Course Roster

ACCT Accounting

ACCT 2301 Principles of Accounting I – Financial
Credit: 3 | Lecture: 3
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 2302 Principles of Accounting II – Managerial
Credit: 3 | Lecture: 3
Accounting concepts and their application to cost behavior, budgeting, responsibility accounting, cost control and product costing. 
Prerequisites: ACCT 2301

ACCT 3331 Managerial Accounting
Credit: 3 | Lecture: 3
Analysis of cost systems and preparation of cost statements. Management use of cost statements for control and financial reporting. Cannot be taken for credit by accounting majors. 
Prerequisites: Six semester hours of Principles of Accounting or equivalent.

ACCT 3332 Financial Reporting and Analysis
Credit: 3 | Lecture: 3
Intermediate accounting concepts and procedures for financial reporting and analysis. Cannot be taken for credit by accounting majors. 
Prerequisites: Six semester hours of Principles of Accounting or equivalent.

ACCT 3333 Cost Accounting
Credit: 3 | Lecture: 3
Intensive examination of cost systems, cost behavior, approaches to cost statements, implications for managerial planning and financial reporting.
Prerequisites: Six semester hours of Principles of Accounting or equivalent.

ACCT 3341 Intermediate Accounting I
Credit: 3 | Lecture: 3
Study of the concepts and procedures underlying the measurement and reporting of financial information.
Prerequisites: Six semester hours of Principles of Accounting or equivalent.

ACCT 3342 Intermediate Accounting II
Credit: 3 | Lecture: 3
Continuation of the study of concepts and procedures underlying the measurement and reporting of financial information.
Prerequisites: ACCT 3341 or equivalent.

ACCT 4331 Federal Taxation of Individuals
Credit: 3 | Lecture: 3
An analysis of the federal income tax laws as they apply to individuals. 
Prerequisites: Six semester hours of Principles of Accounting or equivalent.

ACCT 4332 Financial Information Systems
Credit: 3 | Lecture: 3
Design and operation of contemporary accounting information systems, including control concepts and reporting responsibilities. 
Prerequisites: ACCT 3341 and ISAM 3303 or equivalent.
ACCT 4336 Principles of Auditing  
Credit: 3 | Lecture: 3  
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.  
Prerequisites: ACCT 3342 or equivalent

ACCT 4337 Business Valuation  
Credit: 3 | Lecture: 3  
Business valuation teaches the concepts and techniques in using accounting and financial information to determine the value of a business enterprise or ownership interest. The course will cover the theories and standards in business valuation, analysis of financial statements to estimate future income, the commonly used methods of business valuation, such as the income approach, market approach, and assets approach, and the calculation of discount rates. Through this course, students will acquire the basic skills and complete hands-on exercises in valuing closely held businesses and equity investments.  
Prerequisites: ACCT 3342 or equivalent

ACCT 4341 Auditing I  
Credit: 3 | Lecture: 3  
An introduction to auditing theory and standards, with emphasis on the attest function, professional ethics and responsibilities, audit risk concepts and audit planning.  
Prerequisites: ACCT 3342 or equivalent  
Corequisites: ACCT 4332 or equivalent

ACCT 4342 Government and Not-for-Profit Accounting  
Credit: 3 | Lecture: 3  
The course covers the government and not-for-profit environment, fund accounting, budgeting, revenue and expenditure recognition, and financial reporting requirements.  
Prerequisites: ACCT 3342 or equivalent.

ACCT 4344 Oil and Gas Accounting  
Credit: 3 | Lecture: 3  
Exploration and production activities of a petroleum company are examined from both a financial and tax accounting standpoint.  
Prerequisites: ACCT 3341 or equivalent.

ACCT 4345 Software Applications in Auditing  
Credit: 3 | Lecture: 3  
This course is designed to provide the student with a solid foundation in using various software tools to improve and enhance the audit of financial statements. Students will learn about and have practical experience with manipulating raw data to unlock the useful audit information contained in the raw data. The course will use the tools to perform data extraction, analysis, and sampling. The course will also briefly cover using the tools for fraud detection and prevention.  
Prerequisites: ACCT 3341 and ISAM 3303 or equivalents.  
Corequisites: ACCT 4332
ACCT 4346 Business Ethics for Accountants  
Credit: 3 | Lecture: 3  
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, or equivalents.

ACCT 4348 Introduction to Data Analytics in Accounting  
Credit: 3 | Lecture: 3 | Lab: 1  
This course provides students with an introduction to 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.  
Prerequisites: ACCT 2301 or equivalent, DSCI 3321 or equivalent, ISAM 3303 or equivalent,

ACCT 4352 Advanced Financial Accounting  
Credit: 3 | Lecture: 3  
Accounting for the acquisition and consolidation of domestic and foreign concerns, foreign currency translations and re-measurement; accounting for branches, governmental agencies and other not-for-profit entities.  
Prerequisites: ACCT 3342 or equivalent.

ACCT 4353 Federal Taxation of Business Entities  
Credit: 3 | Lecture: 3  
This course is designed to provide a broad overview of entity taxation and the link between the accounting information reported for financial statement purposes and the information reported on business tax returns. It addresses the income tax laws governing the taxation of corporations, partnerships, limited liability companies, limited liability partnerships, and S corporations.  
Prerequisites: ACCT 4331 or equivalent.

ACCT 4361 International Accounting  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of international accounting issues from a managerial accounting and financial reporting perspective. This course addresses the current status of the international financial reporting standards (IFRS) and the challenges facing users of multinational enterprise’s financial information when it is prepared using IFRS or other national financial reporting regimes.  
Prerequisites: ACCT 3341 or equivalent.
ACCT 4379 Internship in Accounting  
Credit: 3 | Lecture: 3  
Supervised work experiences each week in an approved accounting firm, governmental agency, or business. Written work as required by sponsoring faculty member.  
Prerequisites: 15 hours of upper-level credit, approval of associate dean and faculty chair, and sponsoring faculty member.

ACCT 4389 Independent Studies in Accounting  
Credit: 3 | Lecture: 3  
Independent directed study in Accounting.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

ACCT 4391 Selected Topics in Accounting  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

ACCT 5234 Corporate and Pass Through Entity Taxation  
Credit: 3 | Lecture: 0 | Lab: 1  
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 5231 or equivalent.

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 3034 or ISAM 5030, or 6 hours of college-level 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 5333 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. (Cross-listed 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  
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 Govt & Not Profit  
Credit: 3 | Lecture: 3  
The course covers the government and not-for-profit environment, fund accounting, budgeting, revenue and expenditure recognition, financial reporting requirements, and current issues.  
Prerequisites: ACCT 5134 or equivalent

ACCT 5438 Fundamentals of Data Analytics in Accounting  
Credit: 3 | Lecture: 3 | Lab: 0  
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 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.

ANTH Anthropology

ANTH 2346 General Anthropology
Credit: 3 | Lecture: 3 | Lab: 0
Study of human beings, their antecedents and related primates, and their cultural behavior and institutions. Introduces the major subfields: physical and cultural anthropology, archeology, linguistics, and ethnology.

ANTH 3311 Contemporary Cultural Anthropology
Credit: 3 | Lecture: 3 | Lab: 0
The comparative study of culture as manifested in technology, language, personality, and religion and in the social, economic, and political organization of societies.

ANTH 3330 Interdisciplinary Perspectives in Global Health
Credit: 3 | Lecture: 3 | Lab: 0
Explores major health challenges in the world today and efforts to address them. Topics include health care systems, armed conflicts and emergencies, and major global initiatives for disease prevention and health promotion.

ANTH 3334 Human Sex, Culture, Health
Credit: 3 | Lecture: 3 | Lab: 0
Explores cultural and biological dimensions of human sexuality from a cross-cultural perspective; examines how cultures mediate sexually transmitted disease, reproductive health, and gender roles, among other issues.

ANTH 3352 Political/Economic Anthropology
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the methods and theories used by anthropologists to understand political and economic systems in traditional and developing societies.

ANTH 3355 Topics in Asian Studies
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of social and cultural diversity. Focuses on religion, economy, politics, and social structure. Topics vary; may be repeated for credit with permission of instructor.

ANTH 3357 Topics in African Studies
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of cultural diversity of African societies and the African diaspora. Topics vary; may be repeated for credit with permission of instructor.

ANTH 3358 Topics in Middle Eastern Societies
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of the social and cultural diversity of peoples of the Middle Eastern societies. Focuses on religion, economy, politics, and social structure. Topics vary; may be repeated for credit with permission of instructor.
ANTH 3359 Gender, Media, and Diplomacy in the Arab World  
**Credit: 3 | Lecture: 3 | Lab: 0**  
The course looks at U.S. and international policy and its relationship to diplomacy in the Arab World. Students look at the Arab world as it has developed since the dissolution of the Ottoman Empire. This class examines the connections between media production, gender, and nation state identity.

ANTH 3360 Islam in Africa  
**Credit: 3 | Lecture: 3 | Lab: 0**  
The course focuses on the growth of Islam in Africa, looking carefully at the ways that different regions of the continent have been home to highly varied Muslim communities.

ANTH 3361 Anthropology of Food  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Exploration of production, consumption, and distribution of food in the United States and internationally.

ANTH 3362 Medicine, Bodies, and Culture  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Study of the relationships among illness, health, healing systems, the human body, bodily practices, and broader systems of social power through lecture, discussion, films and projects.

ANTH 4301 Studies in Cultural Diversity  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Critical examination of cultural diversity as expressed in formations of ethnicity, race, class, nationalism, and gender. Topics vary; may be repeated for credit with permission of instructor.

ANTH 4302 Applied Anthropology  
**Credit: 3 | Lecture: 0 | Lab: 0**  
Explores application of anthropological insights and methods to address practical issues and public policy. It employs essential tools that can be used in many applied settings including governmental organizations, non-profits, and the private sectors.

ANTH 4303 Islam in America  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Explores various communities of Muslims from the American colonial period to the present with an emphasis on ethnic groups in different regions of the U.S.

ANTH 4304 The Arab Gulf: Culture, Economy, Modernity  
**Credit: 3 | Lecture: 3 | Lab: 0**  
The course explores the unique cultures of the Arab Gulf region in historical, contemporary, and diplomatic perspectives.

ANTH 4306 Service Learning  
**Credit: 3 | Lecture: 3 | Lab: 0**  
Service Learning is a course designed for students to take an active part in organized experiences that meet actual community needs combined with academic instruction, focusing on critical, reflective thinking and personal and civic responsibility. This course will involve students in activities that address community-identified needs with service integrating academic skills.
ANTH 4330 Cultural Study Abroad  
Credit: 3 | Lecture: 3 | Lab: 0  
Course exposes students to culture, history, religion, and politics of another country. Involves foreign travel and includes a prerequisite of semester-long course focusing on the study-abroad country. Permission of instructor required.

ANTH 4333 Peoples of Mexico and Central America  
Credit: 3 | Lecture: 3 | Lab: 0  
A survey of anthropological approaches to the regions of Mexico, Central America, and U.S.-Mexico border. Particular attention paid to gender and women's issues as well as race and class.

ANTH 4334 Native Americans  
Credit: 3 | Lecture: 3 | Lab: 0  
An examination of the social and cultural diversity of indigenous peoples of North America from anthropological and historical perspectives.

ANTH 4341 Gender and Sexuality in Global Perspectives  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores the many ways gender and sexuality are constructed cross-culturally. Compares the way different societies conceptualize each gender and assign them social, economic, and political significance.

ANTH 4342 Human Rights, Social Justice, Health  
Credit: 3 | Lecture: 3 | Lab: 0  
Critical examination of human rights in the contemporary period with a focus on their connection to health and well-being.

ANTH 4343 Anthropological Perspectives on World Religion  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis of the ways religion is lived and practiced in diverse communities in the world.

ANTH 4351 Families, Communities, and Globalization  
Credit: 3 | Lecture: 3 | Lab: 0  
An examination of ideas of family, race, gender, and relatedness in transnational and cross-cultural perspectives. Draws on case studies and theories from anthropology and other fields.

ANTH 4352 World Prehistory and Archaeology  
Credit: 3 | Lecture: 3 | Lab: 0  
An examination of the basic methods and theories used by archaeologists to explore human evolution and prehistory.

ANTH 4364 Visual Anthropology  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of anthropology through visual media, specifically film and still photography.

ANTH 4372 Applied Qualitative Methods  
Credit: 3 | Lecture: 0 | Lab: 3  
Skill-building course focused on different methods, protocols, and techniques of qualitative research practices as applicable in social science studies and beyond.

ANTH 4389 Independent Study in Anthropology  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

ANTH 4391 Selected 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.
ARTS Art and Design

ARTS 1303 World Art Survey I
Credit: 3 | Lecture: 3 | Lab: 0
Examination of painting, sculpture, architecture, and other arts from prehistoric to Renaissance periods.

ARTS 1304 World Art Survey II
Credit: 3 | Lecture: 3 | Lab: 0
Examination of painting, sculpture, architecture, and other arts from the post-Renaissance to the contemporary period.

ARTS 1311 Design Foundations
Credit: 3 | Lecture: 0 | Lab: 3
An exploration of the elements and principles of art within the context of two-dimensional design. Assignments will utilize various media to investigate concepts introduced in lectures and readings. Focus on terminology will enable students to speak and communicate knowledgeably about their work.

ARTS 1314 Dance Appreciation
Credit: 3 | Lecture: 3 | Lab: 0
Dance Appreciation provides an introduction to dance including its cultural, social, and artistic aspects. This course examines Dance as a primary mode of human expression and communication with emphasis on historical perspectives observation and analysis of live and video performance and exploration/analysis of creative and expressive experiences.

ARTS 1316 Drawing Foundations
Credit: 3 | Lecture: 0 | Lab: 3
Introduces an array of materials and techniques fundamental to the practice of drawing. Through observational studies, students will develop a technical and conceptual understanding of this expressive medium.

ARTS 1325 Drawing for Non-Art Majors
Credit: 3 | Lecture: 0 | Lab: 3
Exploration of drawing media, composition, and space relationships using recognizable forms.

ARTS 1371 Photography for Non-Art Majors
Credit: 3 | Lecture: 0 | Lab: 3
Exploration of basic methods and processes of the photographic medium. Topics include use of camera and techniques for taking better photographs.

ARTS 2316 Painting
Credit: 3 | Lecture: 0 | Lab: 3
An introduction to the materials and techniques fundamental to the discipline of painting. Through observational studies, students will develop a technical and conceptual understanding of this expressive medium. Prerequisites: ARTS 1316

ARTS 2371 Digital Photography
Credit: 3 | Lecture: 3 | Lab: 0
ARTS 2379 Arts and the Child  
Credit: 3 | Lecture: 3 | Lab: 1  
Prepares individuals to teach three art forms—visual art, music, theater—to young children through elementary ages.

ARTS 3310 Sculpture  
Credit: 3 | Lecture: 0 | Lab: 3  
A study of three-dimensional forms as related to techniques, processes, aesthetics, and other materials.

ARTS 3320 Ceramics  
Credit: 3 | Lecture: 0 | Lab: 3  
Introduction to basic ceramic approaches, materials, and processes including wheel throwing, hand-building, glazing, and kiln firing. Examines contemporary and historical approaches to ceramics focusing on the vessel and sculptural objects.

ARTS 3331 Intermediate Drawing  
Credit: 3 | Lecture: 0 | Lab: 3  
Expands upon the methods and techniques introduced in beginning drawing courses. Studio assignments will encourage students to relate conceptual ideas with their technical skills while exploring a range of drawing media.  
Prerequisites: ARTS 1316 or permission of instructor.

ARTS 3333 Life Drawing  
Credit: 3 | Lecture: 0 | Lab: 3  
Introduction to techniques of proportion and accuracy in drawing the human form starting from the skeleton and progressing to a live model. Students work in pencil, pastel, and charcoal in both detailed and gesture drawings. Topics vary; may be repeated for credit with permission of instructor.  
Prerequisites: ARTS 1316

ARTS 3335 Intermediate Painting  
Credit: 3 | Lecture: 0 | Lab: 3  
This course expands upon the methods and techniques introduced in beginning painting courses. Studio assignments will encourage students to relate conceptual ideas with their technical skills while exploring a range of painting media.  
Prerequisites: ARTS 2316 or permission of instructor.

ARTS 3340 Printmaking  
Credit: 3 | Lecture: 0 | Lab: 6  
An exploration of the processes involved in a variety of printmaking media, including color linocut, copper etching, and monotype. Other techniques that may also be covered include woodcut, collagraph, and/or book arts.  
Prerequisites: ARTS 1316 or equivalent.

ARTS 3341 Fibers  
Credit: 3 | Lecture: 0 | Lab: 3  
History, design, and techniques of woven and non-woven fiber forms.

ARTS 3350 Art 1900–1950  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. Examines the art of Europe, the United States, and Latin America in the first half of the twentieth century. Topics include the birth and growth of modernism, the impact of the World Wars on the artistic communities of the regions studied, and major movements such as Cubism, Dadaism, Fauvism, Impressionism, and Surrealism. (Cross-listed with HUMN 3350.)
ARTS 3351 Art 1950–Present
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Examines the art of Europe, the United States, and Latin America in the first half of the twentieth century. Topics include art in the aftermath of World War II, conceptualism, performance art, video art, feminist art, and the contemporary art market. (Cross-listed with HUMN 3351.)

ARTS 3352 Traditional Photography
Credit: 3 | Lecture: 3 | Lab: 1
Exploration of methods, processes, and craft of film based on photography. Techniques includes chemical development of photographic film and paper.

ARTS 3355 Latin American Art of the Twentieth Century
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Examine the art of 20th century Latin America through a series of major modern art centers, including Mexico City, Havana, Buenos Aires, Rio de Janeiro, Bogota, and Caracas. (Cross–listed with HUMN 3355.)

ARTS 3356 Mexican Art, 1500–Present
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Explore the history of visual art in Mexico, beginning with the period of encounter between native populations of that region of the Americas and the European explorers who arrived in the Americas in the late 15th century and continuing through the colonial, independence, and modern eras. (Cross–listed with HUMN 3356.)

ARTS 3357 History and Theory of Photography
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Study of history and function of photography from its development in the fine arts to present–day significance of mechanical and digital reproduction. (Cross–listed with HUMN 3357.)

ARTS 3360 Graphic Design
Credit: 3 | Lecture: 3 | Lab: 0
Overview of practices of graphic design. Presentations on contemporary design techniques. Design projects in vector drawing using Adobe Illustrator. Previous skills in art, design, and computer software desirable.

ARTS 3369 Illustration
Credit: 3 | Lecture: 0 | Lab: 3
As an introduction to illustration, this course examines different working methods to develop content driven imagery. Assignments will use traditional illustration skills to provide exposure to various materials including pen and ink, acrylic, gouache and experimental media.

ARTS 4189 Independent Study in Art
Credit: 1 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 1 hour of credit. For 2 or 3 credit hours of Independent Study credit, students should enroll in ARTS 4289 or ARTS 4389.

ARTS 4289 Independent Study in Art
Credit: 2 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 2 hour of credit. For 1 or 3 credit hours of Independent Study credit, students should enroll in ARTS 4189 or ARTS 4389.
ARTS 4300 Methods in Elementary Art Education  
Credit: 3 | Lecture: 3 | Lab: 1  
Examination of EC-6 standards, research, and trends in theory and practice. Curriculum, instructional techniques, and classroom management are fully addressed. TBA practicum required. Permission of instructor required.

ARTS 4301 Methods in Secondary Art Education  
Credit: 3 | Lecture: 3 | Lab: 1  
Examination of 7–12 standards, research and trends in theory and practice. Curriculum instructional techniques, and classroom management are fully addressed. TBA practicum required. Permission of instructor required.

ARTS 4302 Crafts Design  
Credit: 3 | Lecture: 0 | Lab: 3  
Study of crafts history, design, and techniques. Projects may include paper making, fibers, clay, printmaking, bookmaking, assemblage, and/or other media. May be repeated for credit. This course is studio-focused and does not qualify as an art history elective.

ARTS 4310 Advanced Sculpture  
Credit: 3 | Lecture: 0 | Lab: 6  
Allows students to develop advanced processes in sculpture. Topics may vary (Lost-Wax Bronze Foundry, Public Sculpture, etc.). May be repeated for credit.  
*Prerequisites: ARTS 3310*

ARTS 4311 Process Sculpture  
Credit: 3 | Lecture: 0 | Lab: 3  
Study of 3-Dimensional forms through wood and metal fabrication. May be repeated for credit.  
*Prerequisites: ARTS 3310*

ARTS 4312 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 HUMN 4312.)

ARTS 4315 Art of the Ancient Greek World  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. The art, history, and culture of the ancient Greek world from the Bronze Age through the Hellenistic period. Topics include appropriation, cultural heritage, and gender studies. (Cross-listed with HUMN 4315.)

ARTS 4320 Advanced Ceramics  
Credit: 3 | Lecture: 0 | Lab: 3  
Emphasis on individual projects and personal growth through technique and concept. Focused investigation and application of ceramic materials, approaches, and processes including wheel-throwing, hand-building, mold making, glazing, and kiln firing. May be repeated for credit.

ARTS 4322 Roman Art  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. 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. (Cross-listed with HUMN 4322.)
ARTS 4331 Advanced Drawing
Credit: 3 | Lecture: 0 | Lab: 3
This course encourages students to pursue individual approaches and explore drawing as an independent discipline. Through studio drawing practices and integration with the study of theory, students will develop a personal sense of imagery. May be repeated for credit with permission of instructor.
Prerequisites: ARTS 3331 or equivalent.

ARTS 4332 Advanced Life Drawing
Credit: 3 | Lecture: 0 | Lab: 3
Advanced techniques of proportion and accuracy in drawing the human form. Students continue to work from live model in pencil, paste, and charcoal in both detailed and gesture drawings. Topics vary; may be repeated for credit with permission of instructor.
Prerequisites: ARTS 3331 or ARTS 3333

ARTS 4335 Advanced Painting
Credit: 3 | Lecture: 0 | Lab: 3
This course encourages students to pursue individual approaches and explore painting as an independent discipline. Through studio painting practices and integration with the study of theory, students will develop a personal sense of imagery. May be repeated for credit.
Prerequisites: ARTS 3335

ARTS 4339 Silkscreen Printing
Credit: 3 | Lecture: 0 | Lab: 3
Printmaking course focusing specifically on the technique of silkscreen. Students will learn various ways to create imagery with silkscreen, including the use of screen-filter stencils, hand-drawn stencils, and digital/photo-based stencils. May be repeated for credit.
Prerequisites: ARTS 1316 or ARTS 1325

ARTS 4340 Advanced Printmaking
Credit: 3 | Lecture: 0 | Lab: 6
A continuing study of printmaking processes learned in ARTS 3340 or in ARTS 4339. This can include exploration in either linocut, woodcut, etching, silkscreen, monotype, lithography, or a combination. Students will be encouraged to develop conceptual ideas in addition to refining their skills.
Prerequisites: ARTS 3340, ARTS 4339, or equivalent.

ARTS 4341 Advanced Fibers
Credit: 3 | Lecture: 0 | Lab: 3
Supervised projects in woven and non-woven techniques with emphasis on color and design. May be repeated for credit.
Prerequisites: ARTS 3341.

ARTS 4348 Information Design
Credit: 3 | Lecture: 3 | Lab: 0
Exploration and design of infographics from a variety of data, statistics, and informational sources. Course lectures include visual translation, visual problem-solving, and overviews of professional infographics. Topics vary.
Prerequisites: ARTS 2371 and ARTS 3360

ARTS 4350 Advanced Traditional Photography
Credit: 3 | Lecture: 0 | Lab: 6
Further exploration of traditional photography as an artistic medium. Emphasis on craft, concept, and alternative print processes. Topics vary; may be repeated for credit.
Prerequisites: ARTS 3352 or equivalent with instructor approval.
ARTS 4351 Advanced Digital Photography
Credit: 3 | Lecture: 3 | Lab: 0
Emphasis on Photoshop and post-camera processes. Collage work includes Digital Matte Painting and Advanced Photoshop Effects. Access to a DSLR camera required. Topics vary; may be repeated for credit.
Prerequisites: ARTS 2371 or permission of instructor.

ARTS 4352 Video Arts
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of various methods and processes of video production using non-linear editing equipment. Emphasizes concept development, experimentation, and artistic expression. A working knowledge of video cameras and basic editing skills is helpful.
Prerequisites: ARTS 2371

ARTS 4353 Portrait Photography
Credit: 3 | Lecture: 0 | Lab: 3
Studio exploration of photographic portraiture. Investigation of natural and studio lighting, as well as poses, and digital retouching. Projects vary; may be repeated for credit with permission of instructor. Experience with a Digital Camera and manipulation practices required.

ARTS 4358 History and Theory of Graphic Design
Credit: 3 | Lecture: 3 | Lab: 0
History of graphic design from the inception of written communication to postmodern design and digital revolution.
Prerequisites: ARTS 1303 or ARTS 1304 or permission of instructor.

ARTS 4363 Advertising Design
Credit: 3 | Lecture: 3 | Lab: 0
Survey of image techniques used in the field of advertising. Design projects requiring various computer techniques. Previously established design skills are required.
Prerequisites: ARTS 2371 and ARTS 3360 or permission of instructor.

ARTS 4364 Museum Studies
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Introduces students to the theory and operations of fine arts museums, including strategies of display, collection management, accessions, and public relations. The course will include visits to local gallery and museum spaces. (Cross-listed with HUMN 4364.)

ARTS 4366 Propaganda and Persuasive Images
Credit: 3 | Lecture: 3 | Lab: 0
Art History. Examines the theory and use of propagandistic and persuasive imagery with particular focus on the twentieth century. The propaganda of World War II will comprise a major unit, as well as a study of modern photo manipulation and advertising strategies.

ARTS 4368 Graphic Novel Design
Credit: 3 | Lecture: 3 | Lab: 0
Write, create, and produce original graphic novels. Techniques include both on- and off-computer skills, scripting, character design, and motion studies. Professional examples will be discussed.
Prerequisites: ARTS 3333 and ARTS 3360 or similar with permission of instructor.
ARTS 4369 Digital Illustration  
Credit: 3 | Lecture: 3 | Lab: 0  
Design projects using various techniques including Adobe software, typography, and photo-illustration. Assignments emphasize concept, creativity, communication, technical achievement, and presentation. Topics vary; may be repeated for credit.  
Prerequisites: ARTS 3360 and ARTS 2371, or similar with permission of instructor.

ARTS 4374 Modern Art  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. Modernity, modernism, fantasy, enigma in early 20th-century European and American art and architecture by such masters as Picasso, Matisse, Kandinsky, Mondrian, Duchamp, Dali, Magritte, Kahlo, Brancusi, Frank Lloyd Wright, Le Corbusier, and O’Keeffe.

ARTS 4377 Topics in Contemporary Art  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. Concentrated study in single topic pertaining to contemporary art (post-WW2 period). Topics vary; may be repeated for credit with permission of instructor.

ARTS 4384 Museum Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. An examination of museum pedagogy. Topics include tour techniques, public programming, museum-school services, object-based learning, and the development of educational materials. Includes lectures, field trips, and individual projects.

ARTS 4389 Independent Study in Art  
Credit: 3 | Lecture: 0 | Lab: 0  
Personal projects in Art. Enrollment requires a written proposal. Permission of instructor required. May be taken for 3 hours of credit.

ARTS 4390 Senior Seminar in Art  
Credit: 3 | Lecture: 3 | Lab: 1  
Required capstone course for Arts majors. Prepares students for graduate and professional engagement from several theoretical and practical perspectives.

ARTS 4391 Selected Topics in Art  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific subtitle each time course is offered. Read topic description for more details. Topics vary; may be repeated for credit with permission of instructor.

ARTS 4392 Arts Internship  
Credit: 3 | Lecture: 0 | Lab: 0  
Supervised on-site internship in art or design capacity. Permission of instructor required.

ASTR Astronomy and Space Science

ASTR 1103 Laboratory for Stars and Galaxies  
Credit: 1 | Lecture: 0 | Lab: 3  
Laboratory experiments and activities in stellar and galactic astronomy.  
Corequisites: ASTR 1303

ASTR 1104 Laboratory for Solar System  
Credit: 1 | Lecture: 0 | Lab: 3  
Laboratory experiments and activities in observational and solar system astronomy.  
Corequisites: ASTR 1304
ASTR 1303 Stars and Galaxies  
Credit: 3 | Lecture: 3  
Part of a two-semester survey course in astronomy intended for both science and non-science majors. Properties of the sun and stars, stellar spectra, stellar formation, life and death of stars, formation of the elements, black holes, galaxies, expansion of the universe and cosmology. Laboratory experiments and activities in stellar and galactic astronomy.

ASTR 1304 Solar System  
Credit: 3 | Lecture: 3  
Part of a two-semester survey course in astronomy intended for both science and non-science majors. History of astronomy, Copernican revolution, astronomical observation, physics of planetary motion, comparative study of planet surfaces and atmospheres, moons, asteroids, comets, planetary system formation and exoplanets.

ASTR 2377 Life and the Universe  
Credit: 3 | Lecture: 3  
Origin of the Universe, origin and evolution of life and the possibilities for finding life on other planets, including the search for extra-terrestrial intelligence.

ASTR 3311 Stellar Astrophysics  
Credit: 3 | Lecture: 3  
An introduction to topics in modern astrophysics. Celestial mechanics, atomic and stellar spectra, binary stars, stellar atmospheres, modeling stellar interiors, lives and deaths of stars, stellar remnants and black holes.  
Prerequisites: PHYS 2126, PHYS 2326, MATH 2414

ASTR 4311 Universal Origins  
Credit: 3 | Lecture: 3  
Origin of the universe, the Earth and life.  
Prerequisites: CHEM 1311, CHEM 1312 and PHYS 1301, PHYS 1302 or PHYS 2325 and PHYS 2326.

ASTR 4312 Principles of Astrobiophysics  
Credit: 3 | Lecture: 3  
Overview of the search for life in the universe, including origin and evolution of habitable planets in the solar system and beyond.  
Prerequisites: CHEM 1311, CHEM 1312 and PHYS 1301, PHYS 1302 or PHYS 2325, PHYS 2326

ASTR 4391 Selected Topics in Space Science  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

BAPA Business and Public Administration

BAPA 1301 Business Principles  
Credit: 3 | Lecture: 3  
Introduction to the role of business in modern society. Includes overview of business operations, analysis of the specialized fields within the business organization, and the development of a business vocabulary.

