Topics in Library Science  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by title each time course is offered.

SLIS 5939 Independent Study in Library Science  
Credit: 3 | Lecture: 3 | Lab: 0  
*Prerequisites: Approval of instructor and associate dean.*

SLIS 6134 School Library Collection Development Management  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the philosophy, principles, and fundamentals of school library collection management including selection, acquisition, cataloging, circulation, and deselection of print and non-print materials.

SLIS 6136 Librarians as Instructional Partners  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the principles and fundamentals of collaborative planning and instruction in the school library.  
*Prerequisites: SLIS 6336*

SLIS 6234 Librarians Empowering Learners Through Advocacy Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the principles and methods of creating dynamic school library programs through collaboration with teachers, administrators, librarians, and the community.
SLIS 6334 Administration of School Library Services
Credit: 3 | Lecture: 3 | Lab: 0
This course examines the principles and illustrative practices in the organization, budgeting, policy making, facilities planning, and staffing of school libraries.

SLIS 6336 Media and Technology Selection and Application
Credit: 3 | Lecture: 3 | Lab: 0
This course is about the selection, evaluation, application, and integration of educational technologies and applications, including the design and production of media in school libraries.

SLIS 6338 School Library Systems & Services
Credit: 3 | Lecture: 3 | Lab: 0
This course is an introduction and evaluation of the current library reference, information, and retrieval systems and their applications in school libraries.

SLIS 6430 Research in Library Science
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the principles and fundamentals of action research in the school library to improve the way issues are addressed and problems are solved.

SLIS 6739 School Library Practicum
Credit: 3 | Lecture: 3 | Lab: 0
Supervised field experiences in EC-12, incorporating information skills instruction and practice in school library management. 
Prerequisites: Completion of 18 hours in the School Library Core and approval of the associate dean.

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SOCI Sociology

SOCI 5032 Mental Health and Illness
Credit: 3 | Lecture: 3 | Lab: 0
Overview of mental health and illness beginning with a comparison of the sociological perspective of mental illness to biological and psychological views. We will then examine how social factors relate to patterns of mental illness in society. Finally, we will examine various aspects of mental health systems and policies.

SOCI 5035 Human Rights and Social Justice
Credit: 3 | Lecture: 3 | Lab: 0
Examination of methods, theories, debates, and case studies related to human rights in the United States and globally. Students will gain skills required to conduct future research on the topic.

SOCI 5131 Contemporary Sociological Theory
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of major developments in sociological theory since 1930, including critical theory, feminist theory, post-modern theory, and rational choice theory.

SOCI 5133 Advanced Juvenile Delinquency
Credit: 3 | Lecture: 3 | Lab: 0
In-depth analysis of delinquency theories, issues, and policies in the U.S. and abroad. Topics include measurements and research, serious violent offenders, gangs, and treatment by justice agencies. (Cross-listed with CRIM 5133.)
SOCI 5136 Women and the Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Evolution of women's legal rights in the United States. Examination of contemporary issues in the context of human rights law. Legal status of women in economic, political, and judicial sectors.

SOCI 5137 Race and the Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Evolution of legal rights of race/ethnic groups in the U.S. from a sociological perspective. Examination of the civil rights movement, hate crimes, and Affirmative Action policy.

SOCI 5233 Religion and Immigration Studies in Houston  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of the dynamic relationship between religion and immigration with a specific focus on the role faith communities play in the migrant experience. (Cross-listed with SOCI 3317.)

SOCI 5236 Religion and Global Change  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of religion in the modern world, religious identities, and the process of secularization, all from a global, cross-cultural perspective. (Cross-listed with CRCL 5033.)

SOCI 5333 Minorities and Majorities  
Credit: 3 | Lecture: 3 | Lab: 0  
The pattern of interaction among race, ethnic, and gender groups; personality and structural effects of prejudice and discrimination. Course includes both U.S. and cross-cultural perspectives. (Cross-listed with PSYC 5534.)

SOCI 5334 Social Stratification  
Credit: 3 | Lecture: 3 | Lab: 0  
Patterns of social and economic inequality in the United States. Distribution of income and wealth, social mobility, life changes, education, and power. Class, race, and gender differences will be discussed as well as patterns of social change.

SOCI 5336 Law and Society  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of a number of problematic issues in contemporary American society from the perspectives of sociological, philosophical, and legal theories. Examination of the controversial ways our political system seeks to reconcile civil liberties with the collective obligations of the social contract. (Cross-listed with CRIM 5336.)

SOCI 5337 Complex Organizations  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of how complex organizations are used as "social tools" to attain specific ends; exploration of issues of organizational structure, goals, technology, boundaries, resources, power, organizational environments, and exercises in designing prototype organizations.

SOCI 5339 Leadership in Organizations  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of the topic of leadership in organizations from multiple perspectives including psychology, sociology, and management. (Cross-listed with PSYC 5333.)
SOCI 5433 Social Conflict and Mediation  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of theories of social conflict and application of dispute resolution/mediation techniques to needs of the community groups, courts, churches, businesses, and non-governmental agencies.

SOCI 5434 Marriage and Family  
Credit: 3 | Lecture: 3 | Lab: 0  
This graduate seminar will introduce students to a wide range of studies in the sociology of the family, improving their ability to analyze critically work in this field and inspiring students' own family-related research.

SOCI 5435 Gendered Inequality: Work and Family  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of two important institutions in American society: work and the family. Explanation of the way gender, work, and family life interconnect and influence each other.

SOCI 5438 Sociology of the Life Course and Aging  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction of students to the life course. In particular, the course introduces students to the theories, methods, and substantive topics which exemplify the life course paradigm.

SOCI 5533 Sociology of Human Intimacy  
Credit: 3 | Lecture: 3 | Lab: 0  
Inquiring into the forms and dynamics of human intimacy. Topics include attraction, sexuality, marriage and divorce, domestic violence, friendship, and loneliness.

SOCI 5534 Marriage and Family  
Credit: 3 | Lecture: 3 | Lab: 0  
This graduate seminar will introduce students to a wide range of studies in the sociology of the family, improving their ability to analyze critically work in this field and inspiring students' own family-related research.

SOCI 5437 Urban Problems  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of classical theories of urban life and urban development; exploration of urban problems such as crime, transportation, suburban conflict, and corresponding urban policy.

SOCI 5633 American Immigration Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the central concepts and major paradigms in the study of American immigration.

SOCI 5731 Politics and Protest  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of the issues of race, religion, sex, and gender in American politics and protests.

SOCI 5732 Seminar in Social Problems  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of contemporary social problems such as inequality, consumerism, genetics and various environmental issues using sociological theory, methods and contemporary films.

SOCI 5931 Research Topics in Sociology  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific topic each time the course is offered. Topics vary; may be repeated for credit with permission of instructor.
SOCI 5939 Independent Study in Sociology  
**Credit: 3 | Lecture: 0 | Lab: 0**  
Permission of adviser and instructor required. May be repeated for credit with permission of adviser and instructor.