BAPA 3321 Logical Analysis  
Credit: 3 | Lecture: 3  
Development of critical thinking skills based on an investigation of traditional approaches to correct and incorrect reasoning.
BIOL Biology

BIOL 1106 Laboratory for Biology for Science Majors I
Credit: 1 | Lecture: 0 | Lab: 3
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: 3
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 1108 Laboratory for Biology Non–Science Majors I
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory activities will reinforce a survey of biological principles with an emphasis on humans, including chemistry of life, cells, structure, function and reproduction. Credit may not be received for both BIOL 1106 and BIOL 1108.
Corequisites: BIOL 1308
BIOL 1109 Laboratory for Biology Non-Science Majors II
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory activities will reinforce a survey of biological principles with an emphasis on humans, including evolution, ecology, plant and animal diversity and physiology. Credit may not be received for both BIOL 1107 and BIOL 1109.
Corequisites: BIOL 1109

BIOL 1306 Biology for Science Majors I
Credit: 3 | Lecture: 3 | Lab: 0
A general biology course including biochemistry, cell biology, cell metabolism and energetics, photosynthesis, genetics, evolution, taxonomy, bacteria and viruses. Credit may not be received for both BIOL 1306 and BIOL 1308.
Corequisites: BIOL 1106

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 1308 Biology for Non-Science Majors I
Credit: 3 | Lecture: 3 | Lab: 0
Provides a survey of biological principles with an emphasis on humans, including chemistry of life, cells, structure, function and reproduction. Credit may not be received for both BIOL 1306 and BIOL 1308.
Corequisites: BIOL 1108

BIOL 1309 Biology for Non-Science Majors II
Credit: 3 | Lecture: 3 | Lab: 0
This course will provide a survey of biological principles with an emphasis on humans, including evolution, ecology, plant and animal diversity and physiology. Credit may not be received for both BIOL 1307 and BIOL 1309.
Corequisites: BIOL 1109

BIOL 2101 Laboratory for Anatomy and Physiology I
Credit: 1 | Lecture: 0 | Lab: 3
Lab study of the structure and function of the integumentary, skeletal, muscular, nervous and endocrine systems. Not for Biology or Fitness & Performance majors; does not count toward any B.S. or B.A. degree specialization in Biology.
Corequisites: BIOL 2301

BIOL 2102 Laboratory for Anatomy and Physiology II
Credit: 1 | Lecture: 0 | Lab: 3
Lab study of the structure and function of the cardiovascular, respiratory, digestive, urinary and reproductive systems. Basic principles of genetics are included. Not for Biology or Fitness & Performance majors; does not count toward any B.S. or B.A. degree specialization in Biology.
Corequisites: BIOL 2302

BIOL 2121 Laboratory for Microbiology for Science Majors
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory exercises using culture of microorganisms grown on selected media. 
Prerequisites: BIOL 1306, BIOL 1307, CHEM 1311, CHEM 1312
Corequisites: BIOL 2321
BIOL 2301 Anatomy & Physiology I  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of the structure and function of the integumentary, skeletal, muscular, nervous and endocrine systems. Not for Biology or Fitness & Performance majors; does not count toward any B.S. or B.A. degree specialization in Biology.  
Corequisites: BIOL 2101

BIOL 2302 Anatomy & Physiology II  
Credit: 3 | Lecture: 3 | Lab: 0  
Lab study of the structure and function of the cardiovascular, respiratory, digestive, urinary and reproductive systems. Basic principles of genetics are included. Not for Biology or Fitness & Performance majors; does not count toward any B.S. or B.A. degree specialization in Biology.  
Prerequisites: BIOL 2301 and BIOL 2101  
Corequisites: BIOL 2102

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 2428 Vertebrate Zoology  
Credit: 4 | Lecture: 3 | Lab: 1  
Lecture and laboratory exercises on the structure, development, physiology and natural history of the vertebrate animals with emphasis on comparative evolution.  
Prerequisites: BIOL 1306, BIOL 1307

BIOL 3113 Laboratory for Plant Anatomy  
Credit: 1 | Lecture: 0 | Lab: 3  
Examination of plant structure and function by comparing differences in the major tissue types in each plant organ (leaf, root, stem and reproductive). Students will prepare tissue mounts of both nutrient sufficient and deficient plants to examine structural changes in the different tissues.  
Corequisites: BIOL 3313

BIOL 3141 Laboratory for Molecular Genetics  
Credit: 1 | Lab: 3  
Laboratory investigations using molecular genetics to demonstrate principles of transmission and population genetics.  
Prerequisites: BIOL 1306 and 1307  
Corequisites: BIOL 3341

BIOL 3173 Laboratory for Human Anatomy  
Credit: 1 | Lecture: 0 | Lab: 3  
The structure of the human body will be studied using anatomical models, preserved tissue specimens and computer programs.  
Prerequisites: BIOL 1306 and BIOL 1307  
Corequisites: BIOL 3373

BIOL 3306 Development of the Sciences  
Credit: 3 | Lecture: 3 | Lab: 0  
Concepts, techniques, practices and philosophy of science, illustrated with historical and contemporary examples. Biology majors may use only as an unrestricted elective.
BIOL 3307 Cell Biology  
**Credit:** 3 | **Lecture:** 3  
Study of cell structure and function, including chemical components of cells, membrane transport, cell signaling, flow of genetic information, cell growth, and cell division. Experimental techniques used in understanding cell biology will be discussed along with the cellular basis of human diseases. 
**Prerequisites:** BIOL 1306, BIOL 1307, CHEM 1311, CHEM 1312  

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 3313 Plant Anatomy  
**Credit:** 3 | **Lecture:** 3  
Structures, tissues and cells of vegetative and reproductive organs of land plants related to concepts of growth, differentiation and organization function and evolutionary history. 
**Prerequisites:** BIOL 1306, BIOL 1307  
**Corequisites:** BIOL 3113  

BIOL 3316 Introduction to Herpetology  
**Credit:** 3 | **Lecture:** 3  
This course is designed to give the student a basic understanding of the science of Herpetology including an overview of the characteristics of reptiles and amphibians; with special emphasis on snakes. Classes will include training on collection, handling and identification of local species with some off-campus field trips to local areas and zoos. 
**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 3334 Pathogenic and Public Health Microbiology  
**Credit:** 3 | **Lecture:** 3  
Focuses on the causality of infectious diseases, modes of dissemination, laboratory diagnosis and prevention and control. 
**Prerequisites:** BIOL 1306, BIOL 1307  

BIOL 3335 Epidemiology  
**Credit:** 3 | **Lecture:** 3  
A study of the causes and clinical methods of controlling disease in large populations. 
**Prerequisites:** BIOL 1306, BIOL 1307  

BIOL 3336 Neuropsychology Practicum  
**Credit:** 3 | **Lecture:** 3  
Laboratory investigation of brain/behavior relationships in the rat. Readings from primary research literature, lab experiments and research reports. 
**Prerequisites:** Permission of instructor (HSH) and BIOL faculty adviser.  

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  
**Corequisites:** BIOL 3141
BIOL 3373 Human Anatomy
Credit: 3 | Lecture: 3
Fundamentals of human anatomy emphasizing an organ systems approach to the study of the human body. Lecture and demonstration.
Prerequisites: BIOL 1306 and BIOL 1307
Corequisites: BIOL 3173

BIOL 4113 Laboratory for Biology of Fishes
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory course on identification, anatomy, morphology and ecology of fish. Weekend or weekday field trips and collections required.
Corequisites: BIOL 4313

BIOL 4114 Laboratory for Freshwater Biology
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory study of freshwater organisms and multiple weekends and/or weekday field trips to study sites off campus.
Corequisites: BIOL 4314

BIOL 4189 Independent Study in Biology
Credit: 1 | Lecture: 1 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

BIOL 4191 Laboratory Topics in Biology
Credit: 1 | Lab: 3
Identified by specific title each time laboratory is offered

BIOL 4195 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.

BIOL 4211 Laboratory for Ecology
Credit: 2 | Lab: 2
Four laboratory hours per week. Conduct experiments on population growth, competition and predation to test theoretical models; construct life tables.
Prerequisites: BIOL 4311

BIOL 4225 Environmental Toxicology Laboratory
Credit: 2 | Lecture: 0 | Lab: 2
Theory and practice in aquatic toxicity testing using EPA standard methods.
Prerequisites: BIOL 4325.

BIOL 4241 Laboratory for Physiology
Credit: 2 | Lab: 2
Laboratory exercises demonstrating physiological processes.
Prerequisites: BIOL 4344 or BIOL 4345.

BIOL 4242 Laboratory for Biochemistry
Credit: 2 | Lecture: 0 | Lab: 2
Laboratory exercises in Biochemistry.
Prerequisites: BIOL 4341.
BIOL 4252 Molecular Biology Laboratory
Credit: 2 | Lab: 2
Laboratory methods and techniques in molecular biology.
Prerequisites: BIOL 3341.

BIOL 4253 Laboratory for Biotechnology
Credit: 2 | Lecture: 0 | Lab: 2
Current methods used in biotechnological industry and research as applied to medical, biological, agricultural and environmental aspects. Students will learn modern techniques used in genetic engineering, DNA sequencing, gene cloning, etc.
Prerequisites: BIOL 3341

BIOL 4254 Laboratory for Eukaryotic Gene Expression
Credit: 2 | Lab: 2
Practical training in current gene expression studies, including isolation, quantification and handling of RNA, cDNA synthesis, RT-PCR and quantitative PCR. Microarrays and RNAi techniques are also discussed.
Prerequisites: BIOL 3341

BIOL 4278 Seminar in Biology
Credit: 2 | Lecture: 2
Study of objectives, methods and culture of biological science. Literature surveys, presentations and research papers are required. Students should be in their last 12 hours of coursework.

BIOL 4289 Independent Study in Biology
Credit: 2 | Lecture: 2 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

BIOL 4291 Laboratory Topics in Biology
Credit: 2 | Lecture: 0 | Lab: 2
Identified by specific title each time laboratory is offered.

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.

BIOL 4311 Ecology
Credit: 3 | Lecture: 3
Theoretical study of organisms, populations and communities related to their environments.
Prerequisites: BIOL 1306, BIOL 1307

BIOL 4313 Biology of Fishes
Credit: 3 | Lecture: 3
Systematic study of freshwater and marine fishes, including evolution, ecology, life history and economics of important species.
Prerequisites: BIOL 1306, BIOL 1307
Corequisites: BIOL 4113

BIOL 4314 Freshwater Biology
Credit: 3 | Lecture: 3
Study of the physical, chemical and biology nature of freshwater lakes, ponds, rivers and streams.
Prerequisites: BIOL 4311
Corequisites: BIOL 4114
BIOL 4315 Biology Practicum
Credit: 3 | Lecture: 3
Practical experience at an off-campus facility, such as a laboratory, aquarium, park, wetlands center or Galveston Bay non-profit. Requires junior or senior standing, pre-acceptance interview, minimum of 10 hours of work per week and approval of instructor.

BIOL 4323 Field Biology
Credit: 3 | Lecture: 3
Field methods for analysis of ecological systems. Field work is required.
Prerequisites: BIOL 1306, BIOL 1307

BIOL 4325 Environmental Toxicology
Credit: 3 | Lecture: 3
Physiological and systemic effects of chemical pollutants on animals, with special emphasis on human health and disease.
Prerequisites: BIOL 1306, BIOL 1307 and CHEM 2323

BIOL 4327 Plant Identification
Credit: 3 | Lecture: 3
Taxonomic study of herbaceous and woody plants of SE Texas.
Prerequisites: BIOL 1306 and BIOL 1307

BIOL 4332 Histology
Credit: 3 | Lecture: 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
Credit: 3 | Lecture: 3
Study of activity and mechanisms of microbial contribution to global ecosystems, with emphasis on geochemical cycling, bioremediation, wastewater treatment, metagenomics and independent investigations.
Prerequisites: BIOL 2321 and BIOL 2121

BIOL 4335 Forensic Biology
Credit: 3 | Lecture: 3
Theory and techniques used in biological investigations of crimes, including toxicological, genetic and DNA analysis.
Prerequisites: BIOL 3341, BIOL 4341

BIOL 4341 Biochemistry I
Credit: 3 | Lecture: 3
Study of cellular biochemical components and metabolism.
Prerequisites: BIOL 1306, BIOL 1307 and CHEM 2323

BIOL 4342 Biochemistry II
Credit: 3 | Lecture: 3
Regulation and control of intermediary metabolism. Introduction to biochemical genetics.
Prerequisites: BIOL 4341.

BIOL 4343 Plant Physiology
Credit: 3 | Lecture: 3
Metabolic and physiological processes involved in plant growth.
Prerequisites: BIOL 1306, BIOL 1307.
BIOL 4344 Comparative Animal Physiology
Credit: 3 | Lecture: 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
Credit: 3 | Lecture: 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 4346 Pathophysiology
Credit: 3 | Lecture: 3
This course will study the abnormal physiology characteristic of diseases in humans. A physiological systems approach will be taken.
Prerequisites: BIOL 4345.

BIOL 4347 Cellular Physiology
Credit: 3 | Lecture: 3
Cell structure and function; emphasis on cytological, biochemical, genetical and developmental perspectives.
Prerequisites: BIOL 4341

BIOL 4348 Developmental Biology
Credit: 3 | Lecture: 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 4349 Plant Development
Credit: 3 | Lecture: 3
Study of the developmental processes involved in seed germination, tissue differentiation, vegetative growth and transitioning to reproduction.
Prerequisites: BIOL 1306, BIOL 1307

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 4354 Introduction to Bioinformatics
Credit: 3 | Lecture: 3
Experimental sources of biological data, databases and internet tools.
Prerequisites: BIOL 3341

BIOL 4355 Tissue Culture
Credit: 3 | Lecture: 3
Students will learn how to manipulate cells in culture and develop laboratory skills in DNA transfection, gene expression, Luciferase assays and western blots.
Prerequisites: BIOL 3341
BIOL 4361 Immunology  
Credit: 3 | Lecture: 3  
Basic theory of humoral and cellular immune mechanisms, structure and function of antibodies, cellular and physiological consequences of immunological responses.  
*Prerequisites: BIOL 2321 and either 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 4389 Independent Study in Biology  
Credit: 3 | Lecture: 3  
*Prerequisites: Approval of instructor, chair and associate dean.*

BIOL 4391 Selected Topics in the Biological Sciences  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

**BSCI Behavioral Sciences**

BSCI 4389 Independent Study in Behavioral Sciences  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

BSCI 4391 Selected Topics in Behavioral Sciences  
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.

**CENG Computer Engineering**

CENG 2112 Laboratory for Digital Circuits  
Credit: 1Lab: 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 3113 Laboratory for Linear Circuits  
Credit: 1Lab: 3  
Laboratory experiments demonstrating AC/DC circuits. Experiments using lumped constants and integrated circuits will be stressed.  
*Corequisites: CENG 3313*

CENG 3114 Laboratory for Advanced Linear Circuits  
Credit: 1 | Lecture: 0 | Lab: 3  
Experiments emphasizing the design and analysis of linear lumped-constant circuits.  
*Corequisites: CENG 3314*
CENG 3116 Laboratory for Electronics
Credit: 1 | Lab: 3
The course consists of experimental laboratory projects that explore the design, construction, and debugging of basic electronic circuits. Projects involve EDA-tool based simulation and hands-on experiments, investigate the performance characteristics of diodes, transistors, JFETs, and op-amps including the construction of differential amplifier, summing amplifier, full wave rectifier, and common emitter amplifier.
Corequisites: CENG 3316

CENG 3131 Laboratory for Telecommunications and Networks
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory experiments in digital and data communications.
Corequisites: CENG 3331

CENG 3151 Laboratory for Computer Architecture
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory experiments for Computer Architecture Design and Interfacing.
Corequisites: CENG 3351

CENG 3264 Engineering Design and Project Management
Credit: 2 | Lecture: 1 | Lab: 2
Introduction to engineering concepts including problem solving, the design process, engineering tools and topics in ethics. Laboratory instruction.

CENG 3313 Linear Circuits
Credit: 3 | Lecture: 3
Basic electrical concepts; network theorems; circuit laws; resistance, capacitance, inductance, operational amplifiers, response of RC, RL and RLC circuits to initial conditions and constant forcing functions. Steady-state and transient analysis. Introduction to S-domain circuit analysis. Integration of computer applications using Multisim and MATLAB.
Prerequisites: MATH 2320, MATH 2414, PHYS 2326, PHYS 2126
Corequisites: CENG 3113

CENG 3314 Advanced Linear Circuits
Credit: 3 | Lecture: 3
Polyphase AC circuit analysis and design, network and passive and active analog filter design using MATLAB and Multisim, time and frequency domain analysis utilizing Fourier series and Fourier analysis techniques.
Prerequisites: CENG 3113, CENG 3313
Corequisites: CENG 3114

CENG 3315 Introduction to Digital Signal Processing
Credit: 3 | Lecture: 3
Sinusoids, spectrum representation, sampling and aliasing, FIR and IIR digital filters. Laboratory instruction.
Prerequisites: CSCI 1320, MATH 2413, MATH 2414, MATH 2305
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 3331 Introduction to Telecommunications and Networks
Credit: 3 | Lecture: 3
Introduction to data communications, error detecting/correcting codes, multiplexing, circuit and packet switching and local area networks.
Prerequisites: CENG 2312
Corequisites: CENG 3131

CENG 3351 Computer Architecture
Credit: 3 | Lecture: 3
Performance analysis of computer systems, representing data and instructions, instruction set architecture, datapath and controller design, pipelining, superscalar architectures, memory components such as cache, main memory and virtual memory, multiprocessors.
Prerequisites: CENG 2312, CENG 2371 or CSCI 2331.
Corequisites: CENG 3151

CENG 4113 Laboratory for Microprocessor Interfacing
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory experiments interfacing the Intel microcomputer to peripherals, memory, and other devices.
Corequisites: CENG 4313

CENG 4179 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: 15 hours of upper-level credit; approval by program chair and associate dean.

CENG 4189 Independent Study in Computer Engineering
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

CENG 4195 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 4265 Senior Project
Credit: 2 | Lecture: 1 | Lab: 2
Project course requiring each student to complete a project approved by the instructor. The student must submit a written final report and give an oral presentation to faculty and students. Laboratory instruction.
Prerequisites: CENG 3264 and CENG 4313 or CENG 4354.
CENG 4266 Senior Project  
**Credit:** 2 | **Lecture:** 1 | **Lab:** 2  
Project course requiring each student to complete a project approved by the instructor. The student must submit a written final report and give an oral presentation to faculty and students. Laboratory instruction.  
*Prerequisites:* CENG 3264 and CENG 4313 or CENG 4354

CENG 4279 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:* 15 hours of upper-level credit; approval by program chair and associate dean.

CENG 4289 Independent Study in Computer Engineering  
**Credit:** 2 | **Lecture:** 2  
*Prerequisites:* Approval of instructor, chair and associate dean.

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.

CENG 4351 Introduction to Robotics  
**Credit:** 3 | **Lecture:** 3  
The course introduces the use of various robotic systems and the techniques necessary to design and develop hardware components and software applications using robotic operating systems.  
*Prerequisites:* CENG 2371

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 4362 Digital Control Design  
**Credit:** 3 | **Lecture:** 3  
Analysis and design of digital control systems with applications critical systems.  
*Prerequisites:* CENG 4331

CENG 4379 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:* 15 hours of upper-level credit; approval by program chair and associate dean.
CENG 4389 Independent Study in Computer Engineering
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean.

CENG 4391 Selected Topics in Computer Engineering
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

CHEM Chemistry

CHEM 1105 Laboratory for Introductory Chemistry I
Credit: 1 | Lecture: 0 | Lab: 3
Laboratory for introductory chemistry that may include topics in inorganic, organic, biochemistry, food/physiological chemistry, forensic and environmental/consumer chemistry. Credit may not be received for both CHEM 1105 and CHEM 1111.
Corequisites: CHEM 1305

CHEM 1111 Laboratory for General Chemistry I
Credit: 1 | Lecture: 0 | Lab: 3
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 1305 Introductory Chemistry I
Credit: 3 | Lecture: 3
A survey course introducing chemistry, including topics in inorganic, organic, biochemistry, food/physiological chemistry, forensic and environmental/consumer chemistry. Designed for non-science majors. Credit may not be received for both CHEM 1305 and CHEM 1311.
Corequisites: CHEM 1105

CHEM 1311 General Chemistry I
Credit: 3 | Lecture: 3 | Lab: 0
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. Credit may not be received for both CHEM 1305 and CHEM 1311.
Corequisites: CHEM 1111

CHEM 1112 Laboratory for General Chemistry II
Credit: 1 | Lecture: 0 | Lab: 3
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 1275 Survey of Forensic Chemistry
Credit: 2 | Lecture: 0 | Lab: 2
This course will survey current methods in Forensic Science (especially chemistry) by examining real cases.

CHEM 1312 Laboratory for General Chemistry II
Credit: 1 | Lecture: 0 | Lab: 3
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 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
Corequisites: CHEM 1112

CHEM 1372 Diet and Nutrition Chemistry
Credit: 3 | Lecture: 3
This is a survey course designed for non-science and allied health students. It includes the effects of nutrients on health and the role of diet in prevention or treatment of chronic diseases.

CHEM 2101 Laboratory for Analytical Chemistry I
Credit: 1 | Lecture: 0 | Lab: 3
This course provides hands-on training on analysis, sampling, statistical treatment and basic skills in analytical chemistry.
Prerequisites: CHEM 1311, CHEM 1312
Corequisites: CHEM 2301

CHEM 2102 Laboratory for Analytical Chemistry II
Credit: 1 | Lecture: 0 | Lab: 3
This course provides hands-on experience in modern instrumental techniques in analytical chemistry. Includes UV-vis absorption, IR vibrational spectroscopy, gas chromatography (GC), high performance liquid chromatography (HPLC) and NMR etc.
Prerequisites: CHEM 1311, CHEM 1312
Corequisites: CHEM 2302

CHEM 2123 Laboratory for Organic Chemistry I
Credit: 1 | Lecture: 0 | Lab: 3
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
Corequisites: CHEM 2323

CHEM 2125 Laboratory for Organic Chemistry II
Credit: 1 | Lecture: 0 | Lab: 3
Extension of CHEM 2123; building from basic procedures and lab techniques to a more advanced level.
Prerequisites: CHEM 1311, CHEM 2123
Corequisites: CHEM 2325

CHEM 2301 Analytical Chemistry I
Credit: 3 | Lecture: 3
An introduction to the theory of analytical chemistry; different approaches to analysis, sampling, statistical treatment and basic principles in analytical chemistry.
Prerequisites: CHEM 1311, CHEM 1312
Corequisites: CHEM 2101
CHEM 2302 Analytical Chemistry II  
Credit: 3 | Lecture: 3  
An introduction to instrumental techniques, providing an introductory survey of modern instrumental techniques in analytical chemistry. Includes electrochemical, spectroscopic and chromatographic methods for the determination of atomic and molecular species. Specific topics in spectroscopy to be considered are UV–vis absorption, IR vibrational spectroscopy. Topics in chromatography include gas chromatography (GC), high performance liquid chromatography (HPLC).  
Prerequisites: CHEM 1311, CHEM 1312  
Corequisites: CHEM 2101

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  
Corequisites: CHEM 2123

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  
Corequisites: CHEM 2125

CHEM 2377 Life and the Universe  
Credit: 3 | Lecture: 3  
Origin of the Universe, origin and evolution of life and the possibilities for finding life on other planets, including the search for extra-terrestrial intelligence.

CHEM 3310 Advanced Chemical Calculations  
Credit: 3 | Lecture: 3 | Lab: 0  
Prepares chemistry and biology students for math in Physical Chemistry and Biochemistry, using examples geared to these subjects.  
Prerequisites: CHEM 1311 & CHEM 1312, MATH 2413 & MATH 2414, PHYS 2325 or PHYS 1301 & PHYS 1302.

CHEM 3315 Survey of Instrumental Analysis  
Credit: 3 | Lecture: 2 | Lab: 2  
The emphasis of this course is on practical aspects of chemical analysis using instrumental techniques. Lab exercises will include UV–Vis spectrophotometry, fluorescence spectroscopy, IR spectroscopy, GC–MS, LC–MS, and NMR spectroscopy. Biomedical, environmental, and industrial applications will be considered. Cannot count toward a Chemistry major.  
Prerequisites: CHEM 2323, CHEM 2123, CHEM 2325, CHEM 2125.

CHEM 3320 Survey of Physical Chemistry  
Credit: 3 | Lecture: 3  
Appropriate for students pursuing the BA in Chemistry or a BS in Environmental Science. An overview of physical chemistry, thermodynamics, molecular structure, spectroscopy.  
Prerequisites: CHEM 1311, CHEM 1312 and MATH 2413 and PHYS 1301, PHYS 1302.

CHEM 3333 Environmental Chemistry  
Credit: 3 | Lecture: 3  
Chemical processes and reactions related to chemical pollution problems and their control in the atmosphere, soils and waters.  
Prerequisites: CHEM 1311, CHEM 1312 or equivalent.
CHEM 3335 Fundamentals of Inorganic Chemistry
Credit: 3 | Lecture: 3
Basic knowledge of inorganic compounds such as chemical bonding, structures and reactivity of each group element in inorganic chemistry. The chemistry of elements and their compounds in each class and the types of reactions will be highlighted. These also include boron chemistry, main group, transition metals, and crystal chemistry.
Prerequisites: CHEM 1311, CHEM 1312.

CHEM 4115 Chemistry Practicum
Credit: 1 | Lecture: 1
Practical training in teaching an undergraduate chemistry lab, assisting a teaching assistant. Requires pre-acceptance interview, minimum of 6 hours of work per week and approval of instructor.

CHEM 4189 Independent Study in Chemistry
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

CHEM 4195 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 4222 Laboratory for Physical Chemistry
Credit: 2 | Lecture: 0 | Lab: 4
Laboratory principles and practice in physical chemistry. Six laboratory hours each week. CHEM 4321 may be taken concurrently.
Prerequisites: CHEM 4321

CHEM 4235 Advanced Lab for Inorganic Chemistry
Credit: 2 | Lecture: 0 | Lab: 4
Laboratory principles and basic manipulation skills used during the preparation and characterization of inorganic compounds.
Prerequisites: CHEM 1311, CHEM 1312 and CHEM 2323

CHEM 4242 Laboratory for Biochemistry
Credit: 2 | Lecture: 1 | Lab: 3
Laboratory principles and practices in cellular biochemistry. One hour of lecture and 3 hours of laboratory per week.
Prerequisites: CHEM 4341 or corequisite

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 4268 Lab for Instrumental Analysis
Credit: 2 | Lecture: 0 | Lab: 4
Laboratory exercises in instrumental analysis.
Prerequisites: CHEM 4373, CHEM 4274
Corequisites: CHEM 4367
CHEM 4274 Laboratory for Quantitative Chemical Analysis  
Credit: 2 | Lecture: 0 | Lab: 4  
Laboratory exercises in quantitative chemical analysis.  
Prerequisites: CHEM 2123, CHEM 2125, CHEM 2323, CHEM 2325  
Corequisites: CHEM 4373

CHEM 4311 Chemical Origins  
Credit: 3 | Lecture: 3  
Origin of the universe and the chemical elements, pre-biotic chemistry and the origin of life.  
Prerequisites: CHEM 1311, CHEM 1312 and PHYS 1301, PHYS 1302 or PHYS 2325 and PHYS 2326.

CHEM 4312 Principles of Astrobiochemistry  
Credit: 3 | Lecture: 3  
Overview of the search for life in the universe, including chemical signatures of life on other planets.  
Prerequisites: CHEM 1311, CHEM 1312 and PHYS 1301, PHYS 1302 or PHYS 2325, PHYS 2326.

CHEM 4315 Handedness in Science  
Credit: 3 | Lecture: 3  
Prerequisites: CHEM 1311, CHEM 1312 and PHYS 1301, PHYS 1302 or PHYS 2325, PHYS 2326.

CHEM 4321 Physical Chemistry I  
Credit: 3 | Lecture: 3  
Physical Chemistry (PC) I is not a prerequisite for Physical Chemistry II. PCI covers thermodynamics and kinetics. PCII covers quantum mechanics and spectroscopy. CHEM 4321 and CHEM 4322 may be taken in any order.  
Prerequisites: CHEM 1311, CHEM 1312, MATH 2413, MATH 2414, PHYS 2325 and PHYS 2326 and CHEM 4310.

CHEM 4322 Physical Chemistry II  
Credit: 3 | Lecture: 3  
Physical Chemistry (PC) I is not a prerequisite for Physical Chemistry II. PCI covers thermodynamics and kinetics. PCII covers quantum mechanics and spectroscopy. CHEM 4321 and CHEM 4322 may be taken in any order.  
Prerequisites: CHEM 1311, CHEM 1312, MATH 2413, MATH 2414 and PHYS 2325, PHYS 2326 and CHEM 4310.

CHEM 4328 Introduction to Medicinal Chemistry  
Credit: 3 | Lecture: 3  
Overview of key biological and biochemical concepts and the general tactics and strategies involved in developing an effective drug.  
Prerequisites: CHEM 2323, CHEM 2325.

CHEM 4335 Inorganic Chemistry  
Credit: 3 | Lecture: 3  
Concepts and systems of inorganic chemistry; atomic structure, molecular structure and bonding, ionic crystals, solid state defects and coordination compounds.  
Prerequisites: CHEM 1311, CHEM 1312 and CHEM 2323.
CHEM 4341 Biochemistry I  
Credit: 3 | Lecture: 3  
Study of cellular biochemical components and metabolism.  
Prerequisites: CHEM 2323, CHEM 4310 strongly recommended.

CHEM 4342 Biochemistry II  
Credit: 3 | Lecture: 3  
Regulation and control of intermediary metabolism. Introduction to biochemical genetics.  
Prerequisites: CHEM 4341.

CHEM 4352 Water Chemistry and Water Pollution  
Credit: 3 | Lecture: 3  
Study of chemical equilibria in natural waters, water quality parameters, water sampling, important water pollutants and their fate.  
Prerequisites: CHEM 1311, CHEM 1312 and CHEM 2323.

CHEM 4355 Environmental Sampling and Monitoring  
Credit: 3 | Lecture: 3  
Principles and techniques of environmental sampling for air, water, soil and hazardous wastes. EPA standard methods for environmental analysis using biological, chemical and instrumental techniques.  
Prerequisites: STAT 3308.

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 4357 Introduction to Biofuel  
Credit: 3 | Lecture: 3  
This course is an overview of biofuel production with fundamental concepts in biofuel production, renewable feedstocks, thermochemical and biochemical conversions of biomass to biofuel, environmental impacts, economics and life-cycle analysis; value-added processing of biofuel residues and selected case studies.  
Prerequisites: CHEM 2323 and CHEM 2325

CHEM 4358 Industrial Chemistry: Process and Environment  
Credit: 3 | Lecture: 3  
This course will survey a variety of industrially-important processes which are based on naturally occurring or petroleum derived organic materials. As an additional component of the course, the relevance and impact of various regulations of the Environmental Protection Agency will be explored.  
Prerequisites: CHEM 2323 and CHEM 2325

CHEM 4359 Drug Discovery and Design  
Credit: 3 | Lecture: 3  
Advanced topics in medicinal and pharmaceutical chemistry using a combination of traditional lectures, “round-table” discussions of journal articles, and hands-on exercises in the relevant computational techniques.  
Prerequisites: CHEM 2323 and CHEM 2325
CHEM 4360 Bio-organic and Medicinal Chemistry
Credit: 3 | Lecture: 3
Survey of the fields of biological chemistry in which organic chemistry plays a significant role. Topics such as enzymatic and enzyme-like catalysis, protein/enzyme structure-function relationships, enzyme cofactor chemistry and biochemistry, nucleic acid chemistry and biochemistry, bioconjugates, bioprobes and molecular recognition will be discussed.
Prerequisites: CHEM 2323, CHEM 2325

CHEM 4363 Forensic Chemistry
Credit: 3 | Lecture: 3
Provides students training in drug chemistry, chemistry of addiction, arson investigation, chemistry of explosives, poisons, estimating the time of death.
Prerequisites: CHEM 1311, CHEM 1312 or equivalent.

CHEM 4365 Introduction to Polymer Chemistry
Credit: 3 | Lecture: 3
Introduction to chemistry, structure and properties of polymers.
Prerequisites: CHEM 1311 and CHEM 1312

CHEM 4367 Instrumental Analysis
Credit: 3 | Lecture: 3
The goal of the two-semester sequence of analytical chemistry is to understand the underlying principles and limitations of analytical chemistry methods and learn how to make reliable measurements. This course is dedicated to instrumental methods, such as spectroscopy, chromatography, electrophoresis, mass spectrometry, electrochemical techniques, and materials characterization techniques.
Prerequisites: CHEM 4274 and CHEM 4373 or instructor's permission.
Corequisites: CHEM 4268

CHEM 4368 Advanced Organic Chemistry
Credit: 3 | Lecture: 3
Advanced mechanistic study of the relationship between structure and reactivity in organic chemistry.
Prerequisites: CHEM 2323, CHEM 2325 or equivalent.

CHEM 4370 Industrial Chemistry: Process and Environment
Credit: 3 | Lecture: 3
Survey of industrially-important processes which are based on naturally-occurring or petroleum-derived organic materials. A component of the course involves Environmental Protection, such as the Clean Air and the Toxic Substances Control.
Prerequisites: CHEM 2323, CHEM 2325

CHEM 4371 Advanced Spectroscopic Analysis
Credit: 3 | Lecture: 3
Designed for students seeking advanced analytical studies through practical spectra analysis.
Prerequisites: CHEM 2323, CHEM 2325
CHEM 4372 Undergraduate Research I and Seminar  
Credit: 3 | Lecture: 3  
The selection, study and formal oral and written presentation of topics from the chemical literature and/or original research findings.  
Prerequisites: Approval of instructor.

CHEM 4373 Quantitative Chemical Analysis  
Credit: 3 | Lecture: 3  
The goal of the two-semester sequence of analytical chemistry is to understand the underlying principles and limitations of analytical chemistry methods and learn how to make reliable measurements. This course emphasizes relevant mathematical approaches, chemical equilibria, and “wet” methods of chemical analysis (volumetric and gravimetric techniques, titration, electrochemistry, and spectrophotometry).  
Prerequisites: CHEM 2323, CHEM 2325  
Corequisites: CHEM 4274

CHEM 4374 Surface Chemical Processing  
Credit: 3 | Lecture: 3  
The course topics cover relevant surface chemical phenomena as encountered in environmental and chemical/industrial applications. The course material will discuss the fundamental surface chemical processes and the role of surface/interface properties in scientific and industrial applications as well as the principles of conventional and advanced surface analytical techniques.  
Prerequisites: CHEM 1311, CHEM 1312

CHEM 4375 Petroleum Geology  
Credit: 3 | Lecture: 3  
This course studies the topics of the "petroleum system", origin and migration of hydrocarbons, reservoirs, traps and seals, sedimentary basins and some of the most commonly used methods in exploration and development.  
Prerequisites: GEOL 1303.

CHEM 4376 Introduction to Petroleum Chemistry  
Credit: 3 | Lecture: 3  
This course provides a broad understanding of the composition, chemical/physical properties of crude oil and petroleum products as well as the relative unit operations in industrial process.  
Prerequisites: CHEM 1311, CHEM 1312

CHEM 4379 Undergraduate Research II  
Credit: 3 | Lecture: 3  
Hands-on research in the field of chemistry A written report and presentation will be required.  
Prerequisites: CHEM 4372

CHEM 4389 Independent Study in Chemistry  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.