SOCI 6432 Qualitative Research Methods  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Overview of qualitative research methods. During the semester, students will gain hands-on experience in qualitative research. Students will gain entry to a research site, collect qualitative data, and present research findings.

SOCI 6730 Advanced Non-Experimental Research and Statistics  
**Credit: 3 | Lecture: 3 | Lab: 1**  
Multivariate statistical analysis including advanced regression, ANOVA, and logistical regression. Students will develop a research project and do statistical analysis; may be part of a student M.A. thesis.

SOCI 6731 Graduate Research Methods  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Advanced study of logic, principles, and procedures involving techniques of data collection, organization, and statistical analysis. Students are encouraged to take Graduate Research Methods before taking Graduate Statistics.

SOCI 6734 Women’s Health  
**Credit: 3 | Lecture: 3 | Lab: 0**  
In-depth look at the social and political issues that shape women’s health, health care, and social and medical attitudes towards the female body. We will also explore how social and policy changes can improve—or threaten—women’s health.

SOCI 6737 Medical Sociology  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Examination of a conceptual and substantive overview of Medical Sociology, focusing on some of the most fundamental and salient sociological issues concerning health, illness, and health care. Using critical thought, students will apply various theoretical perspectives to the changing social reality of health and illness.

SOCI 6739 Graduate Internship  
**Credit: 3 | Lecture: 0 | Lab: 0**  
Capstone experience for graduate Sociology students. Minimum of two days a week in an approved internship setting. Written report required. Arrangements for internships should be completed by the beginning of the prior semester.  
*Prerequisites: 24 hours of graduate course credit before enrolling in internship as well as approval of the Sociology internship coordinator.*

SOCI 6909 Sociology Comprehensive Exam  
**Credit: 0 | Lecture: 0 | Lab: 0**  
The comprehensive exam will be either a research proposal developed by the student in consultation with a faculty adviser that synthesizes theory, a literature review, and methodology, or it will be a written exam that includes questions from all full-time Sociology faculty.

SOCI 6939 Master's Thesis Research  
**Credit: 3 | Lecture: 0 | Lab: 0**  
Approval of adviser, thesis director, and department chair required.
SPAN Spanish

SPAN 5031 Intensive Spanish I
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed to provide Spanish language proficiency and communication skills: listening, reading, speaking, and writing.

SPAN 5033 Intensive Spanish II
Credit: 3 | Lecture: 3 | Lab: 0
Development of Spanish communication skills: listening, reading, speaking, and writing.
Prerequisites: 1 semester of college Spanish or 2 years of high school Spanish.

SPAN 5035 Intensive Spanish III
Credit: 3 | Lecture: 3 | Lab: 0
Development of Spanish communication skills and cultural backgrounds.
Prerequisites: 2 semesters of college Spanish or 4 years of high school Spanish.

SPAN 5931 Research Topics in Spanish
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific topic each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

SPED Special Education

SPED 4300 Survey of Exceptionalities
Credit: 3 | Lecture: 3 | Lab: 0
The course will provide a study of teaching students with disabilities and diverse needs with an emphasis on making individualized effective instructional decisions.
Prerequisites: SPED 2301 or equivalent

SPED 4311 Assessment in Special Education
Credit: 3 | Lecture: 3 | Lab: 0
A survey of special education assessment procedures with a focus on alternate assessment procedures used in inclusive settings to link assessment and instruction.
Prerequisites: SPED 2301 or equivalent

SPED 4312 Diagnostic Instruction for Learners With Special Needs
Credit: 3 | Lecture: 3 | Lab: 0
Covers the development and application of curricula, materials, methodologies and classroom practices in response to the strengths and needs of all low-performing students in special education and inclusive settings. Field experiences required.
Prerequisites: SPED 2301 or equivalent, SPED 4311 or equivalent, concurrent enrollment in a TCED or LLLS methods course.

SPED 4313 Individualizing Instruction for Students With Disabilities
Credit: 3 | Lecture: 3 | Lab: 0
This course is for undergraduate students only. Covers necessary adaptations to meet the learning needs of exceptional students, for prescriptive models for intervention and ways of observing, recording and responding to behaviors. Field experiences required.
Prerequisites: SPED 2301, SPED 4311, SPED 4312, SPED 4321, SPED 4332 or equivalents.
SPED 4321 Implementing Positive Behavior Supports
Credit: 3 | Lecture: 3 | Lab: 0
A comprehensive study of related legal and social issues and the implementation of techniques for supporting students with challenging behaviors in home and school settings. Field experiences required. 
Prerequisites: SPED 2301

SPED 5010 Professional Preparation Seminar for Special Educators
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to prepare students to successfully complete the SPED TExES and is designed to assist students in the SPED Supplemental certification plan to understand the state certification standards for successful entry into their chosen educational fields. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification. 
Prerequisites: An approved, signed degree plan on file in the COE.

SPED 5030 Survey of Individual Differences
Credit: 3 | Lecture: 3 | Lab: 0
This course is a study of various theories of cognition and learning in relation to individuals with disabilities. Provides an in-depth study of various categories of disabilities to include characteristics, causation, and the course of disability throughout the life span.

SPED 5131 Educational Assessment of Exceptionalities
Credit: 3 | Lecture: 3 | Lab: 0
This course is a review of procedures used for diagnosing disabilities and an in-depth study of procedures used in special education settings with an emphasis on informal techniques, authentic assessment, and functional analysis of behavior. 
Prerequisites: SPED 5030 or equivalent.

SPED 5132 Curricular Approaches to Learning Difficulties
Credit: 3 | Lecture: 3 | Lab: 0
This course examines the causal factors and remedial alternatives for children with low performance records in regular school environments. 
Prerequisites: SPED 5030 or equivalent.

SPED 5133 Practicum in Inclusive Education
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the integration of content area knowledge, pedagogical theory, and collaborative practices that are essential in the delivery of specifically designed instruction. Approved practicum placements will emphasize application in inclusive settings. 
Prerequisites: SPED 5131, SPED 5132, SPED 5233

SPED 5233 Providing Positive Behavioral Support
Credit: 3 | Lecture: 3 | Lab: 0
This course is a study of the theoretical, legal, social, and philosophical issues related to the principles and practices for supporting students with challenging behaviors in school settings to include development of intervention plans. 
Prerequisites: SPED 5030 or equivalent.
SPED 5332 Evaluation, Assessment, and Program Planning for Young Children with Special Needs
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a comprehensive overview of early childhood intervention and special education by integrating theory, law, research, and current evidence-based practices associated with serving young children (birth to age eight), who present a wide range of special needs. Field experiences required.

SPED 5333 Advanced Interdisciplinary Studies in Young Children with Special Needs
Credit: 3 | Lecture: 3 | Lab: 0
This is an advanced study of the education of young children with disabilities and their families. Content explores researching program designs and an eclectic blend of approaches and strategies that can be utilized to meet individual child needs.

SPED 5737 Practicum: Young Children with Special Needs
Credit: 3 | Lecture: 3 | Lab: 0
This is the completion of all prior course work for the Early Childhood Handicapped Endorsement. It includes fieldwork with infants and/or young children with disabilities; not limited to school, agency or privately funded programs.
Prerequisites: ECED 5332/SPED 5332 and ECED 5333/SPED 5333.

SPED 5931 Research Topics in Special Education
Credit: 3 | Lecture: 3 | Lab: 0
Identified by title each time course is offered.

SPED 5939 Independent Study of Exceptionalities
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

STAT Statistics

STAT 3308 Computational Statistics
Lecture: 0 | Lab: 1
Descriptive statistics, basic probability concepts, normal distribution, parameter estimation, testing of hypothesis, correlation and regression, statistical computation using Excel.
Prerequisites: MATH 1314 or equivalent. Not available for mathematics majors.

STAT 3334 Probability and Statistics for Scientists and Engineers
Credit: 3 | Lecture: 3
Graphical representation of data, measures of centrality and variability, concepts and rules of probability, discrete probability distribution, normal distribution, sampling distributions, central limit theorem, parameter estimation, testing of hypothesis, two sample methods, analysis of variance, correlation and regression analysis.
Prerequisites: MATH 2413, MATH 2414; Not available for mathematics majors.

STAT 4344 Introduction to Probability
Credit: 3 | Lecture: 3
Sample space, probability function, combinatorics, discrete and continuous random variables, special probability distributions, moment generating function, multivariate distributions and central limit theorem.
Prerequisites: MATH 2414
STAT 4345 Introduction to Statistics  
Credit: 3 | Lecture: 3  
Sampling distributions, point and interval estimation, hypothesis testing, regression and correlation, nonparametric statistics, analysis of variance.  
Prerequisites: MATH/STAT 4344

STAT 5135 Applied Statistical Methods  
Credit: 3 | Lecture: 3 | Lab: 0  
One and two sample methods, analysis of variance, correlation and regression, analysis of covariance, statistical modeling and robustness. Introduction to statistical computation using Excel and statistical software packages. Not available for graduate credit for statistics majors.  
Prerequisites: STAT 3308 or equivalent.

STAT 5431 Advanced Probability  
Credit: 3 | Lecture: 3  
Probability axioms and properties, conditional probability, random variables, probability distributions, moment generating function, laws of large numbers and central limit theorem.  
Prerequisites: MATH 4344

STAT 5432 Principles of Statistical Inference  
Credit: 3 | Lecture: 3  
Point and interval estimation, testing of hypotheses, nonparametric methods, regression, analysis of variance, robustness and model fitting.  
Prerequisites: STAT 5431.

STAT 5531 Multivariate Statistical Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
The study of multivariate normal distribution, estimation of mean and covariance matrix. T2-statistic, Wishart analysis, principal components and factor analysis and other techniques as applied to industrial and decision processes.  
Prerequisites: MATH 4345 or equivalent.

STAT 5532 Linear Models and Regression Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
Distributions of quadratic forms, general linear models, least squares estimation, hypothesis testing, confidence intervals, multiple regression, variable selection, residual analysis and regression diagnostics.  
Prerequisites: MATH 4345 or equivalent.

STAT 5533 Statistical Computing  
Credit: 3 | Lecture: 3 | Lab: 0  
Data management, reporting, graphical displays, macros, statistical analysis and interpretation and related topics.  
Prerequisites: MATH 4345 or equivalent.

STAT 5534 Sampling Methods  
Credit: 3 | Lecture: 3 | Lab: 0  
Sampling from finite populations, sampling strategies, estimation procedures including ratio and regression estimation, large scale sample survey methods for quality control and applied research in agriculture, business, social sciences and other fields.  
Prerequisites: MATH 4345 or equivalent.
STAT 5535 Experimental Designs and Analysis
Credit: 3 | Lecture: 3 | Lab: 0
Completely randomized design, randomized blocks, Latin squares, factorial experiments, confounding and fractional factorial designs for industrial experiments and applications.
Prerequisites: MATH 4345 or equivalent.

STAT 5537 Elements of Statistical Learning
Credit: 3 | Lecture: 3
Univariate statistical modeling, model-fit tests, model comparisons, logistic models, time series and spectral analysis, non-linear models, bootstrap methods and simulations.
Prerequisites: STAT 4345 and some programming background in R/Python.

STAT 5538 Categorical Data Analysis
Credit: 3 | Lecture: 3 | Lab: 0
Introduction and inference for binomial and multinomial observations using proportions and odds ratios; generalized linear models for discrete data; logistic regression for binary responses; alternative modeling for binary responses; logit models for nominal and ordinal responses; inference for matched-pairs.
Prerequisites: STAT 4345 or equivalent

STAT 5631 Survival Analysis
Credit: 3 | Lecture: 3
Measures of failure, reliability function, failure models, life testing and censoring, system reliability, parameter estimation and testing regression models, Cox proportional hazard models and software reliability.
Prerequisites: MATH 4345 or equivalent.

STAT 5634 Data Visualization and Graphical Tests
Credit: 3 | Lecture: 3
The objective of this course is to introduce data visualization techniques and related statistical testing procedures. Topics include data exploration, basic graphical techniques in R and SAS, graphical model diagnostic tools, graphical tests, cluster analysis, classification and regression trees.
Prerequisites: STAT 4345 and some programming background in R/Python.

STAT 5635 Applied Time Series Analysis
Credit: 3 | Lecture: 3
The objective of this course is to apply statistical methods for the analysis of data that have been observed over time. Topics include moving average, auto-regression, spectral analysis, modelling and forecasting.

STAT 5636 Bayesian Data Analysis
Credit: 3 | Lecture: 3
The objective of this course is to introduce main concepts in Bayesian philosophy and broaden the statistical thinking. Topics include Bayesian vs frequentist thinking, Bayes theorem, conjugate and nonconjugate priors, grid-based simulations, MCMC simulations, Gibbs and Metropolis–Hastings algorithms, linear models, and hypothesis tests.
STAT 5637 Applied Stochastic Models  
Credit: 3 | Lecture: 3  
Formulation and analysis of stochastic models with particular emphasis on applications; elements of stochastic processes; homogeneous, nonhomogeneous and compound Poisson processes; Markov Chain; transient and steady-state properties of Markov processes in discrete and continuous time; basic renewal theory.

STAT 5739 Internship in Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: Approval by adviser and associate dean.

STAT 5915 Cooperative Education Work Term  
Credit: 1 | Lecture: 1 | Lab: 0  
Educational paid work assignment by a student in the field of career interest and course of study. A technical report will be required at the end of the semester. (Specific requirements are noted in the Cooperative Education Catalog description).  
Prerequisites: Approved Candidate Plan of Study, completed cooperative education file and approval of associate dean and Director of Cooperative Education.