CHEM 4391 Selected Topics in Chemistry  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.
CINF 1370 Introduction to Computer Information Systems
Credit: 3 | Lecture: 3
A general overview of the computing field and its typical applications, information systems concepts and terminologies. Topics include hardware, software and telecommunication fundamentals, the internet, systems development methods and career opportunities. Hands-on experience using application software.

CINF 3311 Programming With Visual Basic
Credit: 3 | Lecture: 3

CINF 3321 Information Systems Theory and Practice
Credit: 3 | Lecture: 3
Introduction to the theory and practice of information systems. Development, application and management of IS. Hardware and software issues for IS. Ethical, social and security related issues of IS. IS environments. Laboratory instruction.
Prerequisites: CINF 1370 or approved equivalent course.

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: Junior or Senior standing.

CINF 3391 Topics in Computer Information Systems
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered. Laboratory instruction.

CINF 4189 Independent Study in Computer Information Systems
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

CINF 4195 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.

CINF 4289 Independent Study in Computer Information Systems
Credit: 2 | Lecture: 2
Prerequisites: Approval of instructor, chair and associate dean.
CINF 4308 Topics in Computer Information Systems—Non-Majors  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered. Not to be taken by majors in computing program. Laboratory instruction.

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

CINF 4321 Enterprise Resource Planning Systems  
Credit: 3 | Lecture: 3  
The course is designed to provide an overview of Enterprise Resource Planning (ERP) systems, and the important role it plays in an organization. The course content will illustrate the concepts, fundamental principles, framework, technology context and the technological architecture and infrastructure of a typical ERP system. Hands-on labs using SAP coupled with lectures and case studies will prepare the students with knowledge and skills sought after by businesses. Laboratory instruction.  
Prerequisites: CINF 3321 or approved equivalent course.

CINF 4323 Computer Security  
Credit: 3 | Lecture: 3  
Introduction to encryption, decryption and cryptographical protocols; security components; security policies and mechanisms in computer applications, computer systems and networks; legal/ethical issues in computer security. Laboratory instructions.  
Prerequisites: CSCI 2331, CSCI 3352.

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 4334 Electronic Commerce  
Credit: 3 | Lecture: 3  
Key concepts and principles of e-commerce; importance of e-commerce in the global economy; technological elements of the infrastructure of e-commerce; business and social factors associated with the success or failure of e-commerce; critical thinking to strategize and plan technology-based solutions to achieve business goals.  
Prerequisites: CINF 4320 or approval of instructor.

CINF 4364 Computer Systems Administration  
Credit: 3 | Lecture: 3  
Administration of computers and their operating systems, both as stand-alone and in network topologies. Unix is used as an example. Laboratory instruction.  
Prerequisites: CSCI 2315 or ITEC 3312 and senior standing.
CINF 4379 Internship in Computer Information Systems
Credit: 3 | Lecture: 3
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.
Prerequisites: 15 hours of upper-level credit; approval by adviser and associate dean.

CINF 4381 Computer Forensics
Credit: 3 | Lecture: 3
This course examines the various media and strategies of storing information. Students will learn different aspects of computer crime and ways in which to protect, uncover and understand digital evidence. Students will gain experience using hardware and software tools to perform investigations. Laboratory instruction.
Prerequisites: CSCI 1471 or CSCI 1370 or ITEC 2381

CINF 4388 Senior Project in Computer Information Systems
Credit: 3 | Lecture: 3
May be taken only during the final semester before graduation. Registration is restricted to students with an approved Candidate Plan of Study. Students develop a significant computer application for a realistic project in CIS that emphasizes the entire software lifecycle. Professional behavior, ethics and teamwork will be developed. Students prepare written reports and give oral presentations. Laboratory instruction.
Prerequisites: CSCI 4333 and CINF 4324

CINF 4389 Independent Study in Computer Information Systems
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean.

CINF 4391 Selected Topics in Computer Information Systems
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered. Laboratory instruction.

COMM Communication

COMM 1307 Introduction to Mass Communication
Credit: 3 | Lecture: 3 | Lab: 0
An introduction to mass media theory, convergence, media technology history and innovations, social media, and societal implications. Media literacy will be emphasized.

COMM 1315 Public Speaking
Credit: 3 | Lecture: 3 | Lab: 0
Application of communication theory and practice to the public speaking context with emphasis on audience analysis, speaker delivery, ethics of communication, cultural diversity, and speech organizational techniques to develop students' speaking abilities as well as their ability to effectively evaluate oral presentations.

COMM 3320 Principles of Public Relations
Credit: 3 | Lecture: 3 | Lab: 0
Overview of persuasive communication as it pertains in theory and practice to public relations, marketing and advertising practices.
COMM 3321 Media Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Journalistic writing, including fact gathering, news and feature writing styles, publication relations, and freelance writing. If taken at a lower level, communication majors may replace this course with an upper-level communication elective with permission for adviser. Communication majors must pass with a grade of "C" or better.

COMM 3340 Environmental Communication  
Credit: 3 | Lecture: 3 | Lab: 0  
In this course, students will learn the various means of communicating messages regarding environmental issues, whether these messages are created by organizations to advocate on behalf of the environment, to create perceptions of caring for the environment, or to define the environment.

COMM 3341 Storytelling and Oral Communication  
Credit: 3 | Lecture: 3 | Lab: 0  
This course uses embodied learning to explore three core forms of the oral tradition: oral histories, autobiographical narratives, and personal advocacy narratives.

COMM 3350 Visual Communication  
Credit: 3 | Lecture: 3 | Lab: 1  
Introduction to design elements and theory that are critical to creating media content to serve specific communication goals. Concepts covered include layout, color scheme, concept design, composition, balance, visual development, usability, interface design, and audience engagement.  
Prerequisites: ARTS 2371

COMM 3351 Mass Media and Society  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of mediated communication and media effects with an advanced critical cultural approach to media and society topics, relative theories and effects. Research- and writing-intensive course.

COMM 3352 Media Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Legal issues as pertinent to the professional communicator.

COMM 3353 Alternative Media Marketing  
Credit: 3 | Lecture: 3 | Lab: 0  
In-depth exploration of persuasive communication as it relates to alternative media marketing and integrated marketing communication campaigns that utilize persuasive communication, including marketing, advertising, and PR communication strategies.  
Prerequisites: Junior or Senior level standing.

COMM 3354 Gathering Information  
Credit: 3 | Lecture: 3 | Lab: 0  
Research techniques in which students identify and collect information from libraries, archives, databases, the internet and interviews. The gathered information is then used to write magazine articles, reports and strategic studies.

COMM 3355 Communication Ethics  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of a range of ethical principles and case studies with the ultimate goal of helping students work out their own professional standards and commit to them.
COMM 3356 Advertising Procedure
Credit: 3 | Lecture: 3 | Lab: 0
Study of consumer advertising from several perspectives: historical forces, advertising agency operations, and successful campaigns. Students learn about targeting demographics, innovative advertising methods, and how to identify and collect information.

COMM 3357 Crisis Communication
Credit: 3 | Lecture: 3 | Lab: 0
Examination of strategic communication practices throughout the three stages of a crisis event. Special emphasis is placed on crisis planning, media relationships, image restoration, ethical responses, and organizational learning.
Prerequisites: COMM 3320 or permission of instructor.

COMM 3360 Web Design
Credit: 3 | Lecture: 3 | Lab: 1
Fundamentals of Web design, including graphical editors, basic layouts, colors, and accessibility standards.
Prerequisites: ARTS 2371 or permission of instructor.

COMM 4061 Communication Portfolio
Credit: 0 | Lecture: 0 | Lab: 0
A pass/fail exit requirement included as part of the degree plan’s capstone requirement. Students showcase their best work, both textual and graphic, in an electronic portfolio.
Prerequisites: Must pass GSP test.

COMM 4301 Global Issues in Film
Credit: 3 | Lecture: 3 | Lab: 0
Global issues in media are addressed using a critical/cultural studies approach. Focuses on global mediated issues (film, texts, news, internet, etc.), in order to foster an understanding of diversity and to teach global media literacy.
Prerequisites: Junior/Senior status

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 4323 Public Relations Campaigns
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 DMST 5330.)
Prerequisites: COMM 3320 and/or COMM 4322, or permission of instructor.
COMM 4350 3D Computer Modeling  
Credit: 3 | Lecture: 0 | Lab: 3  
Introduction to 3D modeling techniques for animation, images, and 3D computer sculptures, including to build 3D models, modeling techniques used in 3D software applications. Texture mapping and lighting in a 3D environment.  
Prerequisites: ARTS 2371 and ARTS 3360 or permission of instructor.

COMM 4351 3D Animation  
Credit: 3 | Lecture: 0 | Lab: 3  
Fundamental principles of animation. Introduces students to 3D computer animation techniques including key framing, path animation, non-linear animation, and hierarchical animation. Covers story boarding and animation project planning.  
Prerequisites: COMM 4350

COMM 4352 Photojournalism  
Credit: 3 | Lecture: 0 | Lab: 3  
Exploration of photography as a form of journalistic storytelling. Includes study of technical and emotional aspects of photographs as well as techniques in Photoshop.  
Prerequisites: ARTS 2371

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 Narrative Video Production  
Credit: 3 | Lecture: 3 | Lab: 0  
This class focuses on the creation of short narrative. Hollywood-inspired videos. It takes students all the way from the first idea to writing a script, shooting & editing to the final distribution of the film. (Cross-listed with DMST 5535.)

COMM 4357 Documentary Video Production  
Credit: 3 | Lecture: 3 | Lab: 0  
This class teaches the basic of documentary video production, including the proper use of production equipment, developing a story line, and developing interview skills and research methods. (Cross-listed with DMST 5537.)

COMM 4358 Publication Design  
Credit: 3 | Lecture: 3 | Lab: 1  
Coverage of theory and technology related to creation of graphic products for offset printing. Includes examination of Photoshop, Illustrator, InDesign, and other software applications.  
Prerequisites: ARTS 2371
COMM 4359 Studio-Based Video Production
Credit: 3 | Lecture: 3 | Lab: 0
In this class, students are introduced to multi-camera studio set-ups. Students will rotate through all relevant positions of a typical production studio, including camera, sound, directing, etc.

COMM 4379 Communication Internship
Credit: 3 | Lecture: 3 | Lab: 0
A supervised on-site internship in a communication capacity.
Prerequisites: Must pass GSP test.

COMM 4389 Independent Study in Communication
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 3 hours of credit. For 1 hour of Independent Study credit, students should enroll in COMM 4189 Independent Study in Communications.

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.

COMM 4655 Media Production
Credit: 6 | Lecture: 0 | Lab: 6
Laboratory course covering journalistic writing, fact gathering, photography, videography, graphic design, social media, and advertising. Students will produce the student newspaper, The Signal.
Prerequisites: Must pass GSP test, COMM 3321.

COUN Counseling

COUN 1301 Addictions Counseling
Credit: 3 | Lecture: 3 | Lab: 0
A review of the research, theory, and history of addictions counseling including requirements for and scope of licensure and ethical guidelines as a chemical dependency counselor.

COUN 1302 Pharmacology of Addictions
Credit: 3 | Lecture: 3 | Lab: 0
Explores the different types of substances abused and the psychological and physiological consequences including tolerance, withdrawal, and drug interaction.

COUN 1304 Screening, Assessment, Diagnosis, and Referral
Credit: 3 | Lecture: 3 | Lab: 0
Explores the DSM diagnostic criteria for addictions, the different screening and assessments available for addictions and referral for other services. Use of a systematic biopsychosocial assessment and placement within the continuum of care will also be explored. Further dual diagnosis and its implications will be covered.
COUN 2301 Treatment Planning for Relapse Prevention
Credit: 3 | Lecture: 3 | Lab: 0
Explores the different models and methods of individualized treatment planning and relapse prevention including interdisciplinary medication assisted treatment, readiness for treatment, and ethical guidelines for treatment. Course will focus on involving the client in assessment of current issues and use of data driven methods for measuring treatment outcome. Content will also include methods to involve family when possible and build sober support networks such as Alcoholics and Narcotics Anonymous.

COUN 2302 Addictions Counseling Theories
Credit: 3 | Lecture: 3 | Lab: 0
Study of the most commonly used theoretical approaches to conceptualization and treatment of addictions.

COUN 2303 Addictions Intervention and Prevention
Credit: 3 | Lecture: 3 | Lab: 0
Investigates addiction professional’s role in prevention and intervention including strategies and interdisciplinary approaches available to impede the illegal use of alcohol, tobacco and other drugs and to foster safe, healthy, and drug-free environments.

COUN 2305 Group Process for Addictions
Credit: 3 | Lecture: 3 | Lab: 0
Explores group counseling skills and techniques including stages of group development and ethical issues specific to group process.

COUN 2306 Counseling Skills for Addictions Professionals
Credit: 3 | Lecture: 3 | Lab: 0
Course develops counseling micro-skills necessary to establish an effective therapeutic relationship with clients to reduce negative effects of substance use.

COUN 2307 Family Dynamics
Credit: 3 | Lecture: 3 | Lab: 0
Explores family as a dynamic system focusing on the effects of addiction on family roles, rules, and behavior patterns across generations using various family theories. Content will also focus on the family, social networks, and community systems role as a support system for the person with addiction and supports for family members such as codependent and Alateen support groups.

COUN 3301 Developmental Counseling
Credit: 3 | Lecture: 3 | Lab: 0
Provides an in-depth look at the science of human development and how it applies to the field of counseling. Using counseling applications, case studies, and journal questions, the course introduces developmental theories and research within the context of clinical practice.

COUN 3306 Career Counseling
Credit: 3 | Lecture: 3 | Lab: 0
Students will learn the basics of helping individuals involved in addictions recovery make career decisions, choices, and advocate for necessary mental health support on the job as well as explore the implications of legal action on various occupational choices.
COUN 3307 Wellness and Professional Practice  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores models and principles of stress management and wellness focused on self-awareness of personal, professional, and cultural variables.

COUN 3312 Socio–Cultural and Political Advocacy in Addictions Counseling  
Credit: 3 | Lecture: 3 | Lab: 0  
Examines current social, political, economic, and cultural context of addiction including risk and resiliency factors for individuals, groups, and their environment. Content will also include importance and method for developing and maintaining relationships with civic groups, agencies, other professionals, governmental entities, and the community for resources, referrals and advocacy.

COUN 3313 Addictions and Personal Nutrition  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduces counseling students to nutritional information as it relates to personal health and nutrition, and commonly held misconceptions.

COUN 4301 Documentation, Ethics and the Law for Addictions Counselors  
Credit: 3 | Lecture: 3 | Lab: 0  
Explore the Licensed Chemical Dependency Counselor (LCDC) rules in Texas and the NAADAC code of ethics for best practices. Content will also include billing/payment for services, insurance coverage, and current barriers to addictions services while striving to have parity with MH coverage.

COUN 4304 Adolescents and Addictions  
Credit: 3 | Lecture: 3 | Lab: 0  
Examines therapeutic approaches and techniques for counseling adolescents with addictions. Course will also focus on the other stakeholders such as parents and educational institution personnel that play a significant role in adolescent lives.

COUN 4305 Addictions and Specific Adult Populations  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores the best practices for addictions treatment with diverse populations focusing specifically on populations such as veterans, LGBTQ individuals, incarcerated individuals and those with HIV, AIDS, and other sexually transmitted diseases.

COUN 4306 Suicide and Violence Assessment, Prevention, and Treatment  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores suicide and violence assessment, prevention strategies and treatment protocols related to underlying substance use disorder. Course will also address use of setting specific policies and procedures for handling crisis and dangerous situations for safety of professional and clients.

COUN 4307 Consultation and Supervision for Addictions Professionals  
Credit: 3 | Lecture: 3 | Lab: 0  
Explores models and techniques of consultation and supervision. Course will address importance of ongoing supervision and continuing education.
COUN 4308 Process Addictions
Credit: 3 | Lecture: 3 | Lab: 0
Explores different types of process addictions, assessment, and available treatment options.

COUN 4309 Addictions Practicum
Credit: 3 | Lecture: 3 | Lab: 0
A 300-hour supervised practicum at a Clinical Training Institution (CTI) under the supervision of a LCDC or Qualified Credentialed Counselor (QCC).
Prerequisites: Admission to the Program and COUN 3303, COUN 3304, COUN 4301, COUN 4302, COUN 4306

COUN 4310 Learning Theories for Addiction Counselors
Credit: 3 | Lecture: 3 | Lab: 0
A study of major theories of learning, motivation, and cognition as they apply to addictions counseling.

COUN 4389 Independent Study Course
Credit: 3 | Lecture: 3 | Lab: 0
Course offered under special circumstances to students in the B.S. in Addictions program.
Prerequisites: Admission to the B.S. in Addictions program; Approval of instructor, chair, and Associate Dean.

COUN 4391 Special Topics
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered.
Prerequisites: Admission to the B.S. in Addictions program or instructor permission.

CRIM Criminal Justice and Criminology

CRIM 1301 Introduction to Criminal Justice
Credit: 3 | Lecture: 3 | Lab: 0
History, philosophy, and ethical considerations of criminal justice; the nature and impact of crime; and an overview of the criminal justice system, including law enforcement and court procedures.

CRIM 3300 Gender and Crime
Credit: 3 | Lecture: 3 | Lab: 0
Examines gender, gender roles, and how gender impacts criminal behavior in four major components: offending, victimization, criminal processing, and working in the criminal justice system.

CRIM 3312 Criminology
Credit: 3 | Lecture: 3 | Lab: 0
Theories of causation; patterns and social response.

CRIM 3314 Terrorism and Homeland Security
Credit: 3 | Lecture: 3 | Lab: 0
Examines the history of terrorism and its manifestations in the contemporary world. Terrorism in the U.S. and various components of homeland security are discussed.

CRIM 3330 Ethics in Criminal Justice
Credit: 3 | Lecture: 3 | Lab: 0
Examination of ethical issues in the criminal justice field, including police deviance, judicial misconduct, control of inmates in correctional settings, and field research dilemmas.
CRIM 3333 Victimology
Credit: 3 | Lecture: 3 | Lab: 0
Provides a historical overview of the study of victimization in addition to existing theories, specific types of victimization, and criminal justice/social service responses to crime victimization.

CRIM 4306 Service Learning
Credit: 3 | Lecture: 3 | Lab: 0
Service Learning is a course designed for students to take an active part in organized experiences that meet actual community needs combined with academic instruction, focusing on critical, reflective thinking and personal and civic responsibility. This course will involve students in activities that address community-identified needs with service integrating academic skills.

CRIM 4313 Juvenile Delinquency
Credit: 3 | Lecture: 3 | Lab: 0
Individual and community aspects of juvenile delinquency; theories of causes and modes of control.

CRIM 4330 Criminal Investigation
Credit: 3 | Lecture: 3 | Lab: 0
Review of methods and techniques used by investigators to reconstruct a crime in order to arrest the criminal offender.

CRIM 4331 Corrections
Credit: 3 | Lecture: 3 | Lab: 0
Correctional institutions in the United States; analysis of their changing roles and functions.

CRIM 4333 Probation and Parole
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of alternatives to incarceration, emphasizing the major community-based activities of probation and parole. Includes discussion of intermediate punishments, restitution programs, house arrest, and electronic monitoring of offenders.

CRIM 4334 Criminal Law
Credit: 3 | Lecture: 3 | Lab: 0
Survey of structure and philosophy of criminal law; topics include criminal liability, criminal defenses, and types of offenses.

CRIM 4335 Race and Justice
Credit: 3 | Lecture: 3 | Lab: 0
Analysis of crime rates in the United States and the involvement of racial groups through theoretical exploration and practices in and out of the justice system.

CRIM 4338 Policing and Society
Credit: 3 | Lecture: 3 | Lab: 0
Critical analysis of the role and function of American law enforcement including historical development and evolution, contemporary police organizations, individual officers, and relationship between police and community. Leverage of objectives of police: law enforcement, service, order, maintenance, and crime prevention.

CRIM 4339 Youth, Law, and Society
Credit: 3 | Lecture: 3 | Lab: 0
Examination of youth culture and policing and the interaction of the two.
Prerequisites: Completion of CRIM 1301, CRIM 4313, and CRIM 4338
CRIM 4384 Statistics
Credit: 3 | Lecture: 3 | Lab: 1
Introductory course in statistics in criminology. Topics include both basic descriptive and inferential statistics.

CRIM 4385 Research Methods
Credit: 3 | Lecture: 3 | Lab: 0
Introductory course in research methods in criminology. Topics include theory and measurement, designing and conducting research, and data collection and analysis.

CRIM 4389 Independent Study in Criminology
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

CRIM 4390 Contemporary Issues in Criminology
Credit: 3 | Lecture: 3 | Lab: 0
Course assesses students' skills in theory, research, and subject content. Explores the many opportunities provided by degree in Criminology. Prerequisites: Completion of at least 80 credits and at least four courses in Criminology.

CRIM 4391 Selected Topics in Criminology
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.

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.)

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 | Lab: 0
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 lifecycle and testing. The course is programming-intensive with in-class assignments and weekly homework and a final project. Introduction to Arduino and number systems. Prerequisites: MATH 1314 or higher.
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 1470

CSCI 2305 Data Structures for Science and Engineering  
Credit: 3 | Lecture: 3  
Structured programming techniques, data structures and algorithms that include algorithm design and analysis, recursion, arrays, linked lists, stacks, queues, binary trees, hash tables, searching and sorting along with building abstract data types. Laboratory Instructions.  
Prerequisites: CSCI 1320

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 and Assembly Language  
Credit: 3 | Lecture: 3 | Lab: 0  
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.  
Prerequisites: (CSCI 1471 or CSCI 1370), MATH 2413

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 2414, (CSCI 1471 or CSCI 1370).

CSCI 3323 Object-Oriented Design and Programming
Credit: 3 | Lecture: 3
Basic elements of object-oriented technology including classes, their attributes, methods and relations to other classes, objects, classification and inheritance, encapsulation, polymorphism, object-oriented analysis, design and programming assignments in C++ language under UNIX. Laboratory instruction.
Prerequisites: CSCI 2315

CSCI 3331 Computer Organization and Assembly Language
Credit: 3 | Lecture: 3 | Lab: 0
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.
Prerequisites: CSCI 2315, MATH 2305, MATH 2414, PHYS 2325 and PHYS 2326.

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 3391 Selected Topics in Computing
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

CSCI 4189 Independent Study in Computer Science
Credit: 1 | Lecture: 1 | Lab: 0
Prerequisites: Approval of instructor, chair and associate dean.

CSCI 4195 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.

CSCI 4289 Independent Study in Computer Science
Credit: 2 | Lecture: 2
Prerequisites: Approval of instructor, chair and associate dean.
CSCI 4308 Topics in Computer Science – Non-Majors
Credit: 3 | Lecture: 3
Identified by topics each time the course is offered. Not to be taken for credit by majors in computing programs. Laboratory instruction.

CSCI 4312 Network Protocols
Credit: 3 | Lecture: 3
Data communications systems software concepts; computer network architecture; ISO model. Laboratory instruction.
Prerequisites: CSCI 2315

CSCI 4315 Advanced Software Development With .Net Framework and C#
Credit: 3 | Lecture: 3
In depth study of the managed environment provided by .NET Framework and its use in developing advanced windows applications utilizing OOP concepts and techniques. Includes GUI issues, event and exception handling, multi-threading, networking, collections, file and database access as well as an introduction to ASP.NET, Web Forms and Web Services.
Prerequisites: CSCI 2315

CSCI 4316 Advanced Enterprise Java and Framework
Credit: 3 | Lecture: 3
Study of current Methodologies used in the design and development of enterprise applications using advanced Java technologies will be familiarized. This course will provide a high-level overview of Java Enterprise ecosystem by looking at its core APIs in action. Other contents include JavaServer Faces (JSF), Context and Dependency Injection (CDI), JavaServer Pages (JSP), Java API for RESTful Web Services (JAX–RS), WebSocket API, JSON Processing API, Enterprise Java Beans (EJB), Java Message Services (JMS), Java Persistence API (JPA), and front-line Java frameworks like Spring, Django, WebLogic, and JUnit for developing the most dynamic and powerful enterprise sites on the web. Laboratory instruction.
Prerequisites: CSCI 2315

CSCI 4320 Web Application Development
Credit: 3 | Lecture: 3
Prerequisites: CSCI 2315.
CSCI 4323 Computer Security  
Credit: 3 | Lecture: 3  
Introduction to encryption, decryption and cryptographical protocols; security components; security policies and mechanisms in computer applications, computer systems and networks; legal/ethical issues in computer security. Laboratory instruction.  
Prerequisites: CSCI 1370 or CSCI 1471

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, SQL, relational algebra, normalization theory, DBMS, internet, database design, data flow diagrams, and implementation of database systems. Laboratory instruction.  
Prerequisites: CSCI 2315

CSCI 4335 Introduction to Artificial Intelligence  
Credit: 3 | Lecture: 3  
Introduction to concepts of artificial intelligence: Foundations of artificial intelligence, intelligent agents, searching, constraint satisfaction, planning, knowledge representation uncertain knowledge and reasoning, and learning. AI programming languages will be introduced. Students who receive credit for CSCI 5335 will not receive credit for this course.  
Prerequisites: CSCI 2315

CSCI 4336 Introduction to Machine Learning  
Credit: 3 | Lecture: 3  
Introduction to concepts of machine learning: elements of probability distributions and linear algebra, supervised and unsupervised learning, linear and nonlinear regression, classification, neural networks, support vector machines, sampling methods, K-Means clustering, principal component analysis, Bayesian networks, and reinforcement learning. Applicability of each technique will be discussed.  
Prerequisites: CSCI 2315

CSCI 4350 Computer Graphics and Interface Design  
Credit: 3 | Lecture: 3  
Two-dimensional graphics algorithms, point and coordinate transformations, animation on graphics terminals and systems. Laboratory instruction using Solaris X-Windows environment.  
Prerequisites: MATH 2318, MATH 2413

CSCI 4351 Advanced Programming in Unix  
Credit: 3 | Lecture: 3  
Program development in a multiprocessing environment, including; process and file system data structures, process control, synchronization and communication between concurrent processes, shared memory, threads and signals. Advanced input/output mechanisms such as asynchronous I/O and memory mapped I/O. Library functions including system function and database library routines. Laboratory instruction.  
Prerequisites: CSCI 1320, 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 2331, and senior standing.
Corequisites: CENG 3351

CSCI 4355 Programming Language Concepts
Credit: 3 | Lecture: 3
Coverage of the building blocks of programming languages including syntax, semantics, and various computer programming expressions. Introduction to the different programming paradigms such imperative, object-oriented, functional, logic, concurrent programming and how they support constructs such as types, assignment, functions, parameter passing, classes, encapsulation, inheritance, polymorphism and exception handling through coverage of examples from each paradigm. This course will include laboratory programming assignments.
Prerequisites: CSCI 2315

CSCI 4362 Computer Game Programming: Theory and Practice
Credit: 3 | Lecture: 3 | Lab: 0
Applying a fourth-generation game engine and language on designing and developing 2D and 3D real-time multimedia simulations and games for education, training, robotics and entertainment. Laboratory instruction.
Prerequisites: CSCI 2315

CSCI 4364 Computer Systems Administration
Credit: 3 | Lecture: 3
Administration of computers and their operating systems, both as stand-alone and in network topologies. Unix is used as an example. Laboratory instruction.
Prerequisites: CSCI 2315 and senior standing.

CSCI 4377 Introduction to Mobile Applications Development
Credit: 3 | Lecture: 3
Introduction to Mobile applications design and development principles. The study of the language and platform used for developing mobile applications on different mobile devices such as iOS and Android. Platform-specific topics will include design patterns such as Model-View-Controller, user interface, accessing device hardware features such as camera and GPS, and other mobile device features. Hands-on laboratory instructions provided using one of the popular mobile platforms.
Prerequisites: CSCI 1471 or equivalent.

CSCI 4379 Internship in Computer Science
Credit: 3 | Lecture: 3
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.
Prerequisites: 15 hours of upper-level credit; approval by adviser and associate dean.
CSCI 4381 Computer Forensics  
Credit: 3 | Lecture: 3  
Introduction to the topics of computer crime and computer forensics. Students will learn different aspects of computer crime and ways in which to protect, uncover and understand digital evidence. Students will gain experience using hardware and software tools to perform rudimentary investigations. Laboratory instruction.  
Prerequisites: CSCI 1471 or CSCI 1370

CSCI 4388 Senior Project in Computer Science  
Credit: 3 | Lecture: 3  
May be taken only during the final semester before graduation. Registration is restricted to students with an approved Candidate Plan of Study. Students develop a significant computer application for a realistic project. Emphasis will be on practical experience on all phases of constructing a computer solution. Professional behavior, ethics and teamwork will be developed throughout the project. Students prepare written reports and give oral presentations. Laboratory instruction.  
Prerequisites: CSCI 3352 and SWEN 4342.

CSCI 4389 Independent Study in Computer Science  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.

CSCI 4391 Selected Topics in Computer Science  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

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 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 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 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 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.

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: Prerequisites: Finite Math (MATH 1324)

DSCI 3322 Statistics II
Credit: 3 | Lecture: 3
Statistical inference, decision-making, prediction, sample design, significance tests, experimental design, non-parametric methods, decision theory, multiple regression and correlation, time series and index numbers.
Prerequisites: DSCI 3321 or equivalent.

DSCI 3331 Quantitative Methods for Management
Credit: 3 | Lecture: 3
Introduction to quantitative techniques for management; probability, inventory and production models, linear programming, queuing, replacement models, Markov analysis and network models. Previously taught as DSCI 3131; credit may not be received for both courses.
Prerequisites: DSCI 3321 or equivalent.

DSCI 4351 Forecasting Systems
Credit: 3 | Lecture: 3
Techniques for forecasting; time series, statistical methods and analysis of error.
Prerequisites: DSCI 3321 or equivalent.

DSCI 4389 Independent Studies in Decision Sciences
Credit: 3 | Lecture: 3
Independent directed study in Decision Sciences. 
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

DSCI 4391 Selected Topics in Decision Sciences
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.
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. This course requires some visits to off-campus locations.

ECED 1311 Historical and Recent Trends in Early Childhood Education
Credit: 3 | Lecture: 3 | Lab: 0
Historical, societal, political, and economic factors that influence progressive early childhood programs and child services.

ECED 1318 Nutrition, Health and Safety
Credit: 3 | Lecture: 3 | Lab: 0
Study of nutrition, health, safety and related activities, including skills development in management of issues, guidelines and practices in nutrition, community health, hygiene and safety. Integration of these principles applies to a variety of Early Childhood settings. This course requires some visits to off-campus locations.

ECED 1354 Developmental Theories of Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Focus on historic and current theories of children’s learning and development.

ECED 4302 Integrated Curriculum for Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Focus on the relationship among the content areas, skills, concepts and practices that support learning in young children. Integration of national and state standards into curriculum planning is featured. Field experiences required. 
Prerequisites: ECED 1354 and TCED 4303

ECED 4303 Child Guidance and Classroom Management for Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Theories and strategies for guiding the behavior of young children (birth to age five) inside and outside the classroom environment. Focus will be on effective strategies for behavior management, including the role of problem solving, the classroom community and family involvement. Field experiences required.

ECED 4305 Literacy Development Birth-Age 5
Credit: 3 | Lecture: 3 | Lab: 0
This course will cover language and literacy development for children birth through age five, including the beginning stages of reading and writing development, oral language development, parent involvement in literacy learning and appropriate curriculum for young children’s literacy development. Field experience required.
ECED 4306 Assessment of Young Children
Birth–Age 5
Credit: 3 | Lecture: 3 | Lab: 0
This course will cover formal and informal assessment strategies appropriate for children birth through age five. Assessment for children’s cognitive, social, physical and motor development for curriculum planning will be addressed as well as identifying children with developmental needs. This course requires students to identify and work with an individual child (birth – 5 years).

ECED 4307 Mathematics and Science in Early Childhood Education
Credit: 3 | Lecture: 3 | Lab: 0
This course will explore principles, methods and materials for integrating and applying appropriate mathematics and science education into early childhood curriculum. Field experience required.

ECED 4308 Creativity 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 4309 Advocacy and Parent Engagement
Credit: 3 | Lecture: 3 | Lab: 0
This course focuses on the historical and current role of advocacy in Early Childhood Education, the development of advocacy skills, as well as collaboration with stakeholders such as parents, schools, communities and federal, state and local government leaders. Strategies for developing successful parent, school and community involvement programs will be analyzed. Field experience will be required.

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 1354 and TCED 4303
ECED 4320 Play in Early Childhood Curriculum  
Credit: 3 | Lecture: 3 | Lab: 0  
Focus on philosophy, research and applications of modern play and environments for play. Influences of play on child development, cognition, culture and overall health. The role of play in the early childhood curriculum will be emphasized. Field experiences required.

ECED 4321 Advanced Topics: Infants and Toddlers  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of human development from prenatal stages through the first two years of life. Emphasis is placed on the interrelationship of cognitive, physical, social and emotional development in a variety of contexts and cultures. Appropriate curriculum and environment for infants and toddlers will be emphasized. Field experiences required.