STAT 5919 Independent Study in Statistics  
Credit: 1 | Lecture: 1 | Lab: 0  
Prerequisites: Approval of instructor, chair and associate dean.

STAT 5931 Research Topics in Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

STAT 5939 Independent Study in Statistics  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.

STAT 6837 Statistics Research and Consulting I  
Credit: 3 | Lecture: 3  
Each student will develop a research proposal which allows integrating statistics knowledge and data analysis procedures. A written proposal will be required.  
Prerequisites: STAT 5531 or STAT 5532.

STAT 6838 Statistics Research and Consulting II  
Credit: 3 | Lecture: 3  
Each student will carry out analyses of data and develop inferences. A written paper and a presentation will be required.  
Prerequisites: STAT 6837.

STAT 6939 Master's Thesis Research  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of faculty adviser, master's committee and dean.

SWEN Software Engineering

SWEN 4342 Software Engineering  
Credit: 3 | Lecture: 3  
Introduction to Software Engineering. Major phases of the software life cycle are introduced from requirements through maintenance.  
Prerequisites: A course in programming in a high level language, Data Structures recommended.
SWEN 5130 Requirements Engineering
Credit: 3 | Lecture: 3
Current techniques, methods, tools and processes used in requirements analysis, definition and specification, including system modeling.
Prerequisites: SWEN 4342 or SWEN 5432.

SWEN 5131 Software Engineering Tools
Credit: 3 | Lecture: 3
Current tools used in industry to support various phases of software development are covered such as Rational Rose, Objectory Process, as well as coverage of object-oriented modeling using UML (Unified Modeling Language)
Prerequisites: SWEN 4342 or SWEN 5432.

SWEN 5132 Software Design Patterns
Credit: 3 | Lecture: 3
This course provides an in-depth view of software design patterns; the recurring solutions to common problems in software design. It provides opportunities for learning the most advanced features of modern software development methodology. Topics include Design visualization, Creational, Structural and Behavioral Design Patterns, Anti-patterns, Service Oriented Architecture pattern, Secure usability and Pattern languages.
Prerequisites: SWEN 5235

SWEN 5133 Aspect-Oriented Development
Credit: 3 | Lecture: 3
Aspect-Oriented software development (AOD) is a new programming paradigm that increases modularity with a separation of cross-cutting concerns. This course provides a broad perspective of AOD. The topics include: Aspect-Oriented design in C# and visual programming languages, separation of concern in .Net web development, visual simulations, patterns and frameworks, aspects design in video game and robotics software development.
Prerequisites: A course in data structures.

SWEN 5134 Gaming Software Development with Service Oriented Architecture
Credit: 3 | Lecture: 3
This course provides an in-depth study of computer game development technology based on SOA architecture; the design principles, architecture pattern, dynamic interoperability, visual simulation, web gaming services and technology infrastructures. Students will experience the advanced computer gaming technologies based on the emerging information service architecture.
Prerequisites: SWEN 5232.

SWEN 5135 Configuration Management
Credit: 3 | Lecture: 3
This course examines configuration management including configuration item identification, change reporting and evaluation, change execution, version control, and configuration and change control tools, techniques and methods, as well as management principles related to configuration control.
Prerequisites: SWEN 5235 and SWEN 5237
SWEN 5136 Software for Robotics
Credit: 3 | Lecture: 3
This course addresses the design and implementation of software to control autonomous robotic devices to perform special tasks under various conditions. It provides a study of programming issues of robotics control for individual and multiple cooperating robots, including design principles, theories, graphical programming languages, algorithms, data acquisition and analysis, machine intelligence and techniques to develop autonomous robotics system with various sensors and actuators.
Prerequisites: A course in data structures.

SWEN 5137 Game Design and Development
Credit: 3 | Lecture: 3
Principles of game design and development of software for computer gaming.
Prerequisites: A course in data structures.

SWEN 5138 Design and Development of Virtual Worlds, Sims and Animation Scripting
Credit: 3 | Lecture: 3
Project-based course that involves the introduction to and development of Virtual World and Sims using 3-D graphic software and animation scripting languages. Development work will also include periodic oral presentations and project documentation. Students may be required to provide their own laptop and may be required to purchase special software.
Prerequisites: SWEN 5134.

SWEN 5139 Data Science and R in Software Engineering
Credit: 3 | Lecture: 3
"Course covers the breath of Data Science, how to identify the needs for big data in projects, how to create data sets, clean data sets, basic machine learning techniques, as well as how to create features and feature selection. Students will learn and apply the R programming language as well as JMP and Weka, and Tableau for data visualization.
Prerequisites: CSCI 2315 or SWEN 5236.

SWEN 5230 Software Project Management
Credit: 3 | Lecture: 3
Issues faced in management of large software development projects; estimation, planning execution, monitoring, evaluation and refinement.
Prerequisites: CSCI 1320

SWEN 5232 Software Construction
Credit: 3 | Lecture: 3
Study of Modern Software Development design and implementation methods, as well as program and design analysis methods and implementation techniques. Course will involve the study of UML and .Net and C-sharp programming and as well as other current languages and as well as exercise common data structures such a stacks, queues, linked lists, arrays, heaps. Course is mainly a programming course.
Prerequisites: CSCI 2315
SWEN 5233 Software Architecture
Credit: 3 | Lecture: 3
Knowledge of complex programs recommended. Domain models, generic architectures and frameworks as well the context, scope, current and future state of software architecture.
Prerequisites: SWEN 5432.

SWEN 5234 Software Processes
Credit: 3 | Lecture: 3
Detailed coverage of the theory, application, assessment and evaluation of the Unified Process Model. Course will cover the process modeling, process assessment, quality assessment of process models and process improvement techniques.
Prerequisites: SWEN 5130, SWEN 5232, SWEN 5236.

SWEN 5235 Software Construction II
Credit: 3 | Lecture: 3
Continuation of the study of Modern Software Development with programming of more complex software and the associated design and implementation methods, analysis methods and implementation techniques. Agile based methods will be included. Course will also involve the study of UML and .Net and C-sharp programming. Course is mainly a programming course. Laboratory Instruction.
Prerequisites: SWEN 5130, SWEN 5232, SWEN 5236.

SWEN 5236 Engineering Software I
Credit: 3 | Lecture: 3
Modern programming techniques. Basic programming techniques using C/C++, Java, and other modern languages. Topics will include basic statements, declarations, data types, stream I/O, user defined classes and types, object oriented programming, exceptions and templates. Course will include programming surrounding the common data structures: arrays, linked lists, queues and stacks.

SWEN 5237 Engineering Software II
Credit: 3 | Lecture: 3
Modern programming techniques continued. Continuation of SWEN 5236 with review of intermediate programming topics including object-oriented programming structure and organization, requirements specification introduced. Programming topics will include recursion, design patterns, concurrent programming, graphical user interfaces, abstract data types, binary trees, binary search trees, heaps, hashing techniques, as well as the implementation of searching and sorting algorithms.
Prerequisites: SWEN 5130, SWEN 5232, SWEN 5236.
SWEN 5239 Agile Software Development
Credit: 3 | Lecture: 3
This course addresses the main Agile software development methodologies such as Scrum, Kanban, Lean, Extreme programming, crystal (XP), dynamic system development methods (DSDM), feature driven development (FDD). The course will implement the techniques with real world case studies. It will offer techniques to improve software development productivity via effective leadership and quantitative methods in software management.
Prerequisites: SWEN 5236 or a course in data structures.

SWEN 5430 Software Metrics
Credit: 3 | Lecture: 3
Theory, application and techniques of measurement and analysis. Process and product metrics.
Prerequisites: SWEN 5232, SWEN 5236.

SWEN 5431 Testing, Verification and Validation
Credit: 3 | Lecture: 3
Role of software testing, verification and validation (V&V) in the system life cycle. Current techniques, tools and methods are addressed as well as current testing and V&V standards.
Prerequisites: SWEN 5232, SWEN 5236.

SWEN 5432 Software Engineering Life Cycle
Credit: 3 | Lecture: 3
In-depth study of the front end of the software life cycle. Feasibility, Concept, Requirements, Specification, Architecture and detailed design methods are explored and exercised.
Prerequisites: SWEN 5234, SWEN 5235, SWEN 5237.

SWEN 5433 Software Design
Credit: 3 | Lecture: 3
Theory, application and techniques of software design, its representation and analysis, including domain modeling and analysis.
Prerequisites: SWEN 5235, SWEN 5237.

SWEN 5435 Personal Software Process
Credit: 3 | Lecture: 3
Examination, study and improvement of the students' personal software development practice and study of the process used to effect such improvement.
Prerequisites: A course on data structures or software development experience.

SWEN 5532 Software Safety
Credit: 3 | Lecture: 3
Analysis, design, verification and validation of mission and safety critical systems. Risk and hazard assessment, certification techniques and standards.
Prerequisites: SWEN 5130, SWEN 5232 and SWEN 5236.

SWEN 5534 Reuse and Reengineering
Credit: 3 | Lecture: 3
Engineering for and with reuse. Domain and application engineering and reverse and forward engineering.
Prerequisites: SWEN 5235, SWEN 5237.

SWEN 5739 Internship in Software Engineering
Credit: 3 | Lecture: 3
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.
Prerequisites: Approval by adviser and associate dean.
SWEN 5931 Research Topics in Software Engineering  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

SWEN 5939 Independent Study in Software Engineering  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.

SWEN 6837 Software Engineering Capstone Project  
Credit: 3 | Lecture: 3  
Students will be grouped into teams to undertake a software project utilizing the tools, techniques and skills acquired during their previous course work. Each team will be assigned to a client and will interact with that client to establish requirements, agree upon a design and achieve a successful acceptance test of the resulting software system. Teams will meet on a weekly basis with their faculty mentor to discuss progress.  
Prerequisites: Student must be in their last 9 hours of SWEN graduate study including the 3 hours of capstone in these 9 hours and must have completed all core courses.

SWEN 6838 Software Engineering Capstone Project  
Credit: 3 | Lecture: 3  
Students will be grouped into teams to undertake a software project utilizing the tools, techniques and skills acquired during their previous course work. Each team will be assigned to a client and will interact with that client to establish requirements, agree upon a design and achieve a successful acceptance test of the resulting software system. Teams will meet on a weekly basis with their faculty mentor to discuss progress.  
Prerequisites: Student must be in their last 9 hours of SWEN graduate study including the 3 hours of capstone in these 9 hours and must have completed all core courses.

SWEN 6939 Master’s Thesis Research  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of faculty adviser, master's committee and dean.

TCED Teacher Education

TCED 4100 Core Subjects Teacher Seminar  
Credit: 1 | Lecture: 1 | Lab: 0  
This course is designed to assist EC–6 and 4–8 and candidates seeking core subjects certifications to understand the State and federal rules and standards for their chosen fields. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plan. This course must be completed to be eligible for Internship I (TCED 4378).  
Prerequisites: Admission to Teacher Education Program and an approved, signed degree or certification plan on file in the COE.
TCED 4102 Secondary (4–8 and 7–12) Content Teacher Seminar
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to assist 4–8 and 7–12 candidates seeking content-specific certifications to understand the State and federal rules and standards for their chosen fields. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plan. This course must be completed to be eligible for Internship I (TCED 4378).
Prerequisites: Admission to Teacher Education Program and an approved, signed degree or certification plan on file in the COE.

TCED 4303 Creating Positive Learning Environments in EC-6
Credit: 3 | Lecture: 3 | Lab: 0
Theories and strategies for guiding young children’s behavior and for effectively managing EC-6 classroom environments. Focus will be on approaches that promote autonomy in children.
Prerequisites: Prerequisites or Corequisites: INST 3313, WRIT 3304 or WRIT 3307.

TCED 4304 Creating Positive Learning Environments in 4–8
Credit: 3 | Lecture: 3 | Lab: 0
Theories and strategies for guiding young adolescents' behavior and for effectively managing middle school classroom environments. The class focus will be on understanding the major concepts, principles, theories, and research underlying the philosophical foundations and organizational structure of developmentally appropriate middle-level programs and schools.
Prerequisites: Prerequisites or Corequisites: INST 3313 and one of the following: WRIT 3304, WRIT 3305, WRIT 3307, WRIT 3315.

TCED 4306 Creating Positive Learning Environments in 7–12
Credit: 3 | Lecture: 3 | Lab: 0
Theories and strategies for guiding adolescent learners' behavior and for effectively managing high school classroom environments. Focus will be on approaches that promote autonomy in adolescent learners.
Prerequisites: Prerequisites or Corequisites: INST 3313 and one of the following: WRIT 3304, WRIT 3305, WRIT 3306, WRIT 3307, WRIT 3315.

TCED 4321 Social Studies Methods for EC-6
Credit: 3 | Lecture: 3 | Lab: 0
Curriculum planning, instructional activities and assessment techniques for developing social studies knowledge, citizenship and critical thinking skills; emphasis on sound practice and research-based strategies for teaching social studies for EC-6 students. Field experiences required.
Prerequisites: Admission to the Teacher Education Program and successful completion of TCED 4303.
TCED 4322 Science Methods for EC-6
Credit: 3 | Lecture: 3 | Lab: 0
Development of science concepts in EC-6 instruction. An emphasis on curriculum materials and the process approach as a science teaching method. Field experiences required.
Prerequisites: Admission to the Teacher Education Program and successful completion of TCED 4303.