ECED 4322 Cultural Awareness for Young Children  
Credit: 3 | Lecture: 3 | Lab: 0  
Focus on impact of diversity on development of young children. The influence of culture and social class on children's socialization and cognition will be discussed. Research and theories to support the development of minority children will be emphasized.  
Prerequisites: SILC 4315

ECED 4323 Advanced Topics: Preschool Curriculum  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of integrated curriculum for children age three to five, including appropriate content, methodology, environment, materials and resources. This course requires some visits to off-campus locations.

ECED 4324 Early Childhood Leadership, Program Development, and Management  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will introduce leadership skills necessary to manage and strengthen early care and education program. The course will also cover skills to go beyond individual programs to leadership in communities and in the field. The focus will be on collaboration, interconnections, relationships, and program quality. Overarching themes include the importance of excellence and diversity in early childhood programs, and the role of vision and reflective practice in reaching these goals. This course requires some visits to off-campus locations.

ECED 4325 Early Childhood Program Development & Management I - Leadership Strategies and Staff Development  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will introduce a model of facilitative leadership as a way to empower staff to support shared decision-making. Students will identify effective employment practices that will help them find and keep the right people for available jobs and their organizations. The course will also introduce a comprehensive model for supervising staff and promoting their ongoing professional development-based on recognizing and appreciating individual differences. This course is part of the Early Childhood Leadership Certificate. Only students pursuing this certificate may enroll in this course. This course has an additional course fee that will be applied towards the National Director's Credential.
ECED 4326 Effective and Positive Classroom Interactions for Young Children  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to improve practitioner's knowledge and skills regarding specific types of adult-child interactions that can have a positive impact on young children's development. Using state and nationally recognized criteria for high-quality interactions, this course will provide strategies that align with those criteria and that will prepare professionals to engage in positive and effective interactions with young children, toddlers through preschool. This course requires some students to identify and work with an individual child (birth – 5 years).

ECED 4327 Early Childhood Program Development & Management II – Managing Center Operations and Finance  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will introduce the components of effective management including: systems and the importance of systems thinking; stakeholder analysis and management; the strategic planning process; how policies, procedures, and systems are interconnected; and tools for taking charge of program operations. Students will learn how to manage a fiscally responsible early childhood business and be introduced to effective budgeting and accounting. Students will develop the skills needed to promote a positive public image and create environments that welcome and support the learning of children and adults. This course is part of the Early Childhood Leadership Certificate. Only students pursuing this certificate may enroll in this course. This course has an additional course fee that will be applied towards the National Director’s Credential.  
Prerequisites: ECED 4325 and ECED 4327

ECED 4329 Early Childhood Program Development & Management III – Implementing and Evaluating the Program  
Credit: 3 | Lecture: 3 | Lab: 0  
In this course students will learn to support young children's development and learning by understanding the interactive environment, the advantages of different groupings and staffing patterns, and continuity of care. Students will learn how to implement developmentally appropriate early childhood curriculum and the importance of observation and child assessment in achieving program goals. The students will explore the early childhood administrator's role in creating family partnerships, promoting an appreciation of diversity, nurturing open communication, the importance of program evaluation, and how to implement continuous quality improvement. This course is part of the Early Childhood Leadership Certificate. Only students pursuing this certificate may enroll in this course. This course has an additional course fee that will be applied towards the National Director’s Credential.  
Prerequisites: ECED 4325

ECED 4332 Teaching Young Children with Special Needs  
Credit: 3 | Lecture: 3 | Lab: 0  
This course integrates theory, law, research, and current evidence-based practices associated with serving young children (birth through age eight), who present a wide range of special needs, and their families. Emphasis includes the assessment process, eligibility of services, program design and an eclectic blend of approaches and strategies that can be utilized to meet individual child needs within the context of inclusive, natural environments. Field experiences required.  
Prerequisites: ECED 4325
ECED 4333 Advanced Studies in Young Children with Special Needs  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will extend key topics in early childhood special education and early intervention presented in the ECED 4332 course, specifically the strategies and techniques used by practitioners across a variety of settings serving children birth to age eight. Focus on course aims to enhance critical analysis of issues while broadening pedagogy knowledge and decision-making skills. Field experiences required.  
Prerequisites: ECED 4332

ECED 4377 Practicum  
Credit: 3 | Lecture: 3 | Lab: 0  
Supervised field experience in an approved early childhood educational setting. Permission of instructor required.

ECED 4389 Independent Study in Early Childhood Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

ECED 4391 Selected Topics in Early Childhood Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by title each time course is offered.

ECON Economics

ECON 2301 Principles of Macroeconomics  
Credit: 3 | Lecture: 3  
An analysis of the economy as a whole, including measurement and determination of aggregate demand and aggregate supply, national income, inflation and unemployment. Other topics include international trade, economic growth, business cycles, fiscal policy and monetary policy.

ECON 2302 Principles of Microeconomics  
Credit: 3 | Lecture: 3  
Analysis of the behavior of individual economic agents, including consumer behavior and demand, producer behavior and supply, price and output decisions by firms under various market structures, factor markets, market failures and international trade.

ECON 3311 Money and Banking  
Credit: 3 | Lecture: 3  
The role of money and the banking system in the economy; monetary theory and policy and international monetary conditions.  
Prerequisites: Principles of economics.

ECON 3321 Development Economics  
Credit: 3 | Lecture: 3  
An evaluation of the economic growth and development in developed and developing countries. Topics include determinants of economic growth, the roles of credit markets and political forces in growth, poverty, and health and nutrition.  
Prerequisites: Principles of Economics or equivalent
ECON 3361 Industrial Organization
Credit: 3 | Lecture: 3
The structure of contemporary industry and
the forces that have shaped it, including
manufacturing, trade and transportation.
The role of the large corporation in modern
industrial organization. The relation of industrial
structure to economic behavior and performance.
Prerequisites: Principles of Macroeconomics

ECON 3371 Public Finance
Credit: 3 | Lecture: 3
Problems of collective consumption, external
effects, public investment, social decision-
making and property taxes, and other tax
and non-tax revenue sources. Consideration
of current policy issues and relations among
various levels of government.
Prerequisites: Principles of Microeconomics

ECON 3381 Energy and Environmental
Economics
Lecture: 3
Economic techniques applied to particular issues
of energy markets, environmental impacts,
investment in renewables, and other issues
such as transportation and conservation. Study
includes economics of energy and environmental
regulation such as utility management,
emissions trading markets, and optimal effluent
taxes.
Prerequisites: Principles of Microeconomics

ECON 3391 Sports Economics
Credit: 3 | Lecture: 3
Intercollegiate and professional sports leagues.
Competitive balance, player labor markets,
and owner capital markets. Theories of league
expansion, rival leagues, franchise relocation,
and sports venue finance. Comparisons of
international sports leagues.
Prerequisites: Principles of Microeconomics

EDUC Education

EDUC 1100 Learning Framework
Credit: 3 | Lecture: 3 | Lab: 0
A study of the 1) research and theory in
psychology of learning, cognition, and
motivation 2) factors that impact learning, and
3) application of learning strategies. Theoretical
models of strategic learning, cognition, and
motivation serve as the conceptual basis for the
introduction of college-level student academic
strategies. Students use assessment instruments
(e.g., learning inventories) to help them identify
their own strengths and weaknesses as strategic
learners. Students are ultimately expected
to integrate and apply the learning skills
discussed across their own academic programs
and become effective and efficient learners.
Students developing these skills should be able
to continually draw from the theoretical models
they have learned.

EDUC 3301 Introduction to Educational Statistics
and Measurement
Credit: 3 | Lecture: 3 | Lab: 0
Applications of measurement, correlation,
and descriptive statistics with a focus on
interpretation of standardized tests and surveys.
EDUC 4300 School and Community
Credit: 3 | Lecture: 3 | Lab: 0
Historical, legal and philosophical foundations of education in American society.

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 4389 Independent Studies in Education
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

EDUC 4391 Selected Topics in Education
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered.

ENGR Engineering

ENGR 1201 Introduction to Engineering
Credit: 2 | Lecture: 2
An introduction to the engineering profession with emphasis on technical communication and team-based engineering design.
Prerequisites: MATH 1314 or equivalent.

ENGR 1304 Engineering Graphics I
Credit: 3 | Lecture: 3
Introduction to computer aided drafting using CAD software and sketching to generate two and three-dimensional drawings based on the conventions of engineering graphical communication; topics include spatial relationships, multi-view projections and sectioning, dimensioning, graphical presentation of data and fundamentals of computer graphics.
Prerequisites: MATH 1314 or equivalent.

ENGR 2105 Laboratory for Electrical Circuits I
Credit: 1 | Lecture: 0 | Lab: 3
This laboratory will provide the student hands on experience with linear circuits.
Corequisites: ENGR 2305

ENGR 2301 Statics
Credit: 3 | Lecture: 3
Review of vector methods, static analysis of forces acting on a particle and reduction of forces to equivalent force and couple. Static analysis of rigid bodies, trusses, frames and machines. A grade of “C” or better is required in all prerequisite courses.
Prerequisites: PHYS 2325, PHYS 2125
Corequisites: MATH 2414

ENGR 2302 Dynamics
Credit: 3 | Lecture: 3
Principles of work and energy applied to particles, systems of particles, and rigid bodies. Impulse and momentum methods. Application of Newton's laws to derive equations of motion for particles, rigid bodies and systems. A grade of “C” or better is required in all prerequisite courses.
Prerequisites: ENGR 2301
**ENGR 2304 Computing for Engineers**  
**Credit: 3 | Lecture: 3**  
Introduction to computing; matrix arithmetic, programming constructs, algorithms and graphical visualization using MATLAB; problem solving applications in engineering analysis and design. Prior successful completion of (grade of "C" or better) or concurrent enrollment in MATH 2318 required.  
*Prerequisites: ENGR 1201, MATH 2318.*

**ENGR 2305 Electrical Circuits I**  
**Credit: 3 | Lecture: 3**  
Principles of electrical circuits and systems. Basic circuit elements (resistance, inductance, mutual inductance, capacitance, independent and dependent controlled voltage and current sources). Topology of electrical networks; Kirchhoff’s laws; node and mesh analysis; DC circuit analysis; operational amplifiers; transient and sinusoidal steady-state analysis; AC circuit analysis; first and second order circuits; Bode plots and use of computer simulation software to solve circuit problems. A grade of “C” or better is required in all prerequisite courses.  
*Prerequisites: PHYS 2326, PHYS 2126, MATH 2414  
Corequisites: MATH 2320.*

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**ENSC Environmental Science**

**ENSC 1101 Laboratory for Environmental Science I**  
**Credit: 1 | Lecture: 0 | Lab: 1**  
Laboratory exercises include water, soil and air testing, field sampling and observations. Optional and required field trips. Not for biology or environmental science majors.  
*Corequisites: ENSC 1301*

**ENSC 1102 Laboratory for Environmental Science II**  
**Credit: 1 | Lecture: 0 | Lab: 1**  
Laboratory exercises in environmental quality assessment techniques, field sampling techniques and related studies of local environments. Optional and required field trips. Not for biology or environmental science majors.  
*Corequisites: ENSC 1302*

**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.  
*Corequisites: ENSC 1101*

**ENSC 1302 Environmental Science II**  
**Credit: 3 | Lecture: 3**  
Interdisciplinary study of natural and social sciences and how they apply to the environment, including energy, waste and resource management and global climate change. Not for biology or environmental science majors.  
*Corequisites: ENSC 1102*

**ENSC 2230 Environmental Science Seminar I**  
**Credit: 2 | Lecture: 2**  
Sophomore seminar course, includes journal article critiquing, analyzing data, writing research papers, preparing oral and poster presentations in environmental science.

**ENSC 3301 Energy and the Environment**  
**Credit: 3 | Lecture: 3**  
Introduction to renewable and nonrenewable energy sources and their related impacts on environment. Field trips and laboratory exercises included. Course designed for science majors.
ENSC 3307 Geographic Information Systems
Credit: 3 | Lecture: 3
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.

ENSC 3331 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.

ENSC 3332 Environmental Chemistry
Credit: 3 | Lecture: 3
Chemical processes and reactions related to chemical pollution problems and other control in the atmosphere, soils, water and wastes. Prerequisites: CHEM 1311, CHEM 1312 or equivalent.
Prerequisites: CHEM 1311, CHEM 1312 or equivalent.

ENSC 3333 Environmental Geology
Credit: 3 | Lecture: 3
Relationships between human activities and the geological environment. Includes study of natural hazards, natural resources and waste disposal in the geologic environment. Suitable for non-majors.

ENSC 4130 Environmental Science Seminar II
Credit: 1 | Lecture: 3 | Lab: 1
Senior capstone seminar, library research and writing major review paper with oral presentation.
Prerequisites: ENSC 2230, ENSC 3331, ENSC 3332, ENSC 3333

ENSC 4189 Independent Study in Environmental Science
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

ENSC 4195 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 4225 Environmental Toxicology Laboratory
Credit: 2 | Lecture: 1 | Lab: 3
Theory and practice in environmental toxicity testing of water and soils using EPA standard methods.
Prerequisites: ENSC 4325 or equivalent.

ENSC 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: ENSC 3332

ENSC 4289 Independent Study in Environmental Science
Credit: 2 | Lecture: 2
Prerequisites: Approval of instructor, chair and associate dean.
ENSC 4315 Environmental Science Practicum  
Credit: 3 | Lecture: 3 | Lab: 0  
Practical experience at an on- or off-campus facility. Requires pre-enrollment interview, minimum of 150 hours work, and faculty approval.  
Prerequisites: Junior or senior standing  

ENSC 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: ENSC 3333  

ENSC 4325 Environmental Toxicology  
Credit: 3 | Lecture: 3  
Physiological and systemic effects of exposure to environmental pollutants.  
Prerequisites: BIOL 1306, BIOL 1307 or equivalent; CHEM 2323.  

ENSC 4331 Introduction to Environmental Engineering  
Credit: 3 | Lecture: 3  
Introduction to fundamental science and engineering principles for understanding environmental processes and solving environmental engineering problems. Includes materials and energy balances, water and wastewater treatment, pollution, waste management, sustainability and green engineering. Field trips and lab exercises included.  
Prerequisites: CHEM 1311 and CHEM 1312 or ENSC 1301 and ENSC 1302  

ENSC 4332 Advanced Environmental Science  
Credit: 3 | Lecture: 3  
This course will apply basic science (biology, chemistry, and geology) into the interdisciplinary study of environmental systems. Topics include causes and solutions to land, air, water and ecosystem degradation. The current trend and recent advances in the field of environmental research will be discussed. This course includes lectures, field trips, and reports.  
Prerequisites: ENSC 2230, ENSC 3331, ENSC 3332, ENSC 3333.  

ENSC 4333 Introduction to Global Climate Change  
Credit: 3 | Lecture: 3  
Course introduces and integrates the multidisciplinary science working to understand the behavior of the Earth’s climate. The course investigates the dynamic roles of Earth’s geosphere, cryosphere, hydrosphere, atmosphere, biosphere, orbit and human activities on historical, present and future climates.  

ENSC 4335 Applied GIS  
Credit: 3 | Lecture: 3  
This course emphasizes the use of spatial analysis capabilities in Geographical Information Systems (GIS) in a range of applications. Topics covered include vector, raster and surface analysis, classification methods, interpolation techniques, watershed analysis and 3D visualization.  
Prerequisites: ENSC 3307 or equivalent.
ENSC 4336 Web GIS  
**Credit: 3 | Lecture: 3 | Lab: 0**  
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.  
*Prerequisites: ENSC 3307 or equivalent.*

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.  
*Prerequisites: ENSC 3307 or equivalent.*

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: ENSC 3333*

ENSC 4352 Water Chemistry and Water Pollution  
**Credit: 3 | Lecture: 3**  
Study of chemical equilibria in natural waters, water quality parameters, water sampling, important water pollutants and their fate.  
*Prerequisites: CHEM 1311, CHEM 1312*

ENSC 4355 Environmental Sampling and Monitoring  
**Credit: 3 | Lecture: 3**  
Principles and techniques of environmental sampling for air, water, soil and hazardous wastes. EPA standard methods for environmental analysis using biological, chemical and instrumental techniques.  
*Prerequisites: Junior standing*

ENSC 4356 Soil and 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: ENSC 3333*

ENSC 4379 Internship in Environmental Science  
**Credit: 3 | Lecture: 3**  
Supervised work experience in an approved industrial firm or governmental agency. Written and oral reports required.  
*Prerequisites: 15 hours of upper-level credit; approval of faculty adviser and associate dean.*

ENSC 4389 Independent Study in Environmental Science  
**Credit: 3 | Lecture: 3**  
*Prerequisites: Approval of instructor, chair and associate dean.*
ENSC 4391 Topics in Environmental Science  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

**ENVR Environmental Management**

ENVR 3311 Foundations of Environmental Management  
Credit: 3 | Lecture: 3  
Presentation, analysis and application of the principles of managing human interaction with the environment.

ENVR 4189 Independent Studies in Environmental Management  
Credit: 1 | Lecture: 1  
Independent directed study in Environmental Management.  
*Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.*

ENVR 4311 Principles of Air Quality Management  
Credit: 3 | Lecture: 3  
Analysis of practices and technology for the control of atmospheric pollution.  
*Prerequisites: Introductory chemistry, ENVR 3311 or equivalents.*

ENVR 4312 Water Management Principles  
Credit: 3 | Lecture: 3  
Principles of effective water resources management; national and state water resource practices.  
*Prerequisites: Introductory chemistry, ENVR 3311 or equivalents.*

ENVR 4313 Techniques of Environmental Assessment  
Credit: 3 | Lecture: 3  
Familiarization with and basic critique of environmental impact assessment, environmental auditing and other decision and planning tools.  
*Prerequisites: ENVR 3311 and ENVR 4315 or equivalents.*

ENVR 4315 Introduction to Environmental Law  
Credit: 3 | Lecture: 3  
Application of legal concepts and systems to environmental issues; basic federal and state environmental legislation.

ENVR 4317 Solid Waste Management Practices  
Credit: 3 | Lecture: 3  
A study of the management practices and technology used for non-hazardous solid waste collection, treatment, disposal and reuse.

ENVR 4332 The Process of Environmental Permitting  
Credit: 3 | Lecture: 3  
A practical survey of the permits and procedures used by environmental agencies for regulatory control.

ENVR 4333 Introduction to Pollution Control Technology  
Credit: 3 | Lecture: 3  
An introduction to the technical aspects of pollution control including principles, equipment applications, manpower and energy requirements and economic factors.  
*Prerequisites: ENVR 3311 or equivalent.*
ENVR 4336 Administrative Practice and Ethical Issues
Credit: 3 | Lecture: 3
The study of administrative agencies and their structure and authority; practical considerations when interacting with administrative agencies on environmental issues; ethical issues in environmental management.

ENVR 4379 Internship in Environmental Management
Credit: 3 | Lecture: 3
Supervised field experience with an approved agency or office. Written and oral reports required.
Prerequisites: Prerequisite: Approval of faculty adviser and program director.

ENVR 4389 Independent Studies in Environmental Management
Credit: 3 | Lecture: 3
Independent directed study in Environmental Management.
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

ENVR 4391 Selected Topics in Environmental Management
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

FINC Finance

FINC 3301 Personal Money Management
Credit: 3 | Lecture: 3
Quantitative and qualitative applications of key concepts of individual financial management to essential personal finance topics, including exploration of family budgeting, insurance, taxes, borrowing, saving, investing and retirement and estate planning.
Prerequisites: Must have completed 30 SCH.

FINC 3331 Business Finance
Credit: 3 | Lecture: 3
Fundamental tools and techniques in financial planning; working capital management, capital budgeting; cost of capital; dividend theory, mergers and business failures.
Prerequisites: Principles of accounting (ACCT 2301 and 2302), principles of economics (ECON 2301 and 2302) and DSCI 3321 or equivalent.

FINC 3333 Intermediate Financial Management
Credit: 3 | Lecture: 3
Advanced principles and practices in the financial administration of business enterprises.
Prerequisites: FINC 3331 or equivalent with a C or better.

FINC 3336 Risk Management
Credit: 3 | Lecture: 3
Techniques for managing pure risks for individuals and small businesses, and the characteristics of life, health, and property insurance are studied.
Prerequisites: FINC 3331 or equivalent.
FINC 3351 Real Estate Investment Analysis
Credit: 3 | Lecture: 3
Analytical foundations of evaluating real estate investments and exploration of the methods of financing such investments.  
Prerequisites: ECON 2301 or equivalent

FINC 3353 Investments
Credit: 3 | Lecture: 3
Personal investments in bonds, mortgages, stocks and other securities; financial statements and credit.  
Prerequisites: FINC 3331 or equivalent with a C or better. FINC 3333 or equivalent with C- or better.

FINC 4331 Contemporary Financial Institutions
Credit: 3 | Lecture: 3
Management policies of commercial banks, savings and loan associations, credit unions, finance companies and other financial intermediaries.  
Prerequisites: FINC 3331 or equivalent with a C or better.

FINC 4341 Structure of Financial Statements
Credit: 3 | Lecture: 3
Evaluation of the structure of financial statements and their use in financial decision-making.  
Prerequisites: FINC 3331 or equivalent with a C or better; ACCT 3341 or ACCT 3332 or equivalents with a C- or better.

FINC 4351 International Financial Operations
Credit: 3 | Lecture: 3
International transactions and financial flows; balance of payments, foreign exchange market, worldwide commercial policy and financing.  
Prerequisites: FINC 3331 or equivalent with a C or better.

FINC 4352 Seminar in International Finance
Credit: 3 | Lecture: 3
Field experience involving meetings with financial officers of companies operating outside of the United States. Discussions will involve matters relating to the financing of international business activities and operating in a non-American business environment.

FINC 4353 Financial Derivatives
Credit: 3 | Lecture: 3
Quantitative concepts relating to financial derivatives, including options, futures, forwards, swaps and other securities with a primary emphasis on the valuation of these contracts and how they can be used to manage risk by hedging.  
Prerequisites: FINC 3331 or equivalent with a C or better.

FINC 4356 Income Taxation
Credit: 3 | Lecture: 3
An analysis of the federal income tax laws as they apply to individuals and the financial planning process (Cross-listed with ACCT 4331).  
Prerequisites: FINC 3331 and Principles of Accounting, or equivalents.

FINC 4361 Treasury Management
Credit: 3 | Lecture: 3
Short-term asset and liability management, including the issues essential to the day-to-day management of cash flows associated with the operating cycle of a firm.  
Prerequisites: FINC 3331 or equivalent with a C or better.
FINC 4373 Retirement and Benefits Planning  
Credit: 3 | Lecture: 3  
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: FINC 3331 and FINC 3353 or equivalents.

FINC 4376 Estate Planning  
Credit: 3 | Lecture: 3  
Examination of federal and state laws concerning the distribution of assets in an estate. Significant attention is made to tax minimization strategies.  
Prerequisites: FINC 3331 and FINC 3353 or equivalents.

FINC 4379 Internship in Finance  
Credit: 3 | Lecture: 3  
Six hours of supervised work experience each week in an approved financial institution or firm.  
Prerequisites: 15 hours of upper-level credit and approval of program director.

FINC 4389 Independent Studies in Finance  
Credit: 3 | Lecture: 3  
Independent directed study in Finance.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

FINC 4391 Selected Topics in Finance  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

GEOG Geography

GEOG 1301 Modern Physical Geography  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is designed to provide students with an overview of the natural environment in which we live and the way it functions, at varying scales from local to global. Specifically, it aims to introduce students to important concepts, facts, and terminology of physical geography and impart an appreciation of the interrelationships between humans and their environment.

GEOG 1302 Global Geography  
Credit: 3 | Lecture: 3 | Lab: 0  
A broad survey of the world's major culture regions emphasizing basic physical, cultural, economic, and political patterns, as well as the processes that have created those patterns. Emphasis on economic development, ethnic conflict, and environmental degradation, as well as on the changing role of the United States.

GEOG 1303 World Regional Geography  
Credit: 3 | Lecture: 3 | Lab: 0  
An examination of the world's geographic regions focusing on the location of Earth's major physical features, human populations and cultures, and their interaction. Topics include the cultural landscape, globalization, development, migration, commodity chains, tourism, and the Anthropocene.
GEOG 4300 Geography of North America  
Credit: 3 | Lecture: 3 | Lab: 0  
This course introduces students to the human and physical landscapes of North America as they would be encountered traveling about the continent. It aims to help students understand why landscapes differ from place to place and at the same time provide them with information and insight about what one could expect to find on the landscape, and why.

GEOG 4301 Urban Geography  
Credit: 3 | Lecture: 3 | Lab: 0  
What is the nature of our relationship with cities? Do we control them or do they control us? How are cities shaped by culture, society, economics, politics, and the environment? Why do urban places look the way they do? How did their morphology evolve and change through the millennia? The goal of this course is to answer these questions and other related to the ongoing urbanization of our lives and the earth.

GEOG 4302 Geography of Latin America  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is a general introduction to Latin American and Caribbean environments and peoples from a geographical perspective. The course explores such topics as landforms, climate, environmental hazards, resource management, globalization, population and migration, cities, sustainable development, geopolitics, frontiers, conservation, and cultural survival.

GEOG 4303 Geography of Texas  
Credit: 3 | Lecture: 3 | Lab: 0  
This course explores the geography of Texas. Topics include: past and current physical and biotic environments; ethnic origins, human ecology; and the social, economic and political sources of environmental problems.

GEOG 4306 Service Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
Service Learning is a course designed for students to take an active part in organized experiences that meet actual community needs combined with academic instruction, focusing on critical, reflective thinking and personal and civic responsibility. This course will involve students in activities that address community-identified needs with service integrating academic skills.

GEOG 4311 Historical Geography  
Credit: 3 | Lecture: 3 | Lab: 0  
An introduction to historical geography as a subfield of geography with an emphasis on the evolving patterns of land use and settlement in the United States from the pre-colonial period to the present.

GEOG 4312 Human Geography  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of the importance of human/environment relationships to a global society. Focuses on the world distribution of natural and human resources as they interrelate and provide character to places.
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 4321 Fundamentals of Geographic Information Systems  
Credit: 3 | Lecture: 0 | Lab: 3  
In this introductory course, students become familiar with the concepts and gain the experience necessary to appreciate the utility of Geographic Information Systems in decision-making. Topics include the fundamentals of data structures, georeferencing, data classification, querying, cartography, web GIS, and basic spatial data analysis. The course provides an overview of the capabilities of GIS software and applications of GIS. Class time is divided between lectures and GIS exercises that reinforce critical concepts. Interdisciplinary examples and assignments are drawn from the social and natural sciences.

GEOG 4323 Geographic Information Systems Design and Implementation  
Credit: 3 | Lecture: 0 | Lab: 3  
This course teaches GIS design, project management and communication skills and an appreciation of the ethical, legal and social issues surrounding maps, GIS and geographical data. Students engage in exercises that spans the entire range of GIS design and implementation: from problem inception to solution testing  
Prerequisites: GEOG 4322

GEOG 4379 Internship in Geography  
Credit: 3 | Lecture: 0 | Lab: 0  
Provides supervised professional experience in public and private sector positions and is intended to introduce students to the skills and working environments of careers in geography. Students are required to consult with a geography faculty member before registering for this class.

GEOG 4389 Independent Study in Geography  
Credit: 3 | Lecture: 0 | Lab: 0  
Allows the student to pursue topics not offered in the course catalog through in-depth coursework under the direction of an instructor. This course may include directed readings, coverage of special topics, and other independent study. The topic and scope of study, learning objectives, work required, methods of evaluation, and academic level will be determined in conference between the student and instructor.

GEOG 4391 Selected 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 1103 Laboratory for Physical Geology  
Credit: 1 | Lecture: 0 | Lab: 1  
Hands-on identification of common rocks and minerals; analysis of geological processes associated with different environments.  
Corequisites: GEOL 1303
GEOL 1104 Laboratory for Historical Geology  
**Credit: 1 | Lecture: 0 | Lab: 1**  
Laboratory activities will introduce methods used by scientists to interpret the history of life and major events in the physical development of Earth from rocks and fossils.  
*Corequisites: GEOL 1304*

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.  
*Corequisites: GEOL 1103*

GEOL 1304 Historical Geology  
**Credit: 3 | Lecture: 3**  
A study of the geologic history of the earth. Topics include the geologic processes and principles that have shaped our planet including plate tectonics, geological age dating ancient depositional environments and the preservation of fossils.  
*Corequisites: GEOL 1104*

GEOL 3117 Laboratory for Mineralogy and Petrology  
**Credit: 1 | Lecture: 0 | Lab: 1**  
Hand specimen and optical characterization and interpretation of minerals and rocks. Field trips may be required.  
*Corequisites: GEOL 3317*

GEOL 3240 Geological Field Methods  
**Credit: 2 | Lecture: 2**  
Collection of field data, interpretation and construction of geologic and topographic maps and examination of petrologic systems. Field trips required.

GEOL 3304 Planetary Geology  
**Credit: 3 | Lecture: 3**  
Study of the origins and evolution of Earth, Mercury, Venus, Mars and the Moon. Physical processes essential to understanding geology are stressed. Laboratory exercises included.  
*Prerequisites: GEOL 1303 or ASTR 1304.*

GEOL 3305 Fundamentals of Earth Science  
**Credit: 3 | Lecture: 3**  
Study of basic physical and chemical processes that operate within the geosphere, atmosphere, hydrosphere, solar system and universe. Natural and anthropogenic factors that affect global climate change are also studied. Suitable for non-majors.

GEOL 3317 Mineralogy and Petrology  
**Credit: 3 | Lecture: 3**  
Formation, identification and geologic and economic significance of minerals and igneous, metamorphic and sedimentary rocks. Field Trips Required.  
*Prerequisites: GEOL 1303 and GEOL 1103, or ENSC 3333*  
*Corequisites: GEOL 3117*

GEOL 4145 Lab for Structural Geology  
**Credit: 1 | Lecture: 0 | Lab: 1**  
Laboratory for the analysis of rock the geometry, kinematics and mechanics of rock deformation as a result of tectonic processes. Field trips required.  
*Corequisites: GEOL 4345*

GEOL 4189 Independent Study in Geology  
**Credit: 1 | Lecture: 1**  
*Prerequisites: Approval of instructor, chair and associate dean*
GEOL 4191 Selected Topics in Geology
Credit: 1 | Lecture: 1
Identified by specific title each time course is offered.

GEOL 4291 Selected Topics in Geology
Credit: 2 | Lecture: 2 | Lab: 0
Identified by specific title each time course is offered.

GEOL 4311 Geology of Texas
Credit: 3 | Lecture: 3
Geological evolution of Texas including physiographic provinces, landforms and subsurface structure. Field trips required.

GEOL 4317 Advanced Mineralogy and Petrology
Credit: 3 | Lecture: 3
Formation, identification and geologic and economic significance of minerals and igneous, metamorphic and sedimentary rocks. Application of modern laboratory methods to the study of rocks and minerals including optical microscopy. Laboratory exercises included.
Prerequisites: GEOL 3317.

GEOL 4324 Geomorphology
Credit: 3 | Lecture: 3
Origin and evolution of landforms; geomorphic cycles, physiographic provinces, application of maps, aerial photographs and quantitative methods to geomorphology. Laboratory exercises included.
Prerequisites: GEOL 1303.

GEOL 4325 Sedimentation and Stratigraphy
Credit: 3 | Lecture: 3
Origins, depositional environments and internal structures of sedimentary rocks. Principles of stratigraphy and bio-stratigraphy, evolution of modern stratigraphic nomenclature. Field trips required.
Prerequisites: GEOL 1303, GEOL 1304

GEOL 4326 Oceanography
Credit: 3 | Lecture: 3
The course emphasizes the application of geologic principles to the study of the marine environment and associated physical, chemical and biological processes. Topics covered include coastal processes, ocean resources, ocean management and human interaction with oceans.
Prerequisites: GEOL 1303 or ENSC 3333

GEOL 4327 Natural Disasters
Credit: 3 | Lecture: 3
This course studies the topics of mass wasting, flooding, earthquakes, hurricanes and others, and evaluates various natural disaster data and statistics. It provides a forum to discuss, describe and improve our understanding of human interactions with the physical environment.
Prerequisites: GEOL 1303 or ENSC 3333

GEOL 4345 Structural Geology
Credit: 3 | Lecture: 3
Description, interpretation, and classification of geologic structures and their origin.
Prerequisites: GEOL 1303
Corequisites: GEOL 4145
GEOL 4375 Petroleum Geology  
Credit: 3 | Lecture: 3  
This course studies the topics of the "petroleum system", origin and migration of hydrocarbons, reservoirs, traps and seals, sedimentary basins and some of the most commonly used methods in exploration and development.  
Prerequisites: GEOL 1303

GEOL 4379 Internship in Environmental Geology  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved private firm or government agency. Written and oral reports required.

GEOL 4389 Independent Study in Geology  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean

GEOL 4391 Selected Topics in Geology  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

HADM Healthcare Administration

HADM 3311 Foundations of Healthcare Administration Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
The administration of health care services and basic principles of organization for patient care including financial, manpower and systems development and control considerations in meeting health requirements at community, state, regional and national levels. This course is also an examination of leadership in healthcare administration.