TCED 4323 Mathematics Methods for EC-6
Credit: 3 | Lecture: 3 | Lab: 0
Methods of developing students' understanding of mathematics; emphasis on problem solving with manipulative and curriculum materials appropriate for use with EC-6 students. Field experiences required.
Prerequisites: MATH 3302 and admission to the Teacher Education Program and successful completion of TCED 4303.

TCED 4331 Social Studies Methods for Grades 4-8
Credit: 3 | Lecture: 3 | Lab: 0
Curriculum planning, instructional activities and assessment techniques for developing social studies knowledge, citizenship and critical thinking skills; emphasis on best practice and research-based strategies for teaching social studies to students in grades 4-8. Field experiences required.
Prerequisites: Admission to Teacher Education Program and successful completion of TCED 4304.

TCED 4332 Science Methods for Grades 4-8
Credit: 3 | Lecture: 3 | Lab: 0
Development of science concepts and teaching strategies for grades 4-8. Emphasis on the inquiry approach to teaching science consistent with concepts of cognitive development. Integrated Physics and Chemistry will also be addressed as well as the use of technology in the science classroom. Field experiences required.
Prerequisites: Admission to Teacher Education Program and successful completion of TCED 4304.

TCED 4333 Mathematics Methods for Grades 4-8
Credit: 3 | Lecture: 3 | Lab: 0
Methods of developing students' understanding of mathematics. Emphasis on problem solving with manipulative and curriculum materials appropriate for use with students in grades 4-8. Algebraic and graphing technology will be addressed. Field experiences required.
Prerequisites: MATH 1315, admission to Teacher Education Program and successful completion of TCED 4304.

TCED 4361 Methods in Secondary Social Studies
Credit: 3 | Lecture: 3 | Lab: 0
Strategies for developing social studies activities; emphasis on instructional techniques, content disciplines, local community, values and controversial issues and national trends. Field experiences required.
Prerequisites: Admission to the Teacher Education Program and successful completion of TCED 4306.
TCED 4362 Methods in Secondary Science
Credit: 3 | Lecture: 3 | Lab: 0
Strategies for teaching secondary science; emphasis on laboratory management and safety, development of scientific reasoning and issues and trends in secondary science education. Field experiences required.
Prerequisites: Admission to the Teacher Education Program and successful completion of TCED 4306.

TCED 4363 Methods in Secondary Mathematics
Credit: 3 | Lecture: 3 | Lab: 0
Strategies for teaching secondary mathematics; emphasis on instructional techniques appropriate for secondary mathematics, development of problem-solving skills and issues and trends in secondary mathematics education. Field experiences required.
Prerequisites: MATH 3304 or equivalent, admission to the Teacher Education Program and successful completion of TCED 4306.

TCED 4378 Pre-Service Internship I
Credit: 3 | Lecture: 3 | Lab: 0
Field experiences required in a public school setting. TCED 4100 or TCED 4102 must be taken prior to consideration for Internship I (TCED 4378).
Prerequisites: Approval of associate dean and completion of WRIT 3307 with a grade of C+ or better.

TCED 4678 Post-Degree Internship I
Credit: 6 | Lecture: 6 | Lab: 0
Post-baccalaureate internship with joint supervision by the school district where the intern is employed and the UHCL Center for Professional Development of Teachers. Field experiences required in a public school setting.
Prerequisites: Approval of associate dean.

TCED 4679 Post-Degree Internship II/Student Teaching
Credit: 6 | Lecture: 6 | Lab: 0
Post-baccalaureate internship with joint supervision by the school district where the intern is employed and the UHCL Center for Professional Development of Teachers. Field experiences required in a public school setting.
Prerequisites: TCED 4378 and approval of the associate dean.

TCED 4978 Pre-Service Internship II/Student Teaching
Credit: 9 | Lecture: 9 | Lab: 0
Field experiences required in a public school setting.
Prerequisites: TCED 4378 and approval of the associate dean.

TCED 5010 Professional Preparation Seminar
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to assist students to understand the state certification standards for successful entry into their chosen educational fields. Completion of the course is dependent upon candidates passing all state assessments required for their degree/certification plans.
Prerequisites: An approved, signed degree or certification plan on file in the COE.

TCED 5014 Mentoring and Cognitive Coaching
Credit: 1 | Lecture: 1 | Lab: 0
This course enables participants to apply peer mentoring and cognitive coaching theories and will include observation and feedback techniques.
TCED 5030 Models of Teaching
Credit: 3 | Lecture: 3 | Lab: 0
This course is an analysis of the knowledge base for instruction and development of proficiency in a variety of teaching models. Field experiences is required for students seeking teacher certification.

TCED 5031 Curriculum Planning
Credit: 3 | Lecture: 3 | Lab: 0
In this course, candidates will design and evaluate curriculum for early childhood through twelfth grade; study of curriculum theory, design principles, issues, and trends.
Prerequisites: TCED 5030.

TCED 5032 Preparation for K-12 Educators for National Board for Professional Teaching Standards I
Credit: 3 | Lecture: 3 | Lab: 0
This course is an initial preparation for educators grades K-12 for National Board for Professional Teaching Standards. Course includes preparation for description, analysis, and reflection upon professional development and teaching to match the requirements for the national standards.
Prerequisites: Three years of teaching experience.

TCED 5033 Preparation for K-12 Educators for National Board for Professional Teaching Standards II
Credit: 3 | Lecture: 3 | Lab: 0
This course includes preparation for the professional teaching portfolio, the description, analysis, and reflection of the components of the portfolio, and preparation for the written examination.
Prerequisites: TCED 5032.

TCED 5034 Management Strategies for Creating a Positive Learning Environment
Credit: 3 | Lecture: 3 | Lab: 0
This course presents effective management strategies that can be implemented across content areas and grade levels. Field experience is required for students seeking teacher certification.

TCED 5035 Integrated Instruction: Models for Application
Credit: 3 | Lecture: 3 | Lab: 0
This course presents theories and strategies on effective approaches for interdisciplinary integration in all content areas. Using vertical alignment, these models will be applicable across Pre-K-12 curriculum.

TCED 5036 Issues of Pedagogy
Credit: 3 | Lecture: 3 | Lab: 0
This course is an in-depth examination of current curricular and instructional issues in research, specifically tied to students' teaching practices. One focus area will be assessment-data analysis, impact and implications.
Prerequisites: EDUC 6033 and TCED 5030.

TCED 5037 Assessment and Student Learning
Credit: 3 | Lecture: 3 | Lab: 0
This course analyzes formative and summative assessment theory and strategies for implementation in Pre-K-12 curricula.
Prerequisites: EDUC 6032 (or equivalent).
TCED 5038 Professional Development for Enhancing Teacher Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
This course presents strategies for generating a professional development plan and involves participation in self-selected professional activities (e.g., conference attendance and presentations, article and conference proposal writing, etc.). Content of the course involves examination of current research on teacher professional development and leadership.

TCED 5130 Generic Instructional Practices  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides analysis of the knowledge base for instruction and development of proficiency in a variety of teaching and training models which specifically addresses adult learners. This course is presented through on-line instruction.

TCED 5131 Content Information Organization and Delivery  
Credit: 3 | Lecture: 3 | Lab: 0  
This course presents information on the design and presentation of content to adult learners; study of content development and delivery is covered. The course is presented on-line.

TCED 5132 Teacher Leadership and Mentoring  
Credit: 3 | Lecture: 3 | Lab: 0  
Aspects of teacher leadership traits and qualities necessary for application in public schools; specifically for curriculum specialists, team leaders, or teacher mentors are addressed. This course also presents in-depth coverage of strategies and processes for mentoring teachers across all grade levels and content areas.

TCED 5133 Teaching Using the Brain  
Credit: 3 | Lecture: 3 | Lab: 0  
Theories and strategies for implementing aspects of how the brain functions and how the learning process occurs in learning environments. Focus will be on applying these strategies to aspects of classroom management, lesson planning, and instruction.

TCED 5136 Principles and Application of Andragogy  
Credit: 3 | Lecture: 3 | Lab: 0  
This course explores principles and theories of andragogy, as well as applications that best meet the needs of adult learning in training environments. This course is offered on-line.

TCED 5138 Training and Professional Development  
Credit: 3 | Lecture: 3 | Lab: 0  
This course presents strategies for generating professional development workshops and training for adult learners. It involves participation in self-selected professional activities (e.g., webinars). Aspects of leadership are explored as an aspect of professional development presentations. This course is offered on-line.
TCED 5231 Teaching Social Studies in the Elementary School  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on curriculum design, instructional models, and authentic assessment techniques for developing social studies knowledge, citizenship, and critical thinking skills; emphasis is on best practice and research-based strategies for teaching 4-8 students. Field experiences required.  
*Prerequisites: Admission to Teacher Preparation Program.*

TCED 5232 Teaching Science in the EC-6 Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the development of science concepts in EC-6 instruction. Emphasis is on curriculum materials and the process approach as a science teaching method. Field experiences required.  
*Prerequisites: Admission to Teacher Education Program.*

TCED 5233 Teaching Mathematics in the EC-6 Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the development of mathematical concepts and teaching strategies for EC-6. Emphasis is on problem solving with manipulative and curriculum materials appropriate for use with EC-6 students. Field experiences required.  
*Prerequisites: MATH 3032 and Admission to Teacher Education Program.*

TCED 5234 Social Studies Methods for the Secondary Grades  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on curriculum designs, instructional models, and authentic assessment techniques for developing social studies knowledge, citizenship, and critical thinking skills; emphasis is on best practice and research-based strategies for teaching secondary students. Field experiences required.  
*Prerequisites: Admission to Teacher Education Program.*

TCED 5235 Science Methods for the Secondary Grades  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on strategies for teaching secondary science, including safety; emphasis is on recent research as it relates to science education; addresses issues and trends in secondary science education and enhancing science achievement in the classroom. Field experiences required.  
*Prerequisites: Admission to Teacher Education Program.*

TCED 5236 Mathematics Methods for the Secondary Grades  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on curriculum designs, instructional models, and authentic assessment techniques for developing mathematical knowledge and problem-solving skills; emphasis is on best practice and research-based strategies for teaching mathematics to secondary students. Field experiences required.  
*Prerequisites: Admission to Teacher Education Program.*
TCED 5330 Fostering Critical Inquiry: Introduction to Action Research  
Credit: 3 | Lecture: 3 | Lab: 0  
Engage in inquiry to define and investigate a classroom issue of interest. Investigate structured action research as a tool to foster improvement of classroom practice.  
*Prerequisites: EDUC 6033*

TCED 5331 Social Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Explore critical and controversial issues in contemporary education and determine how these issues impact students, teachers, and the K-12 education system. Themes of the course will include social justice, multiculturalism, community, and 21st century critical dispositions and skills.

TCED 5332 Teaching Science in the 4-8 Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
This course discusses the development of science concepts and teaching strategies for grades 4-8. Emphasis is on the inquiry approach to teaching science consistent with concepts of cognitive development. Field experiences required.  
*Prerequisites: Admission to Teacher Education Program.*

TCED 5333 Teaching Mathematics in the 4-8 Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on the development of mathematical concepts and teaching strategies for grades 4-8. Emphasis is on problem solving with manipulative and curriculum materials appropriate for use with fourth to eighth grade students. Algebraic and graphing technology will be addressed. Field experiences required.  
*Prerequisites: MATH 3037 and Admission to Teacher Education Program.*

TCED 5334 Teaching Social Studies in the 4-8 Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
This course focuses on curricula designs, instructional models, and authentic assessment techniques for developing social studies knowledge, citizenship, and critical thinking skills; emphasis is on best practice and research-based strategies for teaching 4-8 students. Field experiences required.  
*Prerequisites: Admission to Teacher Preparation Program.*

TCED 5338 Strategies for Publishing Instructional Products  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will focus on strategies, techniques, and guidelines useful for getting teaching ideas, stories, and innovative curriculum products published.  
*Prerequisites: MATH 3037 and Admission to Teacher Education Program.*
TCED 5431 Nature of the Middle Level Learner  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a developmental approach to the study of early adolescents with emphasis on their physical, emotional, intellectual, and moral development; learning styles; cultural related differences and discipline management techniques. Field experiences is required for students seeking teacher certification.

TCED 5530 Adolescent Development and Curriculum  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a developmental approach to the study of adolescents related to discipline, classroom management, and scope and sequence of curriculum. Field experience is required for students seeking teacher certification.

TCED 5911 Research Topics in Teacher Education  
Credit: 1 | Lecture: 1 | Lab: 0  
Identified by specific title each time course is offered.

TCED 5921 Research Topics in Teacher Education  
Credit: 2 | Lecture: 2 | Lab: 0  
Identified by specific title each time course is offered.

TCED 5931 Research Topics in Teacher Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

TCED 5939 Independent Study in Teacher Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

TCED 6031 Application of Technology in the Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will learn how to use and integrate computers and various software applications (e.g., word processors, databases, spreadsheets and graphics) with instruction to facilitate learning and performance. They will also be instructed in the use of educational software, multimedia development, and telecommunication technologies such as e-mail and the Internet that can be used to enhance student learning.

Prerequisites: Basic computer literacy.

TCED 6639 Capstone Project  
Credit: 3 | Lecture: 3 | Lab: 0  
This course serves as a capstone experience for candidates in the C&I master's degree program in specialization tracks that are conducted online. The capstone experience results in a product created that aligns with professional standards of the specialization.