HADM 3322 Financial Dimensions of Healthcare Administration I  
Credit: 3 | Lecture: 3  
This course is designed to teach the student the ability to understand and analyze the financial performance of healthcare organizations and various techniques associated with financial decisions required in the operation of various healthcare entities. Also, the student shall learn the various aspects of finance which determines the financial results of a healthcare organization.

HADM 3333 Healthcare Economics  
Credit: 3 | Lecture: 3  
This course is designed to familiarize the students with the institutional features and the current trends in the rapidly changing healthcare market. Students will learn to apply the basic tools of microeconomics to issues in healthcare policy and management. Economic concepts relevant for healthcare managers will be examined such as analysis of demand and supply of healthcare goods and services; the role of health insurance and healthcare financing; market failure and the need for government intervention in healthcare markets; and initiatives to improve population health.
HADM 3351 Physician Group Practice Management
Credit: 3 | Lecture: 3
Acquaints the student with the management issues of physician group practice, including insurance billing, personnel management, marketing, patient relations, financial management, venture planning, risk management, retirement planning, physician agreements, practice valuation, managed care, Medicare/Medicaid and legal/tax/professional liability.
Prerequisites: HADM 3311 or equivalent.

HADM 4312 Healthcare Planning and Marketing
Credit: 3 | Lecture: 3
A review of concepts of planning and marketing and their application to the delivery of health care, assessment of community health needs and resources planning in an ambulatory or clinical environment.
Prerequisites: HADM 3311 and MKTG 3301, or equivalents.

HADM 4316 Medical Reimbursement
Credit: 3 | Lecture: 3
Acquaints the student with medical terminology, procedure coding, diagnosis coding, medical management and documentation.
Prerequisites: HADM 3311 or equivalent.

HADM 4317 Healthcare Ethics, Values, and Social Responsibilities
Credit: 3 | Lecture: 3
This course provides the student exposure to ethical issues in healthcare administration as well as business ethics, biomedical and research ethical issues, services to be offered, and distribution and allocation of resources. Additionally, this course will address important ethical issues and problems facing the U.S. health system.

HADM 4318 Managed Care
Credit: 3 | Lecture: 3
Acquaints the student with managed care terminology, contracting for providers and payors, utilization review, case management, direct contracting, benefits structuring and organization structure.
Prerequisites: HADM 3311 or equivalent.

HADM 4326 Hospital Operations
Credit: 3 | Lecture: 3
Concepts and methods needed to operate in a hospital. It will also provide an understanding of the impact of licensing, regulation, finance and billing, supply, operation, the different professions, risk management, compliance, engineering and physical plant, and labor relations activities in healthcare institutions, with an emphasis on organization, effectiveness, productivity and profitability.
Prerequisites: HADM 3311 or equivalent.
HADM 4332 Legal Dimensions of Healthcare Administration
Credit: 3 | Lecture: 3
Legal aspects of the doctor-patient-nurse-other health professional relationships; individual, corporate and institutional liability and responsibility.
Prerequisites: HADM 3351 or equivalent.

HADM 4341 HR in Healthcare Administration
Credit: 3 | Lecture: 3
Concepts and methods needed to plan, forecast, recruit, train, develop, maintain and evaluate health manpower.
Prerequisites: HADM 3311 or equivalent

HADM 4343 Introduction to Public Health
Credit: 3 | Lecture: 3
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 U.S. 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 4351 Financial Dimensions of Healthcare Administration II
Credit: 3 | Lecture: 3
Analysis of the financial framework within which health care organizations and facilities operate, sources and flow of funds, cost information systems and capital budgeting.
Prerequisites: FINC 3331 and HADM 3311, or equivalents.

HADM 4379 Internship in Healthcare Administration
Credit: 3 | Lecture: 3
Supervised field experience with an approved public or private health facility or physician clinic.
Prerequisites: HADM 4316 and approval of program director.

HADM 4389 Independent Studies in Healthcare Administration
Credit: 3 | Lecture: 3
Independent directed study in Healthcare Administration.
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

HADM 4391 Selected Topics in Healthcare Administration
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

HIST History

HIST 1301 United States History I
Credit: 3 | Lecture: 3 | Lab: 0
A survey of the social, political, economic, cultural, and intellectual history of the United States from the pre-Columbian era to the Civil War/Reconstruction period. Includes the study of pre-Columbian, colonial, revolutionary, early national, slavery, sectionalism, and the Civil War/Reconstruction eras. Themes may include: American settlement and diversity, American culture, religion, civil and human rights, technological change, economic change, immigration and migration, and creation of the federal government.
HIST 1302 United States History II  
Credit: 3 | Lecture: 3 | Lab: 0  
A survey of the social, political, economic, cultural, and intellectual history of the United States from the Civil War/Reconstruction era to the present. Examines industrialization, immigration, world wars, the Great Depression, Cold War and post-Cold War eras. Themes may include: American culture, religion, civil and human rights, technological change, economic change, immigration and migration, urbanization and suburbanization, the expansion of the federal government, and the study of U.S. foreign policy.

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 2321 World Civilization I  
Credit: 3 | Lecture: 3 | Lab: 0  
A survey of the social, political, economic, cultural, religious, and intellectual history of the world from the emergence of human cultures through the 15th century. The course examines major cultural regions of the world in Africa, the Americas, Asia, Europe, and Oceania and their global interactions over time. Themes include the emergence of early societies, the rise of civilizations, the development of political and legal systems, religion and philosophy, economic systems, and trans-regional networks of exchange. The course emphasizes the development, interaction, and the impact of global exchange.

HIST 2322 World Civilization II  
Credit: 3 | Lecture: 3 | Lab: 0  
A survey of the social, political, economic, cultural, religious, and intellectual history of the world from the 15th century to the present. The course examines major cultural regions of the world in Africa, the Americas, Asia, Europe, and Oceania and their global interactions over time. Themes include maritime exploration and transoceanic empires, nation/state formation and industrialization, imperialism, global conflicts and resolutions, and global economic integration. The course emphasizes the development, interaction and impact of global exchange.

HIST 3301 Ancient World  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of the development of early civilizations from Mesopotamia and Egypt through Greece and the fall of Rome in the West.
HIST 3303 Ancient Greece
Credit: 3 | Lecture: 3 | Lab: 0
A study of classical Greece with particular attention to cultural, social, and political developments.

HIST 3305 Ancient Rome
Credit: 3 | Lecture: 3 | Lab: 0
Intellectual, social, political, and cultural developments in the history of the ancient Roman Republic and Empire (c.300 B.C.E. to 476 C.E.).

HIST 3307 Medieval Europe
Credit: 3 | Lecture: 3 | Lab: 0
The birth and first flowering of a truly European civilization, urban society, and an agricultural economy.

HIST 3309 Renaissance and Reformation
Credit: 3 | Lecture: 3 | Lab: 0
Economic, political, intellectual, and religious developments in Europe from 1300 to 1600.

HIST 3311 Revolutionary Europe
Credit: 3 | Lecture: 3 | Lab: 0
The Scientific Revolution and Enlightenment tradition, the French and Industrial Revolutions, the birth of ideologies, and state building.

HIST 3313 Modern Europe
Credit: 3 | Lecture: 3 | Lab: 0
An examination of the major developments within European culture, politics, society, and thought since 1815.

HIST 3316 Historical Studies
Credit: 3 | Lecture: 3 | Lab: 0
Introduction to the History major. Focus on developing analytical skills reading both historical documents and scholarship written by historians.

HIST 3317 Introduction to Latin American History
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the history of Latin America from c. 1500 to the present. Introduces Latin American history.

HIST 3319 Colonial Latin America
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the history of Latin America during period of indigenous self-rule and colonial period.

HIST 3321 Modern Latin America
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the development of Latin America from 19th century to the present.

HIST 3323 History of Mexico
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the history of Mexico from Spanish conquest to the present.

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 3329 Antebellum America  
Credit: 3 | Lecture: 3 | Lab: 0  
A study of the United States from 1820 to 1860 with special emphasis on social and political developments.

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 3333 Growth of Industrial America  
Credit: 3 | Lecture: 3 | Lab: 0  
Early growth of industrial capitalism and America’s social and political response to it from the Civil War to World War I.

HIST 3335 U.S. in the Roaring 1920s  
Credit: 3 | Lecture: 3 | Lab: 0  
Examines the modern transformation of the U.S. in this dynamic era through exploration of Prohibition, urban life, consumer culture, and a booming economy headed for collapse.

HIST 3337 U.S. during the Cold War  
Credit: 3 | Lecture: 3 | Lab: 0  
Focus on U.S. Cold War political history and domestic upheavals of the 1960s and 1970s.

HIST 3340 Women in European History  
Credit: 3 | Lecture: 3 | Lab: 0  
The psychological, social, and economic forces that contributed to the subordinate status of women in European society and an examination of feminist responses. Women’s Studies Course.

HIST 3341 Women in American History  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of diversity within the historical gender-specific experience of women's participation in and contributions to the history of the United States. (Cross-listed with WGST 3341.)

HIST 3342 Introduction to Native American History  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of the history of Native Peoples in North America from the arrival of humans on the continent through the 20th century.

HIST 3345 Reel America I  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis of films and historical materials from the first half of the 20th century. Focus on cultural and social history. May include Women's Studies content.

HIST 3347 Reel America II  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis of films and historical material since 1945. Focus on cultural and social history. May include Women’s Studies content.

HIST 3349 Modern Middle East  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to the history of the Middle East with a focus on the modern period and critically exploring the roots and development of modern conflicts in the region.

HIST 4301 Studies in European History  
Credit: 3 | Lecture: 3 | Lab: 0  
Surveys important topics in European history. Topics vary; may be repeated for credit with permission of instructor.
HIST 4303 Reel Europe
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the cultural movements and political developments in European film. Film analysis will use historical documents, fiction, and political manifestos to understand cultural history.

HIST 4305 Nazi Cinema and Third Reich
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of the Third Reich through film and cultural artifacts and the concept of emotional engineering, juxtaposing recreation with complements of law and order.

HIST 4307 Holocaust: History, Literature, and Film
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the Holocaust from historical, psychological, and sociological perspectives.

HIST 4308 The Mexico Borderlands
Credit: 3 | Lecture: 3 | Lab: 0
Examination of Mexico's northern borderlands from Spanish settlement in the sixteenth century to the present. Explores the evolution of the region, and its impact on Mexico's development.

HIST 4309 Studies in Latin American History
Credit: 3 | Lecture: 3 | Lab: 0
Survey of important issues and regions in Latin America. Topics vary; may be repeated for credit with permission of instructor.

HIST 4310 Latin America and the United States
Credit: 3 | Lecture: 3 | Lab: 0
Explores the complex relationship between Latin America and the United States over the two centuries between 1800 and 2000.

HIST 4311 Studies in Native American History
Credit: 3 | Lecture: 3 | Lab: 0
Surveys important topics in Native American History. Topics vary; may be repeated for credit with permission of instructor.

HIST 4312 Studies in Early American History
Credit: 3 | Lecture: 3 | Lab: 0
Surveys important topics in early American history from the 15th through 18th centuries. Topics vary: may be repeated for credit with permission of instructor.

HIST 4313 Studies in U.S. History
Credit: 3 | Lecture: 3 | Lab: 0
Surveys important topics in United States history. Topics vary; may be repeated for credit with permission of instructor.

HIST 4315 Studies in African American History
Credit: 3 | Lecture: 3 | Lab: 0
Surveys important topics in African American history. Topics vary; may be repeated for credit with permission of instructor.

HIST 4318 The Salem Witchcraft Crisis
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the origins, progress, and outcomes of the witchcraft crisis that overwhelmed Salem, Massachusetts in 1692.

HIST 4319 U.S. Labor History
Credit: 3 | Lecture: 3 | Lab: 0
Major changes in the U.S. economy, production technology, and social movements rooted in workplaces from the 19th century to the present.
HIST 4321 The U.S. and World War II
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the role of the U.S. in World War II and exploration of the nature of combat, the home front, and cultural remembrance.

HIST 4323 The Vietnam War in Film
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the Vietnam War in U.S. film. Consists of class discussion drawn from film, memoirs, popular culture, and historical background. Traces intersection of fact and fiction following the Vietnam War.

HIST 4325 Studies in Middle Eastern History
Credit: 3 | Lecture: 3 | Lab: 0
Surveys important topics in Middle Eastern history. Topics vary; may be repeated for credit with permission of instructor.

HIST 4326 Middle East and the United States
Credit: 3 | Lecture: 3 | Lab: 0
Surveys major political, socioeconomic, and cultural changes in the relationship between the Middle East and the West from the rise of Islam to the present with an emphasis on Islam's encounter with the United States.

HIST 4328 Palestinian–Israeli Conflict
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of the roots of the Palestinian–Israeli conflict through a comprehensive and critical survey of its historical, religious, and political background as well as elusive resolution.

HIST 4329 History of Feminism
Credit: 3 | Lecture: 3 | Lab: 0
A survey of the development of those reform movements and individuals shaping the growth of feminism in the 19th- and 20th-century U.S. and the world. May focus on a particular aspect of historical feminism. Topics vary; may be repeated for credit with permission of instructor. Women's Studies Course. (Cross-listed with WGST 4329.)

HIST 4391 Selected 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.

HLTH Fitness and Human Performance

HLTH 2110 Team Games and Sports
Credit: 1 | Lecture: 1 | Lab: 0
Practical-based instruction, skill learning, demonstration, rules, and organizations of various team sports used to promote activity in secondary physical education classes.

HLTH 2113 Individual Games and Sports
Credit: 1 | Lecture: 1 | Lab: 0
Practical-based instruction, skill learning, demonstration, rules, and organizations of various individual sports used to promote activity in secondary physical education classes.

HLTH 2115 Innovative Games and Sports
Credit: 1 | Lecture: 1 | Lab: 0
Practical-based instruction, skill learning, demonstration, rules, and organizations of unique or non-traditional games and sports used to promote activity in secondary physical education classes.
HLTH 2301 Introduction to Exercise Science  
Credit: 3 | Lecture: 3 | Lab: 0  
An introduction to the primary and secondary disciplines within exercise and health science with particular emphasis on early career development, goals, and academic planning.

HLTH 2303 Personal Health and Fitness  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to the key components of a healthy lifestyle including nutrition, exercise, behavioral modification, and physical activity. Course will include lecture and activity-based learning.

HLTH 3301 Health, Emergency Care and First Aid  
Credit: 3 | Lecture: 3 | Lab: 0  
Emergency care for victims of sudden illness or injury; etiology of accidents; current safety concerns and practices. Basic Red Cross and CPR competencies.

HLTH 3302 Health and Physical Education - EC-6 Survey  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of the health and physical education information required by core subjects EC-6 teacher. Covers specific material from the Texas State Board for Educator Certification and prepares students for certification exams.

HLTH 3303 Nutrition and Weight Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of relationship among nutrition, exercise, and weight control and their role in health and performance. Techniques for dietary analysis.

HLTH 3304 Principles of Physical Fitness  
Credit: 3 | Lecture: 3 | Lab: 0  

HLTH 3309 Evidence-Based Practice  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to the philosophy and methodology of evidence-based practice with a particular emphasis on critically appraising and integrating research findings into exercise prescriptions.

HLTH 3315 Health Promotion Programs  
Credit: 3 | Lecture: 3 | Lab: 0  
The purposes, methods, and objectives of health promotion programs in business and industry.

HLTH 3316 Applied Kinesiology  
Credit: 3 | Lecture: 3 | Lab: 0  
The study of functional anatomy with relevance to the kinesiology of exercise, exercise movements, and sports participation.

HLTH 3317 Motor Development and Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
Fundamental principles associated with motor development, task-based/skill proficiency, and movement activities in learning environments for children and adults.

HLTH 3318 Introduction to Community Health  
Credit: 3 | Lecture: 3 | Lab: 0  
Provides a broad overview of community health with emphasis on governmental organizations that influence public health, epidemiology, community organization and health planning.
HLTH 3319 Introduction to Public Health  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will present an introduction to major issues of health and health care in the United States – what they are, what determines them, and how they can be altered. Topics covered include: an introduction to the history, science and principles of public health, principles and tools of evidence-based public health, and an overview of the US health care system.

HLTH 3320 Health Inequalities  
Credit: 3 | Lecture: 3 | Lab: 0  
Focuses on racial/ethnic and socioeconomic disparities including how income, education, neighborhood conditions, access to health care, and other community factors shape health opportunities.

HLTH 4301 Physiology of Exercise  
Credit: 3 | Lecture: 3 | Lab: 0  
Study of the physiological bases of exercise with emphasis on the adaptation of the systems of the body to stress.

HLTH 4302 Biomechanics  
Credit: 3 | Lecture: 3 | Lab: 0  
Biomechanical analysis of human motion based on anatomical, physiological, and mechanical principles. Role of mechanics in human performance. A background in algebra and trigonometry is recommended.

HLTH 4305 Seminar in Sports Medicine  
Credit: 3 | Lecture: 3 | Lab: 0  
Approaches to injury prevention by conditioning and utilization of proper equipment. Diagnosis and rehabilitation of common sports injuries. Laboratory exercises.

HLTH 4307 Peak Performance  
Credit: 3 | Lecture: 3 | Lab: 0  
How to improve performance by enhancing strength, flexibility, speed, power, agility, and coordination.

HLTH 4308 Resistive Exercise: Theory and Practice  
Credit: 3 | Lecture: 3 | Lab: 0  
Laboratory and lecture activities relating to appropriate training techniques for traditional, Olympic, and rehabilitative strength exercises. The development of advanced periodization models.

HLTH 4309 Research Practicum  
Credit: 3 | Lecture: 0 | Lab: 0  
An introduction to human subject research, including data collection, reduction, and analysis. Students will participate in abstract and manuscript preparation. 
Prerequisites: HLTH 4370, Instructor permission required.

HLTH 4311 Methods in Physical Education I  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to instructional concepts, methods, and technologies in teaching and administering secondary-level physical education programs.

HLTH 4312 Methods in Physical Education II  
Credit: 3 | Lecture: 3 | Lab: 0  
Advanced instructional concepts, methods, and technologies in teaching and administering secondary-level physical education programs.
HLTH 4370 Undergraduate Practicum  
Credit: 3 | Lecture: 0 | Lab: 0  
The application of test procedures utilized for general fitness assessment testing. Permission of instructor required. Prerequisite: HLTH 4301  
Prerequisites: HLTH 4301

HLTH 4379 Internship  
Credit: 3 | Lecture: 0 | Lab: 0  
Work–related learning experience in the application of exercise health promotion programs to teaching, clinical or research activities. Permission of instructor required.  
Prerequisites: Completion of or concurrent enrollment in HLTH 3303, HLTH 3304, HLTH 4301, HLTH 4302, HLTH 4305, HLTH 4308, and HLTH 4370

HLTH 4389 Independent Study in Health  
Credit: 3 | Lecture: 0 | Lab: 0  
Prerequisite: Approval of independent study director. Individual projects and activities in development of skills related to health.

HLTH 4391 Selected Topics in Health  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

HUMN Humanities  

HUMN 1301 Humanities  
Credit: 3 | Lecture: 3 | Lab: 0  
An interdisciplinary, multi-perspective assessment of cultural, political, philosophical, and aesthetic factors critical to the formulation of values and the historical development of the individual and of society.

HUMN 3350 Art 1900–1950  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course examines the art of Europe, the United States, and Latin America in the first half of the twentieth century. Significant topics include the birth and growth of modernism, the impact of the world wars on the artistic communities of the regions studied, and major movements such as Cubism, Dadaism, Fauvism, Impressionism, and Surrealism.

HUMN 3351 Art 1950–Present  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course examines the art of Europe, the United States, and Latin America in the first half of the twentieth century. Significant topics include art in the aftermath of World War II, conceptualism, performance art, video art, feminist art, and the contemporary art market. (Cross-listed with ARTS 3351.)

HUMN 3355 Latin American Art of the Twentieth Century  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course will examine the art of 20th century Latin America through a series of major modern art centers, including Mexico City, Havana, Buenos Aires, Rio de Janeiro, Bogota, and Caracas. (Cross-listed with ARTS 3355.)

HUMN 3356 Mexican Art, 1500–Present  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course will explore the history of visual art in Mexico beginning with the period of encounter between native populations of that region of the Americas and the European explorers who arrived in the Americas in the late 15th century and continuing through the colonial, independence, and modern era. (Cross-listed with ARTS 3356.)
HUMN 3357 History and Theory of Photography  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. Study of history and function of photography from its development in the fine arts to present-day significance of mechanical and digital reproduction. (Cross-listed with ARTS 3357.)

HUMN 3374 Critical Inquiry  
Credit: 3 | Lecture: 3 | Lab: 0  
Students will engage in critical research in contemporary humanities that attends to diverse scholarship on race, class, gender, and ethnicity. Students will emerge from course equipped with current knowledge on theorizing selfhood, community, and/or culture.

HUMN 3375 Ideas in Transition  
Credit: 3 | Lecture: 3 | Lab: 0  
This class traces an idea’s shifting significance throughout history. Themes will be studies using philosophic, literary, and artistic works. Themes may include soul–brain–machine, sex and love, gender, justice, economy and society, technology, identity and community. Topics vary; may be repeated for credit in the same or subsequent semesters. Different topics might be counted toward different concentrations for HUMN students. Refer to the Concentration areas in the Humanities B.A. section of the catalog.

HUMN 4308 Perspectives in Women’s and Gender Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
General information on the wide range of issues related to the status of women. Women’s Studies Course. (Cross-listed with PSYC 4308.)

HUMN 4312 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 4312.)

HUMN 4315 Art of the Ancient Greek World  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. The art, history, and culture of the ancient Greek world from the Bronze Age through the Hellenistic period. Topics include appropriation, cultural heritage, and gender studies. (Cross-listed with ARTS 4315.)

HUMN 4322 Roman Art  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. 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. (Cross-listed with ARTS 4322.)

HUMN 4326 Studies in Film  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of film texts from a topical, generic, or historical perspective. Includes introduction to theory. Topics vary; may be repeated for credit with permission of instructor.
HUMN 4364 Museum Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course introduces students to the theory and operations of fine arts museums, including strategies of display, collection management, accessions, and public relations. The course will include visits to local gallery and museum spaces. (Cross-listed with ARTS 4364.)

HUMN 4366 Propaganda and Persuasive Images  
Credit: 3 | Lecture: 3 | Lab: 0  
Art History. This course examines the theory and use of propagandistic and persuasive imagery with particular focus on the twentieth century. This propaganda of World War II will comprise a major unit, as well study of modern photomanipulation and advertising strategies. (Cross-listed with ARTS 4366.)

HUMN 4372 Seminar in Women's Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
An advanced course in Women's Studies, designed to acquaint the student with contemporary issues in feminist scholarship across the disciplines. Prerequisite: Any previous Women's Studies course. (Cross-listed with HUMN 5732, PSYC 4372, and PSYC 5732.)  
Prerequisites: Any previous Women's Studies course.

HUMN 4389 Independent Study in Humanities  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

HUMN 4391 Selected 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.

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 4355 eLearning  
Credit: 3 | Lecture: 3 | Lab: 0  
Apply internet knowledge and skills to design and develop learning environments on the internet. Apply current research-based strategies for effective web-enhanced learning and the assessment of that learning. Demonstrate safe, legal and healthy use of the internet.  
Prerequisites: Basic computer literacy.

INST 4357 Multimedia for Instruction  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduces students to topics of multimedia for the web. Students will learn how to plan a multimedia web site and design the user interface. Focus is on five multimedia elements: text, graphics, animation, sound, and video. Participants will design multimedia elements appropriate for integration in online learning environments.
INST 4365 Web Development
Credit: 3 | Lecture: 3 | Lab: 0
Examines the design, development and distribution of electronic documents. Participants will learn the basic components of how web documents are created, various design approaches for a variety of user-friendly tools for web page development, how to include eye-catching graphics, interactive multimedia components and sophisticated programming in a web page.
Prerequisites: Basic computer literacy.

INST 4389 Independent Study in Instructional Technology
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

INST 4391 Selected Topics in Instructional Technology
Credit: 3 | Lecture: 3 | Lab: 0
Identified by title each time course is offered.

ISAM Information Systems Administration and Management

ISAM 1305 Business Computer Applications
Credit: 3 | Lecture: 3
Computer terminology, hardware, software, operating systems and information systems relating to the business environment. The main focus of this course is on business applications of software, including word processing, spreadsheets, databases, presentation graphics and business-oriented utilization of the internet.

ISAM 3303 Information Systems for Management
Credit: 3 | Lecture: 3
Fundamentals of information systems to assist management in the operation and control of complex organizations. Includes IS for decision making and problem solving, IS for competitive advantage, enterprise resource planning systems and database processing. Course contains numerous hands-on, business-oriented IS projects.
Prerequisites: ISAM 1305 or equivalent.

ISAM 3304 Introduction to Business Applications Programming
Credit: 3 | Lecture: 3
This course covers fundamental concepts used in the design and development of business applications. It describes program methodologies, control techniques and the development of programs using a high-level business-oriented programming language. Includes numerous hands-on assignments.

ISAM 3314 Applications Development with Java
Credit: 3 | Lecture: 3
The course covers the development of Java applications/applets running in the Java Runtime Environment. It demonstrates important object-oriented programming concepts such as data abstraction, encapsulation, polymorphism and inheritance. Includes numerous hands-on assignments.
Prerequisites: ISAM 3304 or equivalent.
ISAM 3331 Introduction to Business Database Applications Development
Lecture: 0 | Lab: 1
Overview of database concepts and techniques (database models, modeling techniques, normalization, etc.) used in the design of business databases. The course covers development, manipulation and maintenance of a business database (such as sales, inventory, customer, employee, etc.) with a relational database management system. Includes numerous hands-on class assignments.
Prerequisites: ISAM 3303 or equivalent.
Corequisites: ISAM 3303 or equivalent

ISAM 3333 Applications Development with C#
Credit: 3 | Lecture: 3
The course covers graphical user interface concepts and programming constructs related to object-oriented programming, exception handling, forms, multidimensional arrays, and data extrapolation. Includes numerous hands-on assignments.
Prerequisites: ISAM 3304 or equivalent.

ISAM 4331 Introduction to Business Internet Applications Development
Credit: 3 | Lecture: 3
The role of internet, intranets, and internet tools in business; design and development of business-oriented web applications using modern web technology standards, languages, and tools. Includes numerous hands-on assignments.
Prerequisites: ISAM 3304 or equivalent.

ISAM 4332 Advanced Business Internet Applications Development
Credit: 3 | Lecture: 3
An advanced-level course on the design and development of Internet applications using modern Web technology standards, languages, and tools. Topics include client-side scripts, server-side processing, Web forms processing, use of databases, and dynamic Web applications. Includes numerous hands-on assignments. The course includes completion of a professional certification in Internet Application Development.
Prerequisites: ISAM 3331, 3332, 4331 or equivalents.

ISAM 4360 Advanced Business Spreadsheet Applications Development
Lecture: 3
This course covers advanced topics related to the design, development and maintenance of a business spreadsheet application. These topics include the following: advanced techniques for working with formulas, functions and formatting; what-if analysis, creating charts and working with multiple worksheets; creating, sorting and querying a table; working with SmartArt and Images, etc. Includes numerous hands-on assignments. Coursework requirements include Microsoft Excel certification exam.
Prerequisites: ISAM 3303 or equivalent.
ISAM 4362 Advanced Business Database Applications Development
Lecture: 0 | Lab: 1
This course covers advanced topics related to the design, development and maintenance of a business database application. Also covered are advanced techniques for query formulation, information retrieval and report generation. Includes numerous hands-on assignments. Coursework requirements include Microsoft ;MySQL; certification exam. 
Prerequisites: ISAM 3331 or equivalent

ISAM 4365 Analysis and Design of Information Systems
Credit: 3 | Lecture: 3
This course covers the systems development life cycle, systems development methodologies, systems requirement analysis, user interface designs, program design methodologies, and system architecture. Includes hands-on assignments using computer-aided software engineering and project management tools. 
Prerequisites: ISAM 3331 or equivalent.

ISAM 4366 Introduction to Computer Networks Management
Credit: 3 | Lecture: 3
The course covers network hardware, software, protocols and administration. It includes internetworking, TCP/IP protocols, IP addressing, routing, and network switching. Includes numerous hands-on assignments. 
Prerequisites: ISAM 3303 or equivalent.

ISAM 4367 Advanced Computer Network Protocols
Credit: 3 | Lecture: 3
This course covers advanced networking topics such as VLANs, spanning tree protocol, routing protocols, packet filtering, address translation, the new generation of IP addressing, wireless networks, and network design and implementation. Includes numerous hands-on lab experiments. 
Prerequisites: ISAM 4366 or equivalent.

ISAM 4379 Internship in Management Information Systems
Credit: 3 | Lecture: 3
Supervised work experience related to management information systems with an approved business, industrial firm, or governmental agency; written and oral reports as required. 
Prerequisites: Bachelor's degree candidacy, completion of at least 18 hours of B.S. in M.I.S. required computing courses, and approval of academic adviser, faculty chair and associate dean.

ISAM 4389 Independent Studies in Management Information Systems
Credit: 3 | Lecture: 3
Independent directed study in Management Information Systems. 
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

ISAM 4391 Selected Topics in Management Information Systems
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.
ITEC Information Technology

ITEC 1310 Introduction to Information Technology
Credit: 3 | Lecture: 3 | Lab: 0
This course is an introduction to the concepts and technologies used in the field of Information Technology and ethical issues related to the impact of Information Technology. This class will also prepare students for CompTIA A+ certification exams.

ITEC 2313 Scripting I
Credit: 3 | Lecture: 3 | Lab: 0
This course will introduce practical script programming for computer programming tasks, data manipulation and decision support. Students will be introduced to the structure of scripting languages with emphasis on Python. Laboratory instruction.

ITEC 2351 Web Fundamentals
Credit: 3 | Lecture: 3 | Lab: 0
Introduces the basic languages and tools involved in web publishing. Topics covered will include core publishing technologies such as HTML5, CSS3 and JavaScript. This course also covers the use of Web technology in solving IT problems. Students will build and publish a Web site. The technologies used will include HTML5, CSS5, and JavaScript. Laboratory instruction.

ITEC 2381 Forensics Fundamentals
Credit: 3 | Lecture: 3 | Lab: 0
Introduces the study of digital forensics. Coursework focuses on obtaining forensics evidence, validating image file integrity, data storage methods, deleted file recovery methods, imaging drives, and basic evidence analysis. Laboratory instruction.

ITEC 3312 Scripting II
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. 
Prerequisites: ITEC 2313 or CSCI 1470 or instructor approval.

ITEC 3335 Database Development
Credit: 3 | Lecture: 3
Introduces database theory, design and implementation. Topics covered include business data modeling using the entity-relationship (ER) model, logical database design using the relational data model and database querying using structured query language (SQL). Database design issues are studied in the context of solving business problems. Laboratory instruction.
Prerequisites: ITEC 3312

ITEC 3365 Network Fundamentals
Lecture: 3
Introduces the architecture, structure, functions, components and models of the internet and computer networks. Describes and details the OSI and TCP/IP models. The principles of IP addressing and fundamentals of ethernet, media and operations are introduced. This course also covers LAN topologies and basic configuration of routers and switches. Laboratory instruction.
ITEC 3388 Cyber Security I  
Credit: 3 | Lecture: 3  
This course is the first of a two-course sequence which will cover the ten different security areas (a.k.a. domains) considered important to becoming an information systems security professional. This course will introduce an overview of the fundamental technology, principles and practices of security operations. Students will be introduced to the concepts of information security, risk management, security governance, identification, methods and technologies, intrusion detection systems. Students will also learn about the principles of security architecture and design, and physical and environmental security. They will also be introduced to the notions of telecommunication and network security.  
Prerequisites: CENG 3331 or CINF 3331 or ITEC 3365 or CSCI 1471.

ITEC 4189 Independent Study in Information Technology  
Credit: 1 | Lecture: 1  
Prerequisites: Approval of instructor, chair and associate dean.

ITEC 4195 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.

ITEC 4313 Emerging Information Technology  
Credit: 3 | Lecture: 3  
Today’s business environment is often called the information age and knowledge economy. Today, IT is not just the back-office enabler rather is of strategic importance to any enterprise. In order to meet the challenges of this new environment this course provides an introduction to strategic management of information systems in light of the emerging technologies and their usage in the enterprise environment.

ITEC 4335 Database Administration  
Credit: 3 | Lecture: 3  
This course focuses on providing coverage of DBA tasks including creating database environments, performance, data integrity, security, backup/recovery, data and storage management, tools and other related concepts fundamental to administration of databases. Laboratory instruction. Prerequisites: ITEC 3335.
ITEC 4342 Information Technology Project Management
Credit: 3 | Lecture: 3
The course examines the defining characteristics of technology-oriented projects, especially involving the development of software intensive systems, and introduces students to a variety of project management techniques that can be applied in a technology-oriented project context. Project management issues including estimation, risk-assessment, quality management, monitoring and control will be discussed. While technology-intensive projects are similar in some respects to other types of projects, they also pose unique challenges for the managers and organizations that undertake them. Technology-intensive project management is particularly challenging because of several factors including: (1) the rapid pace of technological changes occurring in the IS and IT fields, (2) the invisible nature of software, (3) the ever-present pressure to add new features and functionality to systems, and (4) the difficulty of managing the organizational changes that accompany most technology implementations. This course gives students an understanding of the most common processes, tools, techniques, and theories that are necessary to manage technology-intensive projects.

Prerequisites: ITEC 3312 or instructor approval.

ITEC 4351 Web Design
Credit: 3 | Lecture: 3
This course will cover advanced Web publishing skills as well as introduce broader publishing topics relevant to publishers, developers, designers and webmasters. The course will also cover topics such as issues related to the practice of user experience. Students will also learn fundamental webmaster topics such as web analytic, search engine optimization and other web tools. The technologies used will include HTML5, CSS3, JavaScript and jQuery. Laboratory instruction.

Prerequisites: ITEC 2351

ITEC 4352 Backend Web Development
Credit: 3 | Lecture: 3
The course will focus on the server-side of Web development and the building dynamic database-driven web sites. Students will learn how to structure content for Websites in a database and how to retrieve that data and manipulate and place it in pages. Laboratory instruction.

Prerequisites: ITEC 3335, ITEC 4351.

ITEC 4365 Network Administration
Credit: 3 | Lecture: 3
Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch. By the end of this course, students will not only be able to configure and troubleshoot routers and switches but also will be able to resolve common issues with RIPv1, RIPv2, single area and multi area OSPF, virtual LANs and Inter-VLAN routing in both IPv4 and IPv6 networks. Laboratory Instruction.

Prerequisites: ITEC 3365.
ITEC 4366 Computer Security and Disaster Recovery
Credit: 3 | Lecture: 3
This course covers general concepts of information systems security and disaster recovery. Topics covered include physical and logical security threats, security vulnerabilities, risk analysis, types of attacks, access control and user authentication, firewalls, database security, intrusion prevention systems and intrusion detection systems, and network security concepts (wired and wireless). This course also provides a managerial perspective on computer security and prepares students for managing information systems security within organizations. Various organizational security policies and mechanisms are discussed. Students are taught to identify critical business systems and functions, data storage and recovery sites, and to develop and test a disaster recovery plan.

ITEC 4379 Internship in Information Technology
Credit: 3 | Lecture: 3
Supervised work experience each week in an approved Information Technology field.
Prerequisites: Approval of faculty chair and associate dean required.

ITEC 4381 Computer Forensics
Lecture: 3
This course examines the various media and strategies of storing information. Students will learn different aspects of computer crime and ways in which to protect, uncover and understand digital evidence. Students will gain experience using hardware and software tools to perform investigations. Laboratory instruction.
Prerequisites: CSCI 1471 or CINF 1370 or ITEC 2381.

ITEC 4382 Registry & Internet Forensics
Lecture: 3
Introduces the registry structure and focuses on creating preliminary reports, searching for evidence in the NTuser.dat, SAM, SYSTEM, SOFTWARE and SECURITY artifacts to analyze user behavior on the system. Laboratory instruction.
Prerequisites: ITEC 2381 or instructor approval.

ITEC 4383 Cyber Security II
Credit: 3 | Lecture: 3
This course is the second of a two-course sequence which will cover the ten different security areas (a.k.a. domains) considered important to becoming an information systems security professional. It presents an overview of technology, principles and practices of security operations. The students will be introduced to the concepts of Cryptography, public key infrastructure, quantum cryptography, secure protocols, different attack types, business continuity planning and management. The students will also learn about secure software development approaches, database concepts and security issues, malware types and attacks. They will be introduced to policy and procedure related to– evidence collection, incident handling etc.
Prerequisites: ITEC 3388.
ITEC 4388 Senior Project in Information Technology
Credit: 3 | Lecture: 3
May be taken only during the final semester before graduation. Registration is restricted to students with an approved Candidate Plan of Study. Students design and implement a solution to a realistic IT project. Emphasis will be on practical experience, professional behavior, ethics and teamwork. Students prepare written reports and give oral presentations.

ITEC 4389 Independent Study in Information Technology
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, chair and associate dean.

LEGL Legal Studies

LEGL 2301 Legal Environment of Business
Credit: 3 | Lecture: 3
Major content areas include general principles of law and the legal system, contracts, sales, commercial paper, bank-customer relations, agency and property.

LEGL 3301 Business Law
Credit: 3 | Lecture: 3 | Lab: 0
Course reviews various areas of law that directly affect business operations. This course examines the nature and source of law and the legal system as well as understanding contracts, courts and procedures, sales, commercial paper and bank-customer relations as well as agency and community property.

LEGL 3307 Legal Writing and Appellate Process
Credit: 3 | Lecture: 3
Principles of legal drafting and case analysis; preparation of legal documents and rules of appellate process.
Prerequisites: LEGL 3351 or equivalent

LEGL 3313 Introduction to Law and the American Legal System
Credit: 3 | Lecture: 3
Overview of the American legal system and the structure of law and legal institutions in the United States.

LEGL 3321 Logic
Credit: 3 | Lecture: 3
An investigation of traditional approaches to correct and incorrect reasoning.

LEGL 3342 American System of Trial By Jury
Credit: 3 | Lecture: 3
This course provides an analysis of process of trial by jury from the initial examination of the jury panel through closing arguments. Emphasis will be placed on the preparation of a case to be tried in small claims court.

LEGL 3351 Legal Research
Credit: 3 | Lecture: 3
The law library, research, briefing and case preparation through the use of digests, encyclopedias and other research sources.

LEGL 3353 Introduction to the Texas Rules of Civil Procedure
Credit: 3 | Lecture: 3
This course will cover the rules of civil procedure that govern the drafting of the plaintiff’s original petition through the drafting of discovery.
LEGL 4189 Independent Studies in Legal Studies
Credit: 3 | Lecture: 3
Independent directed study in Legal Studies. 
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

LEGL 4324 The U.S. Constitution and the Bill of Rights
Credit: 3 | Lecture: 3
Study of the evolution of the U.S. Constitution from the passage of the Declaration of Independence to the present.

LEGL 4325 Legal Concepts for Human Resource Professionals
Credit: 3 | Lecture: 3
This course provides students with a basic understanding of the federal laws governing the employee/employer relationship with emphasis on non-discrimination, wage and hour laws, and employee benefits.

LEGL 4332 Legal Dimensions of Healthcare Law
Credit: 3 | Lecture: 3
Legal aspects of the doctor-patient-nurse-other health professional relationships; individual, corporate and institutional liability and responsibility. (Cross-listed with HADM 4332.)

LEGL 4352 Family Law and Procedure
Credit: 3 | Lecture: 3
Study of the fundamental principles of the law of family relations, divorce, adoption, custody, marriage, juvenile, etc.; includes analysis of family law procedures, appropriate forms and pleadings.

LEGL 4353 Dispute Resolution
Credit: 3 | Lecture: 3
Analysis of the various methods of resolving disputes between citizens outside the traditional adversarial system.

LEGL 4354 Property Transactions
Credit: 3 | Lecture: 3
Study of the fundamental principles and procedures of law related to the acquisition, control and disposition of property.

LEGL 4355 Criminal Law and Procedure
Credit: 3 | Lecture: 3
This course will introduce students to the substantive law of crime and punishment, the law of arrest through trial, and conviction and the constitutional protection involved in the process.

LEGL 4356 Torts
Credit: 3 | Lecture: 3
Study of the principles of the law of torts focusing on learning the causes of action, the elements of each and how to recognize the causes of action given certain facts.

LEGL 4359 Wills, Probate and Estate Administration
Credit: 3 | Lecture: 3
This course is designed to introduce the broad subject of estate planning, including basic will preparation and the drafting of statutory form powers of attorney, medical directives and medical powers of attorney. The various forms of estate administration in Texas will be studied.
LEGL 4361 Texas Consumer Law  
Credit: 3 | Lecture: 3  
An analysis of the principle consumer protection statutes in Texas and related federal laws. Special emphasis will be placed on The Texas Deceptive Trade Practices Act.

LEGL 4362 Elder Law  
Credit: 3 | Lecture: 3  
This course will focus on a variety of legal issues related to the aging of America. The Texas law of guardianship will be reviewed in depth including the state specific certification requirements to become a registered professional guardian.

LEGL 4365 Mock Trial  
Lecture: 3  
Students enrolled in this course will study and execute a complete mock trial based on an assigned civil or criminal case file published by the National Institute of Trial Advocacy. Students will also be required to perform a mock trial demonstration as part of the Annual Student Conference for Research and Creative Arts.  
Prerequisites: LEGL 3342 or equivalent.

LEGL 4368 Seminar on the U.S. Constitution and Bill of Rights  
Credit: 3 | Lecture: 3  
Field experience involving traveling to the National Constitution Center in Philadelphia to meet and study with the Center's staff of constitutional experts and to explore the historic sites such as Independence Hall.

LEGL 4375 Professional Development for Legal Studies Students  
Credit: 3 | Lecture: 3 | Lab: 0  
This course is intended to be capstone course in the legal studies program to provide students with an understanding of the practice of law in Texas as well as non-traditional opportunities for student with a legal education; a final project will be assigned.  
Prerequisites: Course is taken in the last or next to the last semester in the legal studies program

LEGL 4379 Internship in Legal Studies  
Credit: 3 | Lecture: 3  
Supervised field experience with an approved agency or office. Written and oral reports required.  
Prerequisites: Approval of faculty adviser and program director.

LEGL 4389 Independent Studies in Legal Studies  
Credit: 3 | Lecture: 3  
Independent directed study in Legal Studies.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

LEGL 4391 Selected Topics in Legal Studies  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

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.
### LITR Literature

#### LITR 2321 British Literature
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0
A survey of the development of British literature from the Anglo-Saxon period to the present. Students will study works of prose, poetry, drama, and fiction in relation to their historical, linguistic, and cultural contexts. Texts will be selected from a diverse group of authors and traditions.

*Prerequisites: WRIT 1301*

#### LITR 2326 American Literature
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0
A survey of American literature from the period of exploration and settlement to the present. Students will study works of prose, poetry, drama, and fiction in relation to their historical, linguistic, and cultural contexts. Texts will be selected from a diverse group of authors for what they reflect and reveal about the evolving American experience and character.

*Prerequisites: WRIT 1301*

#### LITR 2341 Literature and Experience
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0
The study of one of more literary genres including poetry, fiction, drama, and film.

*Prerequisites: WRIT 1301*

#### LITR 2371 Introduction to Creative Writing
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0
Instruction and practical experience in techniques and genres of imaginative writing. May include lyric poetry, short fiction, drama, and/or creative nonfiction. Fulfills Core Creative Arts requirement.

*Prerequisites: WRIT 1301 and WRIT 1302*

#### LITR 3301 Literary Studies: Genres and Critical Perspectives
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0
Introduction to the close study of literary and dramatic texts and issues affecting interpretation.

#### 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 3338 Modern Fantasy Literature
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0
This course surveys the development of the fantasy genre in English and American literature from its origins in the late 19th c., through the works of Tolkien and on to contemporary fantasy authors such as George R.R. Martin. The course also looks at the ways fantasy has proliferated into popular culture, especially roleplaying games such as D&D and computer gaming.

#### 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 4312 Chaucer  
Credit: 3 | Lecture: 3 | Lab: 0  
The art of England's greatest narrative poet: Canterbury Tales, Troilus, and Criseyde.

LITR 4316 16th- and 17th-Century British Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Non-Shakespearean poetry, drama, and prose of early modern Britain, including selections from writers such as Wyatt, Marlowe, Spenser, Jonson, Donne, Wroth, Lanyer, Milton, and Marvell.

LITR 4318 Restoration and 18th-Century British Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Representative British texts and authors of the period 1660–1790, such as Dryden, Behn, Pope, Swift, Defoe, Johnson, and Boswell.

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 4321 Jane Austen  
Credit: 3 | Lecture: 3 | Lab: 0  
An overview of the life and work of Jane Austen, focusing on major novels, such as Pride and Prejudice, and early works, such as Lady Susan, in relation to literary and cultural traditions of the period.

LITR 4322 Victorian Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Major Victorian essayists, poets, and novelists, including Tennyson, the Brontes, George Eliot, Gaskell, Stoker, and Wilde; literary responses to industrialization, empire, and class struggle; examination of social, artistic, and moral tensions in Victorian literature.

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 4326 Early American Literature
Credit: 3 | Lecture: 3 | Lab: 0
Multicultural voices and texts from Native America, Spanish America, and African America; early dominant cultures of Puritans and Founders; spoken traditions, cultural history, and early modern literature.

LITR 4328 The American Renaissance
Credit: 3 | Lecture: 3 | Lab: 0
The Romantic period of American literature featuring Transcendentalists, classic and popular fiction, slave narratives in context of antebellum culture; authors include Emerson, Poe, Hawthorne, Stowe, Douglass, Dickinson, Whitman, and others.

LITR 4330 American Realism and Naturalism
Credit: 3 | Lecture: 3 | Lab: 0
Literature of social observation and criticism, psychological realism, effect of social and natural science on literary form, literature of American folkways. Authors may include Twain, Wharton, James, Chesnutt, and Crane.

LITR 4334 The American Novel
Credit: 3 | Lecture: 3 | Lab: 0
Focus on development of form, style, and theme in American fiction; major and lesser-known novelists over two centuries.

LITR 4335 American Modernism
Credit: 3 | Lecture: 3 | Lab: 0
Literary experimentation in context of international Modernism; expressions of social and cultural dislocation or search for order. Authors may include Eliot, Fitzgerald, Faulkner, and Hurston.

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 4338 American Minority Literature
Credit: 3 | Lecture: 3 | Lab: 0
Survey or in-depth focus on classic and contemporary texts for America's ethnic and/or gender minorities: African Americans, Native Americans, Mexican Americans, women and others may be included.

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 4345 Contemporary Novel  
Credit: 3 | Lecture: 3 | Lab: 0  
Novels of recent decades from around the world; topics may include postcolonialism, postmodernism, transnationalism, technology, and virtuality. Authors may include Atwood, Ben Jelloun, Bolano, Coetzee, Djebar, Lahiri, Mieville, Morrison, Murakami, Ondaatje, Pamuk, Powers, and Winterson.

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 4350 Masterpieces of 19th-Century European Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Revolutionary literary and philosophical works from 19th-century European tradition; includes such writers as Balzac, Flaubert, Nietzsche, Marx, Dostoevski, Austen, Dickens, Blake, and Turgenev.

LITR 4352 Masterpieces of 20th-Century European Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Major works by 20th-century European writers, including James, Conrad, Woolf, Proust, Colette, Camus, Mann, Kafka, Nabokov, and Duras; topics may include the problems of modern existence, war, human rights, the citizen, and the writer.

LITR 4356 Modern American and British Poetry  
Credit: 3 | Lecture: 3 | Lab: 0  
Myth and epic, the personal poem, Expressionism, neo-Romanticism; includes such poets as Yeats, Auden, Stevens, and Frost.

LITR 4358 Contemporary Poetry  
Credit: 3 | Lecture: 3 | Lab: 0  
Poetry in English after 1950, American or transnational focus; may include such figures as Lowell, Ginsberg, Rich, Heaney, and Walcott.

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 4366 Literature and Religion  
Credit: 3 | Lecture: 3 | Lab: 0  
Texts concerning spiritual journeys, religious passion, and impact of belief on character. Religions may be Western or non-Western, world or folk. Genres may range from scriptures to novels, memoirs to poetry. Topics, texts, and themes will vary. May be repeated for credit with permission of instructor.
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 4371 Comedy  
Credit: 3 | Lecture: 3 | Lab: 0  
The comic view of the human predicament as seen in writers such as Aristophanes, Moliere, Wilde, and others.

LITR 4389 Independent Study in Literature  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required. May be taken for 3 hours of credit. For 1 hour of Independent Study credit, students should enroll in LITR 4189.

LITR 4391 Selected 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.

LLAS Latinx and Latin American Studies  

LLAS 2301 Topics in Latinx and Latin American Studies, Humanities  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of topics in Latinx and Latin American Studies. Topics vary; may be repeated for credit with permission of instructor.

LLAS 2302 Topics in Latinx and Latin American Studies, Human Sciences  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of topics in Latinx and Latin American Studies. Topics vary; may be repeated for credit with permission of instructor.

LLAS 4309 Topics in Latinx and Latin American Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Upper-level course on topics in Latinx and Latin American Studies. Topics vary; may be repeated for credit with permission of instructor.

LLLS Literacy, Language Arts and Literature Studies  

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 4313 Corrective and Remedial Reading  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Study of neurophysiology and psychology in treating disabled readers, including dyslexia and related disorders. Evaluation of strategies of correction and remediation. Field experiences required.  
*Prerequisites: LLLS 4311 or LLLS 4352 and concurrent enrollment in LLLS 4332*

LLLS 4332 Diagnostic and Prescriptive Reading  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Diagnostic evaluation of readers; remedial approaches to vocabulary, comprehension, word identification, phonemic awareness and fluency. Field experiences required.  
*Prerequisites: LLLS 4311 or LLLS 4352 and concurrent enrollment in LLLS 4313*

LLLS 4344 Literacy Methods for EC–6  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
This course examines the application of theories and strategies for teaching the language arts for EC–6. Field experience is required.  
*Prerequisites: Students must complete LLLS 4311 and TCED 4303 prior to taking this course.*

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 Literacy Methods for 4–8  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
This course examines the application of theories and strategies for teaching the language arts for 4–8. Field experience is required.  
*Prerequisites: Students must complete LLLS 4311 and TCED 4304 prior to taking this course.*

LLLS 4347 Multicultural Literature  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Survey of multicultural literature for children focusing on titles which reflect the diverse cultures and exceptionalities in the EC–8 classroom.

LLLS 4348 Selecting Literature for the Very Young Child  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Survey of literature for very young children focusing on titles appropriate for children from birth to age five.

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 4379 Practicum in Clinical Reading  
Credit: 3 | Lecture: 3 | Lab: 0  
Practices of diagnosing reading difficulties, grouping techniques and clinical evaluations; and three hours each week in a reading laboratory setting using selected materials and reading aids.  
Prerequisites: 12 hours of Reading coursework including LLLS 4313 and LLLS 4332 or equivalent and approval of instructor and associate dean.

LLLS 4389 Independent Study in Reading  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

LLLS 4391 Selected Topics in Reading  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by specific title each time course is offered.

MATH Mathematics

MATH 1314 College Algebra  
Credit: 3 | Lecture: 3  
Study of quadratics; polynomial, rational, logarithmic and exponential functions; systems of equations; progressions; sequences and series and matrices and determinants.  
Prerequisites: Meet TSI college-readiness standard for Mathematics; or equivalent.

MATH 1324 Mathematics for Business and Social Sciences  
Credit: 3 | Lecture: 3  
Topics from college algebra (linear equations, quadratic equations, functions and graphs, inequalities), mathematics of finance (simple and compound interest, annuities), linear programming, matrices, systems of linear equations, applications to management, economics and business.  
Prerequisites: Meet TSI college-readiness standard for Mathematics; or equivalent.

MATH 1325 Calculus for Business and Social Sciences  
Credit: 3 | Lecture: 3  
Limits and continuity, derivatives, graphing and optimization, exponential and logarithmic functions, anti-derivatives, integration, applications to management, economics and business.  
Prerequisites: MATH 1324 or MATH 1314 with a C- or better or meet requirement in UHCL Mathematics Department Placement and Testing policy.

MATH 1332 Contemporary Mathematics  
Credit: 3 | Lecture: 3  
Topics include introductory treatments of sets, logic, number systems, number theory, relations, functions, probability and statistics. Appropriate applications are included.  
Prerequisites: Appropriate score on placement exam.
MATH 1342 Elementary Statistical Methods
Credit: 3 | Lecture: 3
Collection, analysis, presentation and interpretation of data; probability, sampling, correlation and regression, analysis of variance and the use of statistical software.
Prerequisites: Meet TSI college-readiness standard for Mathematics; or equivalent.

MATH 1350 Mathematics for Teachers I
Credit: 3 | Lecture: 3
Concepts of sets, functions, numeration systems, number theory and properties of the natural numbers, integers, rational and real number systems with an emphasis on problem solving critical thinking. Open only to teacher certification students.
Prerequisites: MATH 1314 or higher with a C- or better.

MATH 1351 Mathematics for Teachers II
Credit: 3 | Lecture: 3
Concepts of geometry, probability and statistics; as well as applications of the algebraic properties of real numbers to concepts of measurement with an emphasis on problem solving and critical thinking. This course is designed specifically for students who seek middle grade (4-8) teacher certification. Open only to teacher certification students.
Prerequisites: MATH 1350

MATH 2305 Discrete Mathematics
Credit: 3 | 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 2412 Pre-Calculus Mathematics  
Credit: 4 | Lecture: 4  
In depth combined study of algebra, trigonometry and other topics for calculus readiness.  
Prerequisites: MATH 1314 with a C- or better or meet requirement in UHCL Mathematics Department Placement and Testing policy.

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  
Credit: 4 | 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 3300 Introduction to Modern Algebra and Number Theory  
Credit: 3 | Lecture: 3  
An introduction to techniques of proof, problem solving and applications using topics from number theory, discrete mathematics and logic such as symbolic logic, various proof methods, sequences and recursion, congruence classes, modular arithmetic, permutations and inductive and deductive argument forms.  
Prerequisites: MATH 2413

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 and Non-Euclidian Geometry  
Credit: 3 | Lecture: 3  
Formal set theory, logical structure and measurement.  
Prerequisites: MATH 1314
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
<th>Lecture</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 3306</td>
<td>Problem Solving</td>
<td>3</td>
<td>3</td>
<td>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</td>
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<tr>
<td>MATH 3307</td>
<td>Functions and Modeling</td>
<td>3</td>
<td>3</td>
<td>Students will engage in lab-based activities designed to strengthen and expand their knowledge of the topics in secondary mathematics, focusing on topics from pre-calculus and elementary calculus. Explorations will involve the use of multiple representations, transformations, data analysis techniques and interconnections among geometry, probability, and algebra. The use of quantitative approaches and building relationships between discrete and continuous reasoning will be recurring themes. Only for UTeach certificate students. Prerequisites: MATH 2412</td>
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<tr>
<td>MATH 3312</td>
<td>Number Theory</td>
<td>3</td>
<td>3</td>
<td>Properties of divisibility. Prime numbers, congruence arithmetic, Fermat's and Euler's Theorem, multiplicative functions, cryptology and applications of these ideas, an overview of techniques of mathematical proof. Prerequisites: MATH 3300 or MATH 3331.</td>
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<tr>
<td>MATH 3331</td>
<td>Advanced Calculus</td>
<td>3</td>
<td>3</td>
<td>Set theory. Real number system. Sequences and series. Differentiation. The Riemann integral. Prerequisites: MATH 2315 or equivalent.</td>
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<tr>
<td>MATH 4313</td>
<td>Introduction to Topology</td>
<td>3</td>
<td>3</td>
<td>Topological techniques in analysis, metric spaces, continuous transformations, connectivity, separation, compactness; nets and filters, cardinal arithmetic. Prerequisites: MATH 3331.</td>
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<tr>
<td>MATH 4315</td>
<td>Numerical Analysis and its Applications</td>
<td>3</td>
<td>3</td>
<td>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, MATH 3331, C/C++ or equivalent.</td>
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<tr>
<td>MATH 4316</td>
<td>Mathematic Software Applications</td>
<td>3</td>
<td>3</td>
<td>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 2315, MATH 2318, MATH 2320, CSCI 1320, CSCI 1470.</td>
<td></td>
</tr>
</tbody>
</table>
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 Nonlinear Dynamics 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 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 distribution and central limit theorem.
*Prerequisites: MATH 2414*

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 4346 Probability for Actuarial Exam P1
Credit: 3 | Lecture: 3
This course is designed to prepare students for the first actuarial exam. This course consists of introducing, reviewing concepts and rules of probability and statistics and studying sample actuarial examinations and related material. Students are given sample problems from past actuarial examinations to study outside of class. The solution of these problems and related material are discussed in class.
*Prerequisites: MATH/STAT 4344*

MATH 4348 Introduction to Financial Math for Exam FM
Credit: 3 | Lecture: 3
This course is designed to help students for the second actuarial exam. This course consists of introducing the basics of sample interest and discount, compound interest and simple annuities and studying sample actuarial examinations and related material. Students are given sample problems from past actuarial examinations to study outside of class. The solution of these problems and related material are discussed in class.
*Prerequisites: MATH 2414*
MATH 4350 Financial Economics for Actuarial Exam MFE  
Credit: 3 | Lecture: 3  
A mathematical insight of some fundamental concepts of financial mathematics and financial economics, and their application to real world business situations and basic risk management. An introduction to mathematical approach to understanding stochastic calculus, asset pricing, hedging and portfolio theory.  
Prerequisites: MATH/STAT 4344

MATH 4363 Functions of a Complex Variable  
Credit: 3 | Lecture: 3  
The theory of limits, differentiation and integration in the complex plane. Gauss' theorem and residue calculations.  
Prerequisites: MATH 2315 or equivalent.

MATH 4379 Internship in Mathematics  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written or oral report required.  
Prerequisites: 15 hours of upper-level credit; approval by program chair and associate dean.

MATH 4389 Independent Study in Mathematics  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.

MATH 4391 Selected Topics in Mathematics  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

MENG Mechanical Engineering

MENG 1204 Engineering Graphics for Mechanical Engineers  
Credit: 2 | Lecture: 1 | Lab: 3  
Introduction to computer aided drafting using CAD software and sketching to generate two and three-dimensional drawings based on the conventions of engineering graphical communication; topics include spatial relationships, multi-view projections and sectioning, dimensioning, graphical presentation of data and fundamentals of computer graphics. A grade of “C” or better is required in all prerequisite courses.  
Prerequisites: MATH 1314 or equivalent.

MENG 3210 Mechanical Engineering Lab I  
Credit: 2 | Lecture: 1 | Lab: 3  
Applications of statistical principles to engineering measurements. Laboratory techniques to measure engineering quantities such as displacement, pressure, temperature, and strain with a primary focus on steady state measurements. The course includes an introduction to transient transducer response, filtering and signal conditioning. An introduction to experimental methods and procedures, estimation of measurement uncertainty, reduction of data to significant form, and the organization of experimental results in written reports. A grade of "C" or better is required in all prerequisite courses.  
Prerequisites: ENGR 2305, PHYS 2326, PHYS 2126
MENG 3211 Mechanical Engineering Lab II  
Credit: 2 | Lecture: 1 | Lab: 3  
A continuation of MENG 3210 with increased focus on dynamic systems measurements and measurements relevant to thermal and fluid systems. Dynamic and transient considerations in instruments, physical systems, and experimental data are investigated. Additional introduction to experimental methods and procedures, estimation of measurement uncertainty, reduction of data to significant form, and the organization of experimental results in written reports. A grade of "C" or better is required in all prerequisite courses.  
Prerequisites: MENG 3210, MENG 3310  
Corequisites: MENG 3316

MENG 3310 Introduction to Fluid Mechanics  
Credit: 3 | Lecture: 3 | Lab: 0  
Properties of fluids, fluid statics and resistance of fluids in laminar and turbulent flows. Fundamental mechanics of compressible and incompressible fluid motion with application to engineering problems. Control volumes and application to fluid flow analysis. Dimensional analysis, similitude, dimensionless properties. Internal and external flows. Introduction to computational fluid dynamics and concepts of turbomachinery. Physics majors may substitute PHYS 3311 and PHYS 3321 for MATH 2320 and ENGR 2302 as prerequisites for this course. Grades of “C” or better in MATH 2315, MATH 2320 (or equivalent), ENGR 2302, or PHYS 3321 are required to enroll in this course.  
Prerequisites: ENGR 2302, MATH 2315, MATH 2320, PHYS 3311, PHYS 3321.

MENG 3303 Solid Mechanics  
Credit: 3 | Lecture: 3 | Lab: 0  
Stress, strain, and their relationships. Stress and deformation analysis of beams subjected to axial, torsional, bending, and distributed loads. Elastic and plastic deformation of engineering materials. Buckling analysis, energy methods, and thermal stress analysis. Physics majors may substitute PHYS 3321 for ENGR 2301 as a prerequisite for this course. A grade of "C" or better is required in all prerequisite courses.  
Prerequisites: ENGR 2301, PHYS 3321 (PHYS majors only)
MENG 3314 Design Methodology
Credit: 3 | Lecture: 3 | Lab: 0
An overview of the design activity in engineering. Topics include the product design process, project planning, quality function deployment, design specification, concept generation and selection, system and subsystem design. Also, an introduction to engineering economics and its application to the design process. Design team projects. MENG 3316 or MENG 3344 shall be taken prior to, or concurrent with, enrollment in this course. As the first of a three-course sequence, it is expected that students enrolled in this course must reasonably expect to complete their Mechanical Engineering Degree requirements and graduate within the next three long semesters. A grade of "C" or better is required in all prerequisite courses.
Prerequisites: MENG 1204, MENG 3303, MENG 3310, MENG 3316 or MENG 3344
Corequisites: MENG 3316, MENG 3344

MENG 3316 Heat Transfer
Credit: 3 | Lecture: 3 | Lab: 0
The study of the conduction, convection, and radiation modes of heat transfer; both steady and unsteady state systems. Governing equations, boundary conditions, and initial conditions are considered. One and two-dimensional heat flow and thermal circuit concepts. Heat sinks and heat exchanger characteristics and applications of heat transfer to thermal systems design are included. Physics majors may substitute PHYS 3311 and PHYS 3351 for MATH 2320 and MENG 3334 as prerequisites for this course. A grade of “C” or better is required in all prerequisite courses.
Prerequisites: MATH 2315, MATH 2320 or PHYS 3311, MENG 2334 or PHYS 3351 and MENG 3310.

MENG 3324, Introduction to Materials Science
Credit: 3 | Lecture: 2 | Lab: 3
An introduction to the behavior and structure of engineering materials. Grain structure, behavior, and failure analysis of metals with emphasis on controlling structure and mechanical properties. Phase distribution analysis and heat treating of engineered metals. Generalized characteristics of polymers and composite materials. Prior successful completion of or concurrent enrollment in MENG 3303 is required. A grade of "C" or better is required in all prerequisite courses.
Prerequisites: CHEM 1111, CHEM 1311.
Corequisites: MENG 3303

MENG 3334 Thermodynamics I
Credit: 3 | Lecture: 3
Key thermodynamics properties such as enthalpy, entropy, work, heat, compressibility and phase. First and second laws of thermodynamics and applications. Important thermal cycles and modeling of closed and open systems. A grade of “C” or better is required in all prerequisite courses.
Prerequisites: MATH 2315, CHEM 1311, CHEM 1111, PHYS 2325, PHYS 2125.

MENG 3344 Introduction to Manufacturing Processes
Credit: 3 | Lecture: 2 | Lab: 3
An introduction to casting, forming, machining, and joining processes for metals and nonmetals using traditional and computer aided manufacturing techniques. Includes a survey of manufacturing technologies and industrial practice. A grade of “C” or better is required in all prerequisite courses.
Prerequisites: MENG 3324, MENG 3303.
MENG 4143 Thermal/Fluid Laboratory  
Credit: 1 | Lecture: 0 | Lab: 3  
Laboratory application of principles of fluid mechanics, thermodynamics, and heat transfer. Experience with typical thermal and fluids lab equipment, such as wind tunnels, flumes and piping systems. Measurements using various sensors, such as orifice plates, turbines, pitot tubes, anemometers and thermocouples.  
Corequisites: MENG 4343

MENG 4179 Internship in Mechanical Engineering  
Credit: 1 | Lecture: 1  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: 15 hours of upper-level credit; approval by program chair and associate dean.

MENG 4189 Independent Study in Mechanical Engineering  
Credit: 1 | Lecture: 1 | Lab: 0  
Prerequisites: Approval of instructor, program chair and associate dean.

MENG 4240 Senior Design Project I  
Credit: 2 | Lecture: 0 | Lab: 6  
This is the second course of a three-course sequence in which student teams apply the techniques learned in MENG 3314 to design and prototype practical engineering systems to meet customer requirements and realistic constraints. This course covers project planning, project specification and scoping, quality function deployment (QFD), functional decomposition, preliminary design, and initial prototype development; including preliminary analysis and testing. The students gain experience in written and oral engineering communications and applying knowledge and techniques acquired during their engineering education. Students must reasonably expect to complete their mechanical engineering degree requirements within 2 long semesters upon completion of this course. Successful completion of (with a grade of "C" or better) or concurrent enrollment in MENG 4310 or MENG 4343 is required.  
Prerequisites: MENG 3314, MENG 4310, MENG 4343  
Corequisites: MENG 4310, MENG 4343.

MENG 4241 Senior Design Project II  
Credit: 2 | Lecture: 0 | Lab: 6  
This is the third course of a three-course sequence. The project initiated in MENG 4340 is completed. The course will focus on converting the design into a working system. Teams will develop and conduct testing of their system, demonstrate and document successfully meeting the design requirements. The students will gain additional experience in practical engineering communications and will investigate funding, entrepreneurship, and intellectual property associated with their designs. A grade of "C" or better is required in all prerequisite courses.  
Prerequisites: MENG 4240.
MENG 4279 Internship in Mechanical Engineering  
Credit: 2 | Lecture: 2  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
**Prerequisites:** 15 hours of upper-level credit; approval by program chair and associate dean.

MENG 4289 Independent Study in Mechanical Engineering  
Credit: 2 | Lecture: 2  
**Prerequisites:** Approval of instructor, program chair and associate dean.

MENG 4302 Introduction to Mechatronics  
Credit: 3 | Lecture: 2 | Lab: 3  
Characterization, design, selection, and integration of mechatronic systems and components including AC and DC motors, generators, servo-motors, stepper motors, controllers, solenoids, hydraulic and pneumatic actuators. A grade of “C” or better is required in all prerequisite courses.  
**Prerequisites:** MENG 3211, MATH 2320,  
**Corequisites:** MENG 4310

MENG 4305 Finite Element Analysis  
Credit: 3 | Lecture: 3 | Lab: 0  
Fundamental concepts of finite element analysis including matrix methods, boundary value solution techniques, interpolation techniques and mesh refinement. Applications to trusses, beams, and two-dimensional solids. Pre and post processing, error analysis and interpretation of the results. A grade of “C” or better is required in all prerequisite courses.  
**Prerequisites:** MENG 3303, MATH 2318

MENG 4307 Alternative Energy Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
A survey of alternative and sustainable energy sources; primarily solar (photovoltaic and thermal), wind, and hydrogen fuel cell technologies will be investigated. Other technologies investigated depending on interest. Current technical literature will be reviewed to assess state of the art. A grade of “C” or better is required in all prerequisite courses.  
**Prerequisites:** MENG 2334  
**Corequisites:** MENG 4343

MENG 4309 Design for Manufacturing  
Credit: 3 | Lecture: 3 | Lab: 0  
Design principles for achieving quick, low cost product introduction through consideration of costs, quality, reliability, maintainability, appearance and ergonomics. The effects of production volume, production methods, materials selection, and part geometry on manufacturing costs are considered. Methods for estimating and reducing tooling costs are presented. A significant focus is placed on production methods for mass production from a single machine. A grade of “C” or better is required in all prerequisite courses.  
**Prerequisites:** MENG 3344, MENG 3314.
MENG 4310 Dynamics and Control of Mechanical Systems  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to automatic control systems; mathematical models of physical systems; block diagrams and signal flow graphs; transient and steady state responses; P, PI, PD, and PID controllers; stability of linear feedback systems; root-locus and Routh's criteria; frequency response methods; Nyquist and Bode plots; stability margins; state-variable formulation of dynamic systems. A grade of “C” or better is required in all prerequisite courses.  
Prerequisites: ENGR 2302, ENGR 2304, MATH 2320, MENG 3211.

MENG 4331 Design of Machine Elements  
Credit: 3 | Lecture: 3 | Lab: 0  
Analysis for the design and manufacture of basic mechanical elements, and their role in the design of machines. A brief review of relevant topics including stress/deflection, failure theories, and contact stress. These topics are extended to the design of fundamental mechanical components including shafts, gears, springs, bearings, fasteners, and clutches/brakes. A grade of "C" or better is required in all prerequisite courses.  
Prerequisites: ENGR 2302, MENG 3303 and MENG 3314.

MENG 4333 Vibrations  
Credit: 3 | Lecture: 3 | Lab: 0  
Development of equations of motion for multi-degree of freedom systems. Concepts of vibration and damping using scalar and matrix approaches. Modal analysis, vibration of beams, and boundary condition application. A grade of “C” or better is required in all prerequisite courses.  
Prerequisites: ENGR 2302, MATH 2320  
Corequisites: MENG 4310

MENG 4340 Mechanical Engineering Capstone I  
Credit: 3 | Lecture: 1 | Lab: 4  
The senior capstone project is a two-semester sequence in which student teams will apply the techniques learned in MENG 3314 to design and build practical engineering systems to meet customer requirements and realistic constraints. The first semester covers project planning, project specification and scoping, Quality Function Deployment, Functional Decomposition, preliminary design, and partial prototype development; including preliminary analysis and testing. The students will gain experience in written and oral engineering communications. A grade of “C” or better is required in all prerequisite courses.  
Prerequisites: MENG 3314  
Corequisites: MENG 4331, MENG 4343
MENG 4341 Mechanical Engineering Capstone II
Credit: 3 | Lecture: 1 | Lab: 4
This is the second course in the two-semester sequence. The project initiated in MENG 4340 is completed. The course will focus on converting the design into a working system. Teams will develop and conduct testing of their system, demonstrate and document successfully meeting the design requirements. The students will gain additional experience in practical engineering communications and will investigate funding, entrepreneurship, and intellectual property associated with their designs. A grade of “C” or better is required in all prerequisite courses.
Prerequisites: MENG 4340

MENG 4343 Thermal/Fluid System Design
Credit: 3 | Lecture: 3 | Lab: 0
Applications of the engineering design process, thermodynamics, fluid dynamics, and heat transfer to practical engineering problems in the thermal/fluids domain. Heat exchanger design, pump and piping selections, mathematical techniques, economic considerations, curve fitting, and system identification. Use of relevant engineering codes and standards. Students are required to take MENG 2334 or MENG 3334 as prerequisites. A grade of "C" or better is required in all prerequisite courses.
Prerequisites: MENG 2334, MENG 3334, MENG 3310, MENG 3314, MENG 3316.
Corequisites: MENG 4143

MENG 4379 Internship in Mechanical Engineering
Credit: 3 | Lecture: 3
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.
Prerequisites: 15 hours of upper-level credit; approval by program chair and associate dean.

MENG 4389 Independent Study in Mechanical Engineering
Credit: 3 | Lecture: 3
Prerequisites: Approval of instructor, program chair and associate dean.

MENG 4391 Selected Topics in Mechanical Engineering
Credit: 3 | Lecture: 3 | Lab: 0
Advanced topics relevant to any area of mechanical engineering, identified by title each time the course is offered.

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 3313 Organizational Communication
Credit: 3 | Lecture: 3
A study of theories and practices in organizational communication, dissemination of information in organizational settings, effectiveness, relative costs and feedback potential.
Prerequisites: MGMT 3301 or equivalent.
MGMT 3331 Human Resource Management  
Credit: 3 | Lecture: 3  
Problems and practices in human resource management; selection, placement, evaluation, promotion and termination.  
Prerequisites: MGMT 3301 or equivalent.

MGMT 3341 Human Resource Planning, Staffing and Selection  
Credit: 3 | Lecture: 3  
Techniques for planning and recruiting human resource needs in the context of organizational requirements. Staffing and selection techniques and practice relative to legal concerns and labor market considerations.  
Prerequisites: MGMT 3331 or equivalent.

MGMT 3351 Wage and Salary Administration  
Credit: 3 | Lecture: 3  
Job performance evaluation and development of compensation plans and programs.  
Prerequisites: MGMT 3301 or equivalent.

MGMT 4189 Independent Studies in Management  
Credit: 3 | Lecture: 3  
Independent directed study in Management.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

MGMT 4312 Strategic Management (Capstone)  
Credit: 3 | Lecture: 3  
In addition, registration is restricted to students with an approved Candidate Plan of Study. The study of the formulation, implementation and assessment of strategic decisions.  
Prerequisites: MGMT 3301, MKTG 3301, FINC 3331 and LAST SEMESTER.

MGMT 4316 Human Resource Management Information Systems  
Credit: 3 | Lecture: 3  
Principles and procedures and contemporary programs used in the development of information systems to aid human resource decision making.

MGMT 4325 Legal Concepts for Human Resource Professionals  
Credit: 3 | Lecture: 3  
This course provides students with a basic understanding of the federal laws governing the employee/employer relationship with emphasis on non-discrimination, wage and hour laws, and employee benefits.

MGMT 4326 Effective Negotiations  
Credit: 3 | Lecture: 3  
This course is designed to provide a basic foundation in negotiation theory and practice. The focus of this course will be upon developing analytical and interpersonal skills in the context of negotiation simulations and discussions using a variety of settings and media, reflecting on the various situations in which negotiations take place today. The student will be given the opportunity to practice negotiation skills in one-on-one and team simulations.

MGMT 4327 Leadership  
Credit: 3 | Lecture: 3  
The course will examine and focus on proven executive leadership best practices across a range of complex organizations.
MGMT 4328 Cross Cultural and International Leadership  
Credit: 3 | Lecture: 3  
This course will focus on identifying and evaluating leadership dimensions from a cross-cultural perspective. The central theme of the course is to cultivate leadership behaviors for success in the international organization environment.

MGMT 4332 Organizational Design and Learning  
Credit: 3 | Lecture: 3  
Surveys theory and research on the structure of business organizations and processes affecting their management.  
Prerequisites: MGMT 3301 or equivalent.

MGMT 4333 Collective Bargaining in the Public Sector  
Credit: 3 | Lecture: 3  
Comparisons and contrasts of collective bargaining in the public and private sectors; the impact of unionization on public administration.  
Prerequisites: MGMT 3301 or equivalent.

MGMT 4334 Leading Teams  
Credit: 3 | Lecture: 3  
Exploring issues related to team membership, including leading teams, team foundation and development, roles within the teams, effective team member interactions, and the successful management of team processes.  
Prerequisites: MGMT 3301 & MGMT 4354.

MGMT 4336 Principles of Entrepreneurship  
Credit: 3 | Lecture: 3  
Examines the preparation and foundation of new ventures. Topics include opportunity recognition, market analysis, organizational forms and ownership structures, venture capital, strategy formulation and feasibility analysis. This course includes preparation and presentation of a comprehensive business plan.  
Prerequisites: MGMT 3301 and MKTG 3301 or equivalents.

MGMT 4337 Applied Small and Family Business Management  
Credit: 3 | Lecture: 3  
This course will provide students with an opportunity to practice entrepreneurial skills and tools while supporting local businesses, nonprofit firms, or the community.  
Prerequisites: MGMT 4336 or equivalent

MGMT 4341 Leadership in a Global Business Environment  
Credit: 3 | Lecture: 3  
The topic of leadership will be explored in the context of the global business environment.

MGMT 4351 Industrial Labor Relations  
Credit: 3 | Lecture: 3  
Collective bargaining processes in American industry; impact of labor management relations on wage and employment levels and on national income.  
Prerequisites: MGMT 3301 or equivalent.
MGMT 4353 International Business Management
Credit: 3 | Lecture: 3
Managerial considerations in international business operations; government involvement, organizational structure, operating policies and market peculiarities.
Prerequisites: MGMT 3301 or equivalent.

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 4355 Seminar in International Management
Credit: 3 | Lecture: 3
Field experience involving meetings with top management personnel of businesses operating outside the United States. Discussions will center on the economic, cultural, social, legal and other environmental constraints that affect firms in other countries.

MGMT 4356 Employee Training and Organizational Development
Credit: 3 | Lecture: 3
This course is designed to explore the field of employee and organization development. The course explores the fundamentals of training and organizational development, critical models and approaches utilized by training and organizational development professionals, and critical elements necessary for a successful training and/or organizational development program.
Prerequisites: MGMT 3331 and MGMT 4354 or equivalent.

MGMT 4371 Seminar on the Social Responsibility of Business
Credit: 3 | Lecture: 3
The changing role of business enterprise in society; influences of government regulatory agencies on social consciousness in the business world.
Prerequisites: MGMT 3301 or equivalent.

MGMT 4379 Internship in Management
Credit: 3 | Lecture: 3
Three or six hours of supervised work experience each week in an approved business or industrial firm.
Prerequisites: 15 hours of upper-level credit and approval of program director.

MGMT 4389 Independent Studied in Management
Credit: 3 | Lecture: 3
Independent directed study in Management.
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.
MGMT 4391 Selected Topics in Management
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

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 3313 Marketing Channels and Distribution
Credit: 3 | Lecture: 3
Examination of the strategic role of distribution within the overall marketing strategy. Specific managerial and regulatory issues in designing and coordinating industrial distribution channels and channel relationships are discussed. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3314 Logistics Strategy
Credit: 3 | Lecture: 3
An in-depth analysis of logistics and its role within the distribution strategy. The functional components such as inventory control, transportation, warehousing, purchasing, and supply chain management are examined. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3331 Integrated Marketing Communications
Lecture: 0 | Lab: 1
Focus is on building relationships between brands and customers through the strategic use of the elements of the marketing communication mix, including advertising, sales promotion, direct marketing, personal selling and public relations. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3332 Professional Selling
Credit: 3 | Lecture: 3
A study of the field of professional selling as an integral component of the promotional activities of the organization. Discussions focus on the selling of goods and services to organizational buyers in the context of long-term relationships. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3342 Brand Management
Credit: 3 | Lecture: 3
An in-depth analysis of the power of branding on customer behavior and its impact on business results. Topics covered include the importance of branding, brand equity, characteristics of a good brand name and brand mark, brand identity and design, brand promise, brand positioning and repositioning, brand attributes and personality, messaging and taglines, measuring success, and emerging issues. 
Prerequisites: MKTG 3301 or equivalent.
MKTG 3343 Consumer Behavior
Credit: 3 | Lecture: 3
This course focuses on the individual consumer as a primary consideration in strategic marketing decisions. It provides insight into the motivations, influences, and processes underlying consumption behavior, including psychological, situational, and socio-cultural factors. Specific topics include perception, attitudes, values, consumer decision-making, and customer satisfaction, among others. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3344 Internet Marketing
Credit: 3 | Lecture: 3
An examination of how the internet is transforming relationships between organizations and their customers, as well as changing the competitive dynamics of the marketplace, with an emphasis on the strategic role of the internet in the marketing plan. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3346 Healthcare Marketing
Credit: 3 | Lecture: 3
The growth of competition among healthcare providers provides new and exciting opportunities for marketers. This course provides students with the knowledge and skills needed to effectively market health care products and services. Students examine consumer needs, target market concepts, service development, pricing strategies, customer communications, channel management, cost benefit analysis, ethical considerations, and emerging issues in healthcare.

MKTG 3347 Customer Relationship Management
Credit: 3 | Lecture: 3
This course covers relationship management as an effective component of an organization's marketing effort. The primary emphasis is on the effort of the firm to manage its relationship with customers, including the capture, storage and analysis of customer information, with discussion of the people, processes, and technology involved in taking full advantage of this information. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3348 Retail Management
Credit: 3 | Lecture: 3 | Lab: 0
The study of fundamental retailing concepts and practices from a management perspective. Topics include location selection, store layout, store operation and management, branding, merchandising, shelf management, pricing alternatives, point-of-sale merchandising, advertising and communication effectiveness, customer service, customer analysis, and retail information systems and control. 
Prerequisites: MKTG 3301 or equivalent.

MKTG 3351 Marketing Research
Credit: 3 | Lecture: 3
Focus is on the use of market intelligence to provide marketing decision-makers with data on the effectiveness of the current marketing mix, direction for necessary changes, and insight into new opportunities in the marketplace. 
Prerequisites: MKTG 3301 or equivalents.
MKTG 3360 Social Media Marketing  
Credit: 3 | Lecture: 3 | Lab: 0  
An introductory look at the history, theory, technology, and uses of social media as a component of an organization's integrated marketing communications plans. The course surveys current and emerging trends in the digital marketing space, and how it all fits together within a strategic marketing framework.  
Prerequisites: MKTG 3301 or equivalent.

MKTG 4189 Independent Studies in Marketing  
Credit: 3 | Lecture: 3  
Independent directed study in Marketing.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

MKTG 4311 Sales Management  
Credit: 3 | Lecture: 3  
A study of the tasks of the sales manager including the organization, planning, operation and control of a field sales force. The course emphasizes managerial problem solving in business-to-business marketing.  
Prerequisites: MKTG 3332 or equivalent.

MKTG 4332 Services Marketing  
Credit: 0 | Lecture: 3  
Concepts and strategies in service industries which serve business and organizational customers. Examines the role of pricing, promotion, distribution, and product strategies in the business service sector.  
Prerequisites: MKTG 3301 or equivalent or permission of instructor for non-majors.

MKTG 4333 Marketing for Entrepreneurs  
Credit: 3 | Lecture: 3  
Application of marketing theories and principles to small businesses and new business ventures.  
Prerequisites: MKTG 3301 or equivalent.

MKTG 4334 Marketing Strategy  
Lecture: 0 | Lab: 1  
Integrating marketing concepts such as purchasing, market segmentation and the 4 Ps and applying them to develop market strategies.  
Prerequisites: MKTG 3301 or equivalent.

MKTG 4335 Brands and Brand Management  
Credit: 3 | Lecture: 3  
Effective brand management drives customer loyalty and superior long-term company performance. Brands and Brand Management is an undergraduate course that explores why brands are important, what they represent to consumers, and what firms should do to manage them effectively. Some of the topics covered in this course include brand positioning and repositioning; choosing brand elements such as brand names, brand marks, spokes-characters, and endorsers; brand architecture and brand extensions; measuring brand performance; and managing brands over time and across geographic boundaries.  
Prerequisites: Prerequisite: MKTG 3331
MKTG 4338 Sports Marketing  
Credit: 3 | Lecture: 3  
Sports marketing examines the world of sports from a strategic marketing perspective. More specifically, this course examines the strategic decisions related to target market, product, price and promotion within sports marketing context. An integrating strategic concept will be moving spectators up the ‘fan ladder’. The course concludes with a discussion of emerging issues in sports marketing.  
Prerequisites: MKTG 3301 and MKTG 3343

MKTG 4351 International Marketing  
Credit: 3 | Lecture: 3  
Begins with a discussion of incentives for and barriers to international trade, and foreign market selection and entry strategies. Examines product, price, distribution, and promotion decisions in an international context. Involves analysis and critique of the marketing strategies used by a multinational firm.  
Prerequisites: MKTG 3301 or equivalent.

MKTG 4352 Seminar in International Marketing  
Credit: 3 | Lecture: 3  
Field experience involving meetings with the chief marketing officers of firms operating in areas outside the United States. Sessions will concentrate on marketing problems found in other cultures, the solutions used to address those problems and how these problems and solutions are different from the American experience.

MKTG 4379 Internship in Marketing  
Credit: 3 | Lecture: 3  
Three or six hours of supervised work experience each week in an approved marketing unit.  
Prerequisites: 15 hours of upper-level credit and approval of program director.

MKTG 4389 Independent Studies in Marketing  
Credit: 3 | Lecture: 3  
Independent directed study in Marketing.  
Prerequisites: Approval of instructor, Faculty Chair and Associate Dean required.

MKTG 4391 Selected Topics in Marketing  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

MSCI Military Science

MSCI 3310 Advanced Military Science  
Lecture: 0 | Lab: 1  
Leadership; preparing combat orders; military instruction principles; small unit tactics; tactical communications; fitness training. Class is designed to prepare students for Advanced Camp. Fitness training required three times per week in addition to class and lab.  
Prerequisites: MSCI 2220 or consent of the chair.

MSCI 3320 Advanced Military Science  
Lecture: 0 | Lab: 1  
Leadership; preparing combat orders; military instruction principles; small unit tactics; tactical communications; fitness training. Class is designed to prepare students for Advanced Camp. Fitness training required three times per week in addition to class and lab.  
Prerequisites: MSCI 2220 or consent of the chair.
MSCI 3398 Special Problems
Lecture: 0 | Lab: 1
Prerequisites: junior standing and consent of department chair.

MSCI 3491 leadership development and assessment course
Lecture: 0 | Lab: 1
Off-campus field training practicum stressing application of leadership management with emphasis on tactical and special military skills. Places students in demanding and stressful leadership situations.
Prerequisites: MSCI 3320 or consent of the chair.

MSCI 4310 Advanced Military Science
Lecture: 0 | Lab: 1
Leadership and command; military law; administration/staff operations and procedures; dynamics of the military team; training management; ethics and professionalism. Fitness training required three times per week in addition to class and lab.
Prerequisites: MSCI 3320 or consent of the chair.

MSCI 4320 Advanced Military Science
Lecture: 0 | Lab: 1
Leadership and command; military law; administration/staff operations and procedures; dynamics of the military team; training management; ethics and professionalism. Fitness training required three times per week in addition to class and lab.
Prerequisites: MSCI 3320 or consent of the chair.

MSCI 4398 Special Problems
Lecture: 0 | Lab: 1
Prerequisites: senior standing and consent of department chair.

NCBM Non-Course Based Option

NCBI 0001 NCB Integrated Reading and Writing
Students attend a series of workshops designed to enhance critical reading and academic writing skills. Topics include reading comprehension, application of prior learning, and strategies for approaching college writing.
Prerequisites: By placement.
Corequisites: WRIT 1301

NCBM 0001 NCB MATH
Students move through a series of content modules using a mastery learning approach in a lab environment. Topics include solving systems of equations, applications involving systems of equations, solving radiation and quadratic equations and functions.
Prerequisites: By placement.
Corequisites: MATH 1314 or MATH 1332

NCBR 0001 NCB Reading
Students attend a series of workshops designed to enhance reading skills. Topics include literary analysis, analyzing author's use of language, surmising inferences in a text or texts, and identifying main ideas and supporting details. Workshops are assigned based on individual student needs. Students must demonstrate mastery of topics assigned as they progress through the workshop series.
Prerequisites: By placement.
Corequisites: WRIT 1301
NCBW 0001 NCB Writing
Students attend a series of workshops designed to enhance writing skills. Topics include understanding sentence structure and sentence logic, mastering agreement, and learning strategies for essay revision. Workshops are assigned based on individual student needs. Students must demonstrate mastery of topics assigned as they progress through the workshop series.
Prerequisites: By placement.
Corequisites: WRIT 1301

NURS Nursing

NURS 3309 Role Transition
Credit: 3 | Lecture: 3 | Lab: 0
Explores the transition of the registered nurse to the role of the baccalaureate nurse. Emphasis is placed on demonstration of professionalism, leadership, critical thinking, clinical reasoning and application of the nursing process in the care of culturally diverse populations across the lifespan and at various stages of the wellness/illness continuum. Roles of the nurse as member of the profession, provider of patient-centered care, patient safety advocate and member of the interdisciplinary team will be explored.
Prerequisites: RN license

NURS 3310 Legal and Ethical Issues
Credit: 3 | Lecture: 3 | Lab: 0
Identifies current ethical and legal issues facing nursing today. Explores basic legal and ethical principles and value formation. The role of the state board of nursing in the regulation of nursing practice is reviewed along with landmark court cases affecting nursing practice.
Prerequisites: RN license

NURS 3311 History and Theories of Nursing
Credit: 3 | Lecture: 3 | Lab: 0
Explore the historical development of nursing. Introduction of nursing theorists and how nursing theories influence nursing practice today.

NURS 3313 Community Health Nursing
Credit: 3 | Lecture: 3 | Lab: 0
Provides an overview of the delivery of nursing care in a variety of community-based settings. Examination of spiritual, cultural, and socioeconomic factors and their impact on the health care of individuals, families, communities, and populations. Role of the nurse as patient advocate within an interdisciplinary team for health promotion and disease prevention for at-risk populations.
Corequisites: NURS 3323

NURS 3314 Trends and Issues in Nursing Practices
Credit: 3 | Lecture: 3 | Lab: 0
Current professional, political, and social issues and trends that affect the nursing profession today and in the future. Strategies for individual and collective participation in decisions that influence professional nursing practice and health care delivery will be explored.

NURS 3323 Community Health Nursing Project
Credit: 3 | Lecture: 3 | Lab: 0
Provides the opportunity to apply principles and methods for comprehensive assessment, program planning and intervention in an identified population. Focus is on the application of the knowledge and skills of community health nursing.
Corequisites: NURS 3313
NURS 4313 Nursing Research
Credit: 3 | Lecture: 3 | Lab: 0
Introduces students to the research process and provides students with the knowledge and competence needed to critique a research article and to apply research to support their evidenced-based practice.

NURS 4314 Advanced Leadership and Management
Credit: 3 | Lecture: 3 | Lab: 0
This course introduces students to the research process and will provide students with the knowledge and competence needed to critique a research article and to apply research to support their evidenced-based practice.
Corequisites: NURS 4324

NURS 4324 Advanced Leadership and Management Practicum
Credit: 3 | Lecture: 3 | Lab: 0
Emphasis critical thinking and clinical reasoning in the application of the leader/manager role. Clinical experience will focus on the application of leadership and management practices, including organization, planning, staffing, directing and controlling resources.
Corequisites: NURS 4314

NURS 4389 Independent Study in Nursing
Credit: 3 | Lecture: 0 | Lab: 0
Advanced instructional concepts, methods, and technologies in teaching and administering secondary level physical education programs.

OSHE Occupational Safety and Health

OSHE 3304 Safety, Health and Liability in Schools
Credit: 3 | Lecture: 3
Safety and health principles and practice as applied to schools. Includes hazard recognition and control infield, laboratory and classroom environments, emergency response, regulations, guidelines and teacher liability. Science majors may use only as an unrestricted elective.

OSHE 3311 Industrial Health and Hygiene
Credit: 3 | Lecture: 3
General review of industrial health. Basic principles of industrial hygiene investigation. Physical and chemical hazards in the industrial workplace. Workplace environmental control.
Prerequisites: CHEM 2323, PHYS 1301

OSHE 3332 Principles of Professional Safety
Credit: 3 | Lecture: 3
Includes how to organize and administer effective safety programs. Looks at future trends for business and industry and what changes the safety professional must keep abreast of in economic, environmental, regulatory and technical advances affecting their field.

OSHE 3340 Techniques of Safety Engineering and Analysis
Credit: 3 | Lecture: 3
Practical application of basic engineering skills in the identification, evaluation and control of industrial hazards. Emphasis is on effective solution to safety design and operational problems and application of the Safety Precedence Sequence in the selection of hazard control measures.
Prerequisites: PHYS 1302
OSHE 4195 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.

OSHE 4314 Personal Protective Equipment  
Credit: 3 | Lecture: 3  
Basic design and use of commonly used protective equipment in industry with emphasis on respiratory protection principles including approaches to training and instruction for proper usage.

OSHE 4315 Industrial Radiological Health  
Credit: 3 | Lecture: 3  
Non-calculus based presentation of the principles of ionizing radiation and non-ionizing intended to provide basic competency in radiation protection through an understanding of the nature, uses, health effects, measurement and control of radiation.  
**Prerequisites:** PHYS 1302

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.

OSHE 4321 Ergonomics, Human Factors and Workspace Design  
Credit: 3 | Lecture: 3  
Ergonomics. Use of biological and engineering principles to design a safe and efficient workplace environment including biomechanics, anthropometry, heat and cold stress, vibration, pressure, illumination, work station and tool design and the presentation of visual, auditory and other sensory forms of information.  
**Prerequisites:** BIOL 2302
OSHE 4323 Hazardous Materials and Emergency Management
Credit: 3 | Lecture: 3
This course studies hazardous material storage, handling, effects and use as well as the most effective ways to respond to hurricanes, terrorist attacks and/or hazmat spills. It provides information to students as to how to deal with officials, how to establish command & control, coordinate communications, evacuate people and perform clean up. The course also includes emergency management, preparedness, local, state and federal government emergency management; as well as disaster relief organizations.
Prerequisites: CHEM 2323

OSHE 4324 Fire Safety Engineering
Credit: 3 | Lecture: 3
This course studies fire science, causes, prevention, inspection, etc. This includes purpose; definition; fire prevention activities, extinguishment, detection, hazards, fire behavior, fire causes, types of construction including structural features, flame spread, occupancy and fire load; inspection techniques, conducting inspections.
Prerequisites: CHEM 1311, PHYS 1301

OSHE 4331 Air Pollution Science
Credit: 3 | Lecture: 3
This course studies air pollution science and air quality. This includes historical events, sources and emissions, sampling and analysis, visibility and climate, indoor air quality, regulations, abatement, human exposures, health effects, toxicology, epidemiology and risk assessment.
Prerequisites: BIOL 2302, 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.

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 manufacturer 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 4336 Environmental Safety and Health  
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.

OSHE 4341 Advanced Studies in Occupational Safety and Health  
Credit: 3 | Lecture: 3  
Approval of faculty adviser and associate dean. The selection, study and formal presentation of topics in Occupational Safety and Health 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: 15 hours of upper-level credit.

OSHE 4379 Internship in Occupational Safety and Health  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written and oral reports required.  
Prerequisites: 15 hours of upper-level credit; Approval of faculty adviser and associate dean

OSHE 4389 Independent Study in Occupational Safety and Health  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean

OSHE 4391 Selected Topics in Occupational Safety and Health  
Credit: 3 | Lecture: 3  
Identified by specific title each time course is offered.

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. Includes laboratory and field experience with calibration and use of noise instrumentation.  
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. Includes laboratory and field experience with industrial ventilation.  
Prerequisites: MATH 1314 or higher.

OSHE 4422 Industrial Hygiene Sampling and Analysis  
Credit: 4 | Lecture: 3 | Lab: 1  
Sampling and analysis for common occupational hazards including principles of calibration, laboratory and field management techniques. Includes laboratory and field experience with sampling and analysis methods and instrumentation.  
Prerequisites: CHEM 2323, STAT 3308
PHIL Philosophy

PHIL 1301 Introduction to Philosophy
Credit: 3 | Lecture: 3 | Lab: 0
A study of major issues in philosophy and/or the work of major figures in philosophy. Topics in philosophy may include theories of reality, theories of knowledge, theories of value, and their practical applications.

PHIL 3321 Logic
Credit: 3 | Lecture: 3 | Lab: 0
An investigation of traditional approaches to correct and incorrect reasoning. The application of logic to our "everyday world" is an integral part of the course.

PHIL 3331 Ethics
Credit: 3 | Lecture: 3 | Lab: 0
A primary course in assessing ethical questions, judgments, and systems of morality. Readings will address contemporary ethical issues.

PHIL 3343 Philosophy of Knowledge
Credit: 3 | Lecture: 3 | Lab: 0
Historical approach to the theory of knowledge (epistemology). Issues addressed include skepticism, the role of sense perception, and the justification of knowledge claims. Readings include works by Plato, Descartes, Hume, and Kant.

PHIL 4314 The Great Philosophers I
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the ideas of the great philosophers of the Western tradition from ancient Greece through the Middle Ages.

PHIL 4315 The Great Philosophers II
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the ideas of the great philosophers of the modern Western world.

PHIL 4322 Philosophy of Religion
Credit: 3 | Lecture: 3 | Lab: 0
Investigation of the responses of philosophers and theologians to questions about the nature of God and the problem of evil.

PHIL 4389 Independent Study in Philosophy
Credit: 3 | Lecture: 0 | Lab: 0
Permission of instructor required.

PHIL 4391 Selected 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.

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. Corequisites: PHYS 1301

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. Corequisites: PHYS 1302
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*  
*Corequisites: PHYS 1101*

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*  
*Corequisites: PHYS 1102*

PHYS 2125 Laboratory for University Physics I  
**Credit: 1 | Lecture: 0 | Lab: 3**  
Introduction to data acquisition and analysis  
in physics. Instrumentation used to conduct  
experiments on motion, kinematics, wave  
mechanics, sound and heat. Topics also to  
include statistical methods, graphing, error  
analysis, computer techniques and reporting  
results.  
*Corequisites: PHYS 2325*

PHYS 2126 Laboratory for University Physics II  
**Credit: 1 | Lecture: 0 | Lab: 3**  
Instrumentation used to conduct experiments  
on electrical circuits and optics. Topics include  
Ohm's Law, series and parallel circuits, electrical  
power EMF, RLC Components, optical elements  
and visual phenomena.  
*Corequisites: PHYS 2326*

PHYS 2325 University Physics I  
**Credit: 3 | Lecture: 3**  
Calculus based introductory physics course.  
Fundamentals of linear and rotational  
kinematics and dynamics, Newton's laws,  
work, energy, conservation, gravitation, wave  
mechanics, sound, fluid mechanics, heat and  
thermodynamics.  
*Prerequisites: MATH 2413*  
*Corequisites: PHYS 2125*

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 3103 Laboratory for Modern Physics  
**Credit: 1 | Lecture: 0 | Lab: 3**  
This course provides students with the exposure  
to modern physics phenomena and a variety  
of experimental techniques which develops  
a broad background essential for the future  
understanding of and the performance of  
research in physics. It includes experimental  
testing of quantum mechanics and its  
applications to atomic physics and light.  
*Corequisites: PHYS 3303*
PHYS 3303 Modern Physics  
Credit: 3 | Lecture: 3  
An introduction to topics in modern physics. Black-body radiation, quantum mechanics, atomic and molecular physics, solid state physics, special relativity, nuclear and particle physics.  
*Prerequisites: PHYS 2326 or equivalent*  
*Corequisites: PHYS 3103*

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 3321 Intermediate Mechanics  
Credit: 3 | Lecture: 3  
This course is an advanced undergraduate study of the classical motion of particles according to Newton's Theory. In this course we study Rectilinear motion, Oscillations, Noninertial Reference Systems, Central Forces, Systems of Particles and Rigid Body Motion.  
*Prerequisites: PHYS 3303 or equivalent.*

PHYS 3331 Intermediate Electromagnetism  
Credit: 3 | Lecture: 3  
A thorough introduction to electrostatics, magnetostatics and electrodynamics. Practical examples and some demonstration experiments will be used to connect the elegant mathematical theory of electromagnetism with physical intuition.  
*Prerequisites: PHYS 3303 or equivalent.*

PHYS 3342 Quantum Theory I  
Credit: 3 | Lecture: 3  
*Prerequisites: PHYS 3303 or equivalent.*

PHYS 3343 Quantum Theory II  
Credit: 3 | Lecture: 3  
Continuation of Quantum Theory I. This course covers quantum physics with applications drawn from modern physics. Topics include general formalism of quantum mechanics, harmonic oscillator, quantum mechanics in three dimensions, angular momentum, spin, and addition of angular momentum.  
*Prerequisites: PHYS 3342*
PHYS 3351 Thermodynamics & Statistical Mechanics
Credit: 3 | Lecture: 3
Temperature, heat and work, thermodynamic properties of gases, solids and solutions; homogeneous and heterogeneous equilibria; thermodynamics of electrochemical cells; statistical thermodynamics; calculation of thermodynamic properties; chemical kinetics. Prerequisites: PHYS 3303 or equivalent.

PHYS 4115 Physics Practicum
Credit: 1 | Lecture: 0 | Lab: 3
Practical experience at an on-campus or off-campus facility. Requires junior or senior standing, pre-acceptance interview, minimum of 50 hours of work over the term and approval of instructor.

PHYS 4189 Independent Study in Physics
Credit: 1 | Lecture: 1
Prerequisites: Approval of instructor, chair and associate dean.

PHYS 4195 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 4201 Advanced Physics Lab
Credit: 2 | Lab: 6
Experimental physics lab utilizing advanced instrumentation and techniques. Prerequisites: PHYS 3103, PHYS 3303

PHYS 4202 Computational Physics
Credit: 2 | Lecture: 1 | Lab: 3
This course is a project-driven lecture/lab intended to give students a deeper understanding of how to solve physics problems through a series of computational projects. Projects will cover topics from introductory physics courses including projectile motion, oscillatory motion, Newton's law of gravity and electric and magnetic fields. Students will learn to write computer programs on computers using the Linux operating system.

PHYS 4322 Statics and Mechanics of Materials
Credit: 3 | Lecture: 3
This course introduces students to the fundamental principles and methods of structural mechanics. Topics covered include: static equilibrium, force resultants, support conditions, analysis of determinate planar structures (beams, trusses, frames), stresses and strains in structural elements, states of stress (shear, bending, torsion), statically indeterminate systems, displacements and deformations, introduction to matrix methods, elastic stability, and approximate methods. Prerequisites: PHYS 2325

PHYS 4333 Special Relativity
Credit: 3 | Lecture: 3
In this course we derive Einstein's theory of special relativity, Lorentz transformations and relativistic electrodynamics using tensor analysis and spacetime diagrams. Prerequisites: PHYS 3331 or Instructor approval.
PHYS 4352 Fluids and Heat Transfer  
Credit: 3 | Lecture: 3  
The course introduces fluid mechanics and heat transfer. The fluid mechanics section includes the flow of gases and liquids through tubing and various kinds of process apparatus. The flow of bubbles in liquids and drops in gases will also be discussed along with the flow of gases and liquids through packed and fluidized particle beds. Bernoulli’s equation will be used. The heat transfer section includes heat transfer by conduction, convection and radiation in liquids, gases and solids.  
Prerequisites: PHYS 2325, PHYS 2326

PHYS 4362 Fundamentals of Astroparticle Physics  
Credit: 3 | Lecture: 3  
Topics include: Introduction to high energy physics, symmetries and conservation rules, neutrino astrophysics, particle cosmology and astrophysics.  
Prerequisites: PHYS 3303 or equivalent.

PHYS 4371 Research Seminar I  
Credit: 3 | Lecture: 3  
First of a two-semester capstone experience. Research methods, literature search, writing a scientific paper. Seminar speaker reviews on current research in physics, space science and engineering. Development of a supervised research project. Written report and oral presentation.  
Prerequisites: Senior standing, Instructor approval required.

PHYS 4372 Research Seminar II  
Credit: 3 | Lecture: 3  
Prerequisites: PHYS 4371.

PHYS 4379 Internship in Physics  
Credit: 3 | Lecture: 3  
Supervised work experience in an approved industrial firm or government agency. Written and oral report required.  
Prerequisites: 15 hours of upper-level credit; approval by program chair and associate dean.

PHYS 4389 Independent Study in Physics  
Credit: 3 | Lecture: 3  
Prerequisites: Approval of instructor, chair and associate dean.

PHYS 4391 Selected Topics in Physics  
Identified by specific title each time course is offered.

POLS Political Science

POLS 2305 Federal Government  
Credit: 3 | Lecture: 3 | Lab: 0  
Origin and development of the U.S. Constitution, structure and powers of the national government including the legislative, executive, and judicial branches, federalism, political participation, the national election process, public policy, civil liberties, and civil rights.
POL 2306 Texas Government
Credit: 3 | Lecture: 3 | Lab: 0
Origin and development of the Texas constitution, structure and powers of state and local government, federalism, and intergovernmental relations, political participation, the election process, and the political culture of Texas.

POL 3301 Contemporary Issues in Political Science
Credit: 3 | Lecture: 3 | Lab: 0
Examination of current issues and problems in American and international politics.

POL 3331 Legislative Process
Credit: 3 | Lecture: 3 | Lab: 0
Functions of the United States Congress and the Texas Legislature; legislative relationships with other sectors of government.

POL 3332 State and Local Government
Credit: 3 | Lecture: 3 | Lab: 0
Analysis of state and local government with special emphasis on the Texas State Legislature and the Houston City Council.

POL 3361 Politics and Film
Credit: 3 | Lecture: 3 | Lab: 0
Relationship between film and politics with special attention given to the role of film in the transmission of political information and ideas.

POL 4312 Race and Ethnic Politics
Credit: 3 | Lecture: 3 | Lab: 0
Examination of relationship between racial and ethnic minorities and the American political system.

POL 4313 Civil Liberties in America
Credit: 3 | Lecture: 3 | Lab: 0
Factors and forces that have altered the scope of civil liberties in the U.S.; history and analyses.

POL 4314 Chief Executive
Credit: 3 | Lecture: 3 | Lab: 0
Constitutional, political, and administrative responsibilities of chief executives in government in comparison to the President of the United States.

POL 4315 Judicial Process
Credit: 3 | Lecture: 3 | Lab: 0
The role of law, lawyers, and judges in influencing social and political change in America; history and analyses.

POL 4317 Voting and Elections
Credit: 3 | Lecture: 3 | Lab: 0
Analysis of electoral behavior in the United States including determinants of the vote, election turnout, issues and elections, and media in elections.

POL 4342 International Relations
Credit: 3 | Lecture: 3 | Lab: 0
Analysis of the major theoretical approaches to international politics; explores important historical and contemporary questions and debates in international affairs.

POL 4355 Political Philosophy
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a frame of reference for classifying and assessing the merits of individual political theories in terms of their philosophical foundations.
POLS 4391 Selected Topics in Political Science  
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.

PSLD Public Service Leadership

PSLD 4325 Budgeting in Public Service  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the theory and practice of budgeting in the public setting.

PSLD 4326 Human Resources  
Credit: 3 | Lecture: 3 | Lab: 0  
Problems and practices in human resource management; selection, placement, evaluation, promotion, and termination in the public sector.

PSLD 4327 Organizational Behavior  
Credit: 3 | Lecture: 3 | Lab: 0  
This course exposes students to advanced behavioral science theories and applications in management and draws from numerous disciplines including law, psychology, sociology, economics, organization theory, and statistics.

PSLD 4340 Current Issues in Representative Bureaucracy  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will cover both intellectual and practical bureaucratic issues facing public servants over the past decade. The topics covered in this course will provide a foundation for further academic research, as well as important knowledge of the extant research for practitioners in public organizations.

PSLD 4342 Project Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of organization, planning, and implementation of activities related to a project. Provides practical knowledge on managing project scope, schedule, and resources.

PSLD 4343 Public Service Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of basic theories of administrative organization, relationships, and behavior. How to structure, manage, direct, and control units within fire service organizations.

PSLD 4344 Public Service Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of determinants and consequences of effective and ineffective leadership in fire service organizations.

PSLD 4345 Strategic Planning  
Credit: 3 | Lecture: 3 | Lab: 0  
Strategic planning and facilitation of organizational change in fire service organizations.

PSLD 4347 Managerial Issues in Diversity  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of the ideas necessary for leading a diverse workforce successfully.

PSLD 4348 Crisis and Emergency Management  
Credit: 3 | Lecture: 3 | Lab: 0  
The focus of this course is to provide students with an understanding and overview of crisis management and the constituent elements and implications of crises that professional may face on the personal, work, local, regional, national, and international levels.
PSLD 4349 Ethics and Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the unique ethical challenges faced by leaders with an emphasis on building ethical competency while investigating the legal aspects.

PSLD 4389 Independent Study in Public Service Leadership  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

PSLD 4391 Selected Topics in Public Service Leadership  
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 Psychology

PSYC 1100 Learning Frameworks  
Credit: 1 | Lecture: 1 | Lab: 1  
An inquiry around the broad, interdisciplinary concepts of civic engagement and citizenship for students to explicitly examine and engage in advanced critical thinking for university study. This course promotes intellectual readiness by helping students build and find the resources to become personally responsible and active members of the university community, their education, and their word.

PSYC 1300 Learning Frameworks  
Credit: 3 | Lecture: 3 | Lab: 1  
An inquiry around the broad, interdisciplinary concepts of civic engagement and citizenship for students to explicitly examine and engage in advanced critical thinking and cognition, acquisition of resources, introduction to research, and service learning.

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 2314 Human Growth and Development Lifespan  
Credit: 3 | Lecture: 3 | Lab: 0  
Lifespan Growth and Development is a study of social, emotional, cognitive and physical factors and influences of a developing human from conception to death.

PSYC 2317 Statistical Methods in Psychology  
Credit: 3 | Lecture: 3  
An introduction to and application of commonly used quantitative statistics in psychology and other behavioral sciences. It will focus on answering research questions using appropriate statistical techniques and interpretation of results.

PSYC 2319 Social Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
Attitudes, social cognition, personal perceptions, self, social influences, relationships, prejudice, helping, and aggression. Theories, research, and application.
PSYC 2330 Biological Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
The biological basis for how one thinks, feels, and acts.

PSYC 3311 Careers and Writing in Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
This course covers careers in psychology, provides experience with preparing for job searches and graduate school application process, and introduces students in APA style writing in the social sciences. For Psychology majors only. Psychology majors should take this course in the first semester of their junior year at the latest.

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.

PSYC 3321 Learning  
Credit: 3 | Lecture: 3 | Lab: 1  
Basic principles of learning and how they apply to human behavior. For students interested in taking the Board Certified Behavior Analyst (BCBA) exam, this course serves as the first course in a 4-course sequence. Prerequisite: PSYC 2301 Introduction to Psychology.

PSYC 3327 Practicum in Peer Mentoring and Leadership  
Credit: 3 | Lecture: 0 | Lab: 0  
This upper-level course will focus on applying the tenants of critical thinking to higher education students' success and development through the practice of peer mentoring. This is a rigorous course using research from the fields of psychology and higher education within service learning.  
Prerequisites: Students must have completed 45 credit hours and must have a 2.75 G.P.A.

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 3333 Human Sexuality  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of psychological, biological, and cultural viewpoints on sexual behavior, including research on attraction, gender, sexual dysfunction, sexual variations, sexual orientation, and sexual coercion.

PSYC 3334 Drugs and Behavior  
Credit: 3 | Lecture: 3 | Lab: 0  
Mechanisms and effects of alcohol, opiates, sedatives, tranquilizers, stimulants, psychedelics, and other psychotropic drugs; problems of abuse and attempts at control and education.
PSYC 3335 Behavioral Pharmacology Research
Credit: 3 | Lecture: 0 | Lab: 3
Laboratory investigation of drug/brain/behavior relationships in the rat. Readings from primary research literature, laboratory experiments, and research reports. Permission of instructor required.

PSYC 3336 Behavioral Neuroscience Research
Credit: 3 | Lecture: 0 | Lab: 3
Laboratory investigation of brain/behavior relationships in the rat. Readings from primary research literature, laboratory experiments, and research reports. Permission of instructor required.

PSYC 3341 Human Factors Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Covers how users should be included in design process including needs analysis, requirements writing, iterative testing of low/medium/high fidelity prototypes, and implementation.

PSYC 4189 Independent Study in Psychology
Credit: 1 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 1 hour of credit. For 3 hours of Independent Study credit, students should enroll in PSYC 4389.

PSYC 4314 Child Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Cognitive, social, and emotional development of children; psychoanalytic, behavioristic, and Piagetian approaches.

PSYC 4315 Adolescent Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Problems of role and identity in relation to adolescents’ needs for acceptance, autonomy, and intimacy; special attention will be given to topics such as sexual maturation, love and friendship, and drug abuse.

PSYC 4318 Sensation and Perception
Credit: 3 | Lecture: 3 | Lab: 0
This course will expose students to the complexities and mechanism of human perception. Class will focus not only on the details of human perception but also the application of such knowledge. The design of the course will utilize applied learning techniques and will involve work outside the classroom.

PSYC 4321 Applied Behavior Analysis I
Credit: 3 | Lecture: 3 | Lab: 0
Second course in a 4-course sequence to prepare students for the Board Certified Assistant Behavior Analyst (BCaBA) exam. This course covers the essential components of behavior change and specific behavior change procedures. Prerequisites: Pre- or Co-requisite: PSYC 3321

PSYC 4322 Applied Behavior Analysis II
Credit: 3 | Lecture: 3 | Lab: 0
Third course in a 4-course sequence to prepare students for the Board Certified Assistant Behavior Analyst (BCaBA) exam. Topics include: use of learning principles in applied areas such as education, business, health and human services, behavior change systems and management; and professional issues in behavior analysis. Prerequisites: Pre or Co-requisite: PSYC 3321
Prerequisites: Pre or Co-requisite: PSYC 3321
PSYC 4323 Research and Practice in Behavior Analysis
Credit: 3 | Lecture: 3 | Lab: 0
This course covers data analysis, research methods, ethics, and professional issues in behavior analysis. The course also will help prepare students to sit for the Board Certified Assistant Behavior Analyst (BCaBA) exam. Pre- or Co-requisite: PSYC 3321.
Prerequisites: Pre- or Co-requisite: PSYC 3321.

PSYC 4327 Practicum in Applied Behavior Analysis
Credit: 3 | Lecture: 3 | Lab: 0
Supervised application of behavioral principals and methods in community settings. Students may enroll in this course twice.
Prerequisites: Pre- or Co-requisites: PSYC 3321

PSYC 4332 Psychology of Work
Credit: 3 | Lecture: 3 | Lab: 0
Overview of the issues, problems, and practices in industrial/organizational psychology. Topics include work group dynamics, attitudes, job analysis, employee selection, performance appraisal, training, and organizational development.

PSYC 4334 Psychology of Women
Credit: 3 | Lecture: 3 | Lab: 0
The development of sex differences and sex roles; modern viewpoints on gender-appropriate behavior. Women’s Studies Course.

PSYC 4341 Human Factors Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Covers how users should be included in design process including need analysis, requirements writing, iterative testing of low/medium/high fidelity prototype, and implementation.

PSYC 4348 Development of Gender and Racial Identity
Credit: 3 | Lecture: 3 | Lab: 0
Explores how children and adolescents come to understand gender and race and with their changing understanding, how they incorporate gender and race into their self-concept, and use them to define/categorize others.

PSYC 4349 Psychology of Latina/os in the U.S.
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the ways gender, race, culture, immigration, and social class shape the psychology of Latina/os in the United States. The course will consider identity development as a psychological construct and will explore identity formation of individual Latina/os as well as group identity for multiple sub-groups of Latina/os (e.g., Mexican, Puerto Rican, Cuban, Dominican, etc.)

PSYC 4356 The Aging Experience
Credit: 3 | Lecture: 3 | Lab: 0
Examines cross-cultural differences, retirement, generational issues, death and dying, and political and social implications of the aging experience for today’s and tomorrow’s elderly. (Cross-listed with SOCI 4356.)

PSYC 4370 Nonexperimental Methods and Statistics
Credit: 3 | Lecture: 3 | Lab: 0
This course will introduce you to the procedures for conducting non-experimental, correlational and qualitative, research in psychology. We will discuss nonexperimental methods and the appropriate procedures for analyzing nonexperimental data.
PSYC 4371 Experimental Methods and Statistics
Credit: 3 | Lecture: 3 | Lab: 0
This course will introduce you to the procedures for conducting experimental research in psychology. We will discuss the experimental method and the appropriate statistical procedures for analyzing experimental data.

PSYC 4375 Personal Stress Management
Credit: 3 | Lecture: 3 | Lab: 0
Various methodologies for stress management emphasizing personal applications.

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 4389 Independent Study in Psychology
Credit: 3 | Lecture: 3 | Lab: 0
Permission of instructor required. May be taken for 3 hours of credit. For 1 hour of Independent Study credit, students should enroll in PSYC 4189.

SENG Systems Engineering

SENG 4310 Introduction to Systems Engineering
Credit: 3 | Lecture: 3
Overview of the systems engineering discipline. Topics include the systems engineering process, fundamentals of engineering economy and an introduction to probability and expectation with systems engineering applications.
Prerequisites: MATH 2315

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 4317 Developing Content Literacy in the Bilingual Classroom  
Credit: 3 | Lecture: 3 | Lab: 0  
Methods of developing English literacy in the bilingual classroom content areas. Emphasis is on the relationship between native language and second language development.

SILC 4318 Linguistic Diversity in Young Children  
Credit: 3 | Lecture: 3 | Lab: 0  
The purpose of this course is to examine the language development of children from birth to age five. Emphasis is placed on first and second language acquisition, the role of the first language, and how second language development can be supported.

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 4389 Independent Study in Bilingual Education/ESL  
Credit: 3 | Lecture: 3 | Lab: 0  
Prerequisites: Approval of instructor and associate dean.

SILC 4391 Selected Topics in the Studies of Language and Culture  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by title each time course offered.

SOCI Sociology

SOCI 1301 Introduction to Sociology  
Credit: 3 | Lecture: 3 | Lab: 0  
The scientific study of human society, including ways in which groups, social institutions, and individuals affect each other. Causes of social stability and social change are explored through the application of various theoretical perspectives, key concepts, and related research methods of sociology. Analysis of social issues in their institutional context may include topics such as social stratification, gender, race/ethnicity, and deviance.

SOCI 1306 Social Problems  
Credit: 3 | Lecture: 3 | Lab: 0  
Application of sociological principles and theoretical perspectives to major social problems in contemporary society such as inequality, crime, and violence, substance abuse, environmental issues, deviance, or family problems.

SOCI 2301 Intro to Social Work  
Credit: 3 | Lecture: 3 | Lab: 0  
Lower Level Sociology Elective
SOCI 2319 Multi-Cultural Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Lower Level Sociology Elective

SOCI 3312 Criminology  
Credit: 3 | Lecture: 3 | Lab: 0  
Theories of causation, patterns, and social response.

SOCI 3316 Global Sociology  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the way the worldwide process of globalization is connected to local economic, political, and cultural practices and identities.

SOCI 3317 Religion and Immigration Studies in Houston  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will explore the religious diversity of Houston. Of particular interest is the diversity of religious practices new immigrants bring with them to the U.S. This diversity is not limited to variations across religious traditions but diversity within religious traditions as well. (Cross-listed with SOCI 5233.)

SOCI 3335 Deviance  
Credit: 3 | Lecture: 3 | Lab: 0  
Theories of the existence of deviance in society; management of spoiled identities.

SOCI 3351 Political Sociology  
Credit: 3 | Lecture: 3 | Lab: 0  
The social bases of power; strategies for developing political influence; focus of power in America; relations between citizens and authorities; problems of political legitimacy.

SOCI 3352 Urban Sociology  
Credit: 3 | Lecture: 3 | Lab: 0  
The social organization of urban life and the structure of power in communities; urban problems and strategies for change.

SOCI 4306 Service Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
Service Learning is a course designed for students to take an active part in organized experiences that meet actual community needs combined with academic instruction, focusing on critical, reflective thinking and personal and civic responsibility. This course will involve students in activities that address community-identified needs with service integrating academic skills.

SOCI 4308 Perspectives in Women's and Gender Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Interdisciplinary topics course in women's and gender studies, topic to be determined by instructor at time of offering. Introduces students to analytical concepts and critical approaches for understanding the lives of women and the construction of gender within larger social, political, and cultural structures.

SOCI 4311 Social Psychology  
Credit: 3 | Lecture: 3 | Lab: 0  
Conformity, mass communication and propaganda, self-justification, prejudice, human aggression, attraction, cooperation and competition theory, research, and application. (Cross-listed with PSYC 4311.)
SOCI 4312 Social Structure: Class, Power, and Status
Credit: 3 | Lecture: 3 | Lab: 0
Various interpretations of America's system of social stratification.

SOCI 4313 Juvenile Delinquency
Credit: 3 | Lecture: 3 | Lab: 0
Individual and community aspects of juvenile delinquency; theories of causes and modes of control.

SOCI 4316 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. (Cross-listed with WGST 4316.)

SOCI 4317 Race and the Law
Credit: 3 | Lecture: 3 | Lab: 0
Evolution of legal rights of race/ethnic groups in U.S. from a sociological perspective. Examination of civil rights movement, hate crimes, and Affirmative Action policy.

SOCI 4322 Theories of Society
Credit: 3 | Lecture: 3 | Lab: 0
A review of historical and contemporary statements on the nature of society by philosophers and scientists.

SOCI 4323 Religion in Society
Credit: 3 | Lecture: 3 | Lab: 0
Examination of the major theories of religion in society and empirical research on religious membership and participation; study of issues such as secularization and the role of religion in modern society.

SOCI 4324 Organizations in Society
Credit: 3 | Lecture: 3 | Lab: 0
Study of several aspects of our organizational society such as roles, power, and membership; investigation of many types of organizations and their influence on individuals.

SOCI 4328 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 community groups, courts, churches, businesses, and non-governmental agencies.

SOCI 4329 Egypt in Transition
Credit: 3 | Lecture: 3 | Lab: 0
Course will expose students to culture, history, religion, and politics of Egypt and the Middle East. It explores sociological, historical, and cross-cultural forces shaping modern Egypt.

SOCI 4330 Cultural Study Abroad
Credit: 3 | Lecture: 3 | Lab: 0
Course will expose students to culture, history, religion, and politics of another country. Involves foreign travel and includes prerequisite of semester-long course focusing on the study-abroad country. Permission of instructor required.

SOCI 4331 Prison and Society
Credit: 3 | Lecture: 3 | Lab: 0
Correctional institutions in the United States; analysis of their changing roles and functions.
SOCI 4332 Sociology of Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of the classic confrontation between the rights of the individual and the welfare of the greater society and an examination of the most emotionally charged and problematic issues from the perspectives of sociological, philosophical, and legal theories.

SOCI 4334 Criminal Law  
Credit: 3 | Lecture: 3 | Lab: 0  
Survey of structure and rationale for criminal law; topics include criminal liability, criminal defenses, and types of offenses.

SOCI 4335 Social Change and Social Movements  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will explore macrosocial historical change in American society through protest, innovation, and social movements.

SOCI 4341 Women in Society  
Credit: 3 | Lecture: 3 | Lab: 0  
A cross-cultural study of the environment, biological and cultural factors in the division of labor and assignment of roles, male and female. Women's Studies Course (Cross-listed with ANTH 4341 and WGST 4341).

SOCI 4343 Public Service Management  
Credit: 3 | Lecture: 3 | Lab: 0  
Overview of basic theories of administrative organization, relationships, and behavior. How to structure, manage, direct, and control units within governmental organizations. (Cross-listed with PSLD 4343.)

SOCI 4344 Public Service Leadership  
Credit: 3 | Lecture: 3 | Lab: 0  
Examination of determinants and consequences of effective and ineffective leadership in non-profit and governmental organizations. (Cross-listed with PSLD 4344.)

SOCI 4355 Minorities in America  
Credit: 3 | Lecture: 3 | Lab: 0  
Economic, political, and social status of minority subcultures; the changing nature of minority/majority relations. May include Women's Studies content.

SOCI 4356 The Aging Experience  
Credit: 3 | Lecture: 3 | Lab: 0  
Examines cross-cultural differences, retirement, generational issues, death and dying, and political and social implications of the aging experience for today's and tomorrow's elderly. (Cross-listed with PSYC 4356.)

SOCI 4357 Sociology of Family, Work, and Gender  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of the competing responsibilities of market work and family work in the contemporary United States and the role gender has on both domains.

SOCI 4358 Family and Society  
Credit: 3 | Lecture: 3 | Lab: 0  
Social and legal foundations of the family as an institution, examined in the context of marriage, sex roles, and child rearing.

SOCI 4359 Family Policy  
Credit: 3 | Lecture: 3 | Lab: 0  
An in-depth examination of family policy in the U.S. and the tools to analyze critically any family policy.
SOCI 4363 American Immigration and the Immigrant Experience  
Credit: 3 | Lecture: 3 | Lab: 0  
Examines the history of American immigration with particular emphasis on Asian and Hispanic/Latino migration and explores sociological issues surrounding the contemporary immigration debate in the U.S.

SOCI 4364 Medical Sociology  
Credit: 3 | Lecture: 3 | Lab: 0  
Examines the sociological dimensions of health, illness, and healing, focusing on health disparities, social causes of health and illness, illness and identity, and the organization and delivery of health care in the U.S. and beyond.

SOCI 4365 Sociology of Mental Health and Illness  
Credit: 3 | Lecture: 3 | Lab: 0  
An introduction to theoretical and substantive issues concerning mental health and illness, including historical perspectives, current patterns of health and illness, help-seeking behavior, and identity and labeling.

SOCI 4367 Women's Health and Sexuality  
Credit: 3 | Lecture: 3 | Lab: 0  
Focuses on social factors that affect women's health, health care, and medical attitudes toward the female body. We will also explore how social and policy changes can improve or threaten women's health. (Cross-listed with WGST 4335.)

SOCI 4384 Statistics  
Credit: 3 | Lecture: 3 | Lab: 1  
Teaches students how to use, understand, and conduct data analysis.  
Prerequisites: College Algebra.

SOCI 4385 Research Methods  
Credit: 3 | Lecture: 3 | Lab: 0  
Teaches students how to design, understand, evaluate, and conduct various forms of social research. Students are encouraged to take Research Methods before taking Statistics.  
Prerequisites: College Algebra.

SOCI 4389 Independent Study in Sociology  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

SOCI 4391 Selected Topics in Sociology  
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.

SPAN Spanish

SPAN 1311 Beginning Spanish I  
Credit: 3 | Lecture: 3 | Lab: 0  
Spanish language skills in listening, speaking, reading and writing within a cultural framework. Students will acquire the vocabulary and grammatical structures necessary to communicate and comprehend at the beginner level.

SPAN 1312 Beginning Spanish II  
Credit: 3 | Lecture: 3 | Lab: 0  
Continued development of basic Spanish language skills in listening, speaking, reading, and writing within a cultural framework. Students acquire the vocabulary and grammatical structures necessary to communicate and comprehend at the high beginner to low intermediate level.
SPAN 2311 Intermediate Spanish I  
Credit: 3 | Lecture: 3 | Lab: 0  
The consolidation of skills acquired at the introductory level. Further development of proficiency in listening, speaking, reading, and writing. Emphasis on comprehension, appreciation, and interpretation of the cultures of the Spanish-speaking world.

SPAN 2312 Intermediate Spanish II  
Credit: 3 | Lecture: 3 | Lab: 0  
The consolidation of skills acquired at the introductory level. Further development of proficiency in listening, speaking, reading, and writing. Emphasis on comprehension, appreciation, and interpretation of the cultures of the Spanish-speaking world.

SPAN 3311 Intensive Spanish II  
Credit: 3 | Lecture: 3 | Lab: 0  
Focus on the intensive study of spoken and written language to facilitate spontaneity of expression.  
Prerequisites: 2000-level Spanish or the equivalent.

SPAN 3312 Intensive Spanish III  
Credit: 3 | Lecture: 3 | Lab: 0  
Focus on the intensive study of spoken and written language to facilitate spontaneity of expression.  
Prerequisites: SPAN 3311 or the equivalent.

SPAN 4391 Selected Topics in Spanish  
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.

SPED Special Education  

SPED 2301 Introduction to Special Populations  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides foundational knowledge of various categories of disabilities and its effects on different variables to include the perspectives of gender, socioeconomic status, cultural responsiveness, and access to the general education curriculum.  
Prerequisites: TCED 1301

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.
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 4332 Early Childhood Special Education
Credit: 3 | Lecture: 3 | Lab: 0
This course provides a comprehensive overview of early childhood special education. Content integrates theory, law, research, and current evidence-based practices associated with serving young children (birth through age eight), who present a wide range of special needs. Emphasis of content is on early childhood programs associated with public schools. Field experience is required.
Prerequisites: SPED 2301

SPED 4333 Advanced Early Childhood Special Education
Credit: 3 | Lecture: 3 | Lab: 0
This course will extend key topics in early childhood special education presented in the SPED 4332/ECED 4332 course, specifically strategies and techniques used by practitioners in early childhood special education settings serving children birth to age five.

SPED 4377 Practicum in Special Education for Young Children
Credit: 3 | Lecture: 3 | Lab: 0
Fieldwork with infants and/or young children with special needs to include school-based, agency-based or private programs.
Prerequisites: Completion of all prior coursework for the Early Childhood Handicapped Endorsement.

SPED 4389 Independent Study of Individual Differences
Credit: 3 | Lecture: 3 | Lab: 0
Prerequisites: Approval of instructor and associate dean.

SPED 4391 Selected Topics in Special Education
Credit: 3 | Lecture: 3 | Lab: 0
Identified by specific title each time course is offered.
STAT Statistics

STAT 1342 Elementary Statistical Methods
Credit: 3 | Lecture: 3
Collection, analysis, presentation and interpretation of data; probability, sampling, correlation and regression, analysis of variance and the use of statistical software. Not available for mathematics majors.
Prerequisites: Meet TSI college-readiness standard for Mathematics; or equivalent.

STAT 3308 Computational Statistics
Credit: 3 | Lecture: 3
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 4315 Applied Statistical Methods
Credit: 3 | Lecture: 3
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.
Prerequisites: STAT 3308 or equivalent.

STAT 4326 Introduction to Survey Sampling
Credit: 3 | Lecture: 3
An introduction to the design of sample surveys and the analysis of survey data. This course emphasizes practical applications of survey methodology. Sample designs covered include simple random sampling, systematic sampling, stratified, cluster and multistage sampling. Analytical methods include sample size determination, ratio and regression estimation and imputation for missing data.
Prerequisites: Consent of Instructor

STAT 4328 Introduction to Statistical Computing Packages
Credit: 3 | Lecture: 3
An introduction to the statistical computing packages, such as Microsoft Excel, Minitab, R, SAS, etc. The course will focus on basic data display (including various plots and tables) and fundamental statistical analysis, such as one and two-sample hypothesis test, simply analysis of variance, simple regression data analysis.
Prerequisites: MATH 2413
STAT 4333 Statistical Computing
Credit: 3 | Lecture: 3 | Lab: 0
Introduction to SAS and R; topics include data management, reporting, graphical displays, macros, statistical analysis and interpretation and related topics.
Prerequisites: MATH/STAT 4345 or instructor approval.

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 4346 Probability for Actuarial Exam P1
Credit: 3 | Lecture: 3
This course is designed to help students prepare for the first actuarial exam preparation. This course consists of introducing/ reviewing concepts and rules of probability and statistics and studying sample actuarial examinations and related material. Students are given sample problems from past actuarial examinations to study outside of class. The solution of these problems and related material are discussed in class.
Prerequisites: MATH/STAT 4344

STAT 4348 Introduction to Financial Math for Exam FM
Credit: 3 | Lecture: 3
This course is designed to help students prepare for the second actuarial exam preparation. This course consists of introducing the basics of sample interest and discount, compound interest and discount and simple annuities and studying sample actuarial examinations and related material. Students are given sample problems from past actuarial examinations to study outside of class. The solution of these problems and related material are discussed in class.
Prerequisites: MATH 2413

STAT 4350 Financial Economics
Credit: 3 | Lecture: 3
A mathematical insight of some fundamental concepts of financial mathematics and financial economics and their application to real world business situations and basic risk management. An introduction to mathematical approach to understanding stochastic calculus, asset pricing, hedging and portfolio theory.
Prerequisites: MATH/STAT 4344
SWEN Software Engineering

SWEN 3314 Interface Engineering
Credit: 3 | Lecture: 3 | Lab: 0
The user interface of a software product is a key factor which determines whether a software project succeeds or fails. This course assesses current UI design issues and explores innovative approaches to UI design in terms of cognitive engineering, human