TCED 6734 Advanced Seminar in Science Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This seminar covers advanced topics on research in science education; emphasis is on instructional techniques and concept formation.
TCED 6735 Seminar in Environmental Education
Credit: 3 | Lecture: 3 | Lab: 0
This seminar will discuss the skills needed to address environmental issues including strategies for investigating environmental issues at local, state, regional, or national levels; and selecting and implementing actions to resolve issues through political, economic, legal, educational, and lifestyle avenues. Other topics include questioning, analysis, and interpretation skills and knowledge of environmental processes and systems.

TCED 6736 Fundamentals in Environmental Education
Credit: 3 | Lecture: 3 | Lab: 0
This course will focus on the conceptual and philosophical basis for and goals of environmental education. In addition, students will examine the environmental education theory, practice and implementation along with the professional responsibilities of the environmental educator.

TCED 6737 History and Philosophy of Environmental Education
Credit: 3 | Lecture: 3 | Lab: 0
The course will focus on the history, philosophy, practices, methods, and issues of environmental education. In addition, students will examine the evolution of environmental education as a profession.

TCED 6738 Instructional Strategies in Environmental Education
Credit: 3 | Lecture: 3 | Lab: 0
The course will address the fundamentals of high-quality education and the unique features of environmental education to design and implement effective instruction. Topics include strategies for teaching about the environment using effective methodologies; develop, apply and evaluate environmental education curriculum materials and resources including technologies to assist learning and planning for both the formal and non-formal settings.

TCED 6739 Curriculum and Instruction Practicum
Credit: 3 | Lecture: 3 | Lab: 0
Supervised internship in curriculum and instruction.
Prerequisites: Approval of the associate dean.

TCED 6769 Clinical Teaching
Credit: 3 | Lecture: 3 | Lab: 0
This course is designed for students earning teacher certification. Current practitioners will engage in an action research inquiry to investigate a pedagogical issue within their own teaching. Candidates earning their teaching certification will have the opportunity to teach in the public schools as part of the state requirements with intensive, sustained supervision and support.
Prerequisites: Enrollment in MAT program.
WGST Women’s and Gender Studies

WGST 5337 Violence Against Women
Credit: 3 | Lecture: 3 | Lab: 0
Global perspectives of violence against women by men. Topics include rape, sexual abuse, incest, female genital mutilation, battering, sexual slavery, and sexual harassment.

WGST 5438 Development of Gender and Racial Identity
Credit: 3 | Lecture: 3 | Lab: 0
Examination of theoretical approaches to the study of gender and racial/ethnic identity development.

WGST 5533 Psychology of Gender, Race, and Sexuality
Credit: 3 | Lecture: 3 | Lab: 0
Topics include sex roles, stereotyping, socialization of women and men, feminism, female sexuality, feminist therapy, androgyny, and the situation of minority women.

WGST 5732 Seminar in Women's and Gender Studies
Credit: 3 | Lecture: 3 | Lab: 0
An advanced course in Women’s and Gender Studies. Analysis and application of feminist theory across multiple disciplines.
Prerequisites: Any previous course with Women's and Gender Studies content.

WGST 5931 Research Topics in Women's and Gender Studies
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered. Topics vary; may be repeated for credit with permission of instructor.

WGST 5939 Independent Study in Women's Studies
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

WRIT Writing

WRIT 5130 Composition Theory
Credit: 3 | Lecture: 3 | Lab: 0
Introduces graduate students to the current research, theory, and pedagogical approaches that inform the teaching of writing. The overall goal of this course is to provide students with a solid background in composition theory and practice on which to build a lifetime of exploration of this extremely important subject.

WRIT 5131 Writing Pedagogy
Credit: 3 | Lecture: 3 | Lab: 0
Provides a practical guide to teaching writing courses in community college and university settings. Topics can include teaching on-line, working with special populations such as developmental writers or non-native speakers. Topics vary; may be repeated for credit with permission of instructor.

WRIT 5132 Seminar in Rhetorical Theories I
Credit: 3 | Lecture: 3 | Lab: 0
Provides an overview of some of the primary scholarship that has affected the study of global rhetoric from antiquity through the late 18th century.
WRIT 5133 Seminar in Rhetorical Theories II  
Credit: 3 | Lecture: 3 | Lab: 0  
Provides an overview of critical texts that explain global theories and methodologies pertaining to the field of contemporary rhetorical studies from the late 18th to the 21st centuries, includes studies of race, gender, disability, new media, and embodiment. **Prerequisites:** WRIT 5132.

WRIT 5134 Special Topics in Discourse Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Writing-intensive seminar, investigating a special issue or topic in the study of discourse, literacy, and disciplinary communication as selected by the instructor. Topics vary; may be repeated for credit with permission of instructor.

WRIT 5135 Special Topics in Linguistics  
Credit: 3 | Lecture: 3 | Lab: 0  
Graduate seminar investigating a special topic in the study of language, linguistics, and psychosocial communication. Topics vary; may be repeated for credit with permission of instructor.

WRIT 5136 Writing for Graduate School  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduces graduate students to the rhetorical and stylistic aspect of graduate-level texts in their disciplines. Students will study and practice writing the types of texts required in these fields. **Prerequisites:** WRIT 1301 and WRIT 1302 with a C- or better. Junior-level writing course with a B or better and a writing sample.

WRIT 5137 Grant and Proposal Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Project-based course covers the complete process of grant proposal development from project identification, research and assessment of viable funding sources, budget development, and proposal preparation to post-award or rejection follow-up.

WRIT 5138 Multimedia Composition and Theory  
Credit: 3 | Lecture: 3 | Lab: 0  
In-depth study of the theory and methods for composing multimedia texts, combining text, audio, video, and images. Students will design and produce texts and publish in e-portfolios.

WRIT 5139 Digital Rhetoric  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores the dynamics of on-line, networked reading and writing practices. Encourages critical thinking about how technology informs rhetorical theory and shapes praxis with attention given to the ways individuals, teams, businesses, and organizations construct and distribute knowledge in electronic spaces.

WRIT 5230 Collaborative Writing Pedagogy  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduces students to the theories and practices that inform collaborative pedagogy. Students will learn theories of collaboration, practice methods for one-on-one and small group conferencing, learn research skills, understand formatting styles for different academic disciplines, and practice the interpersonal skills necessary for working with a diverse student population. **Prerequisites:** WRIT 1301 and WRIT 1302 with a C- or better. Junior-level writing course with a B or better and a writing sample.

WRIT 5931 Research Topics in Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific topic each time the course is offered. Topics vary; may be repeated for credit with permission of instructor.

WRIT 5939 Independent Study in Writing  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of adviser and instructor required.
WRIT 6739 Internship
Credit: 3 | Lecture: 0 | Lab: 0
Supervised three-unit internship in approved internship setting. Comprehensive written report required.

Prerequisites: Students must have completed at least 15 units of graduate-level courses in the WRIT rubric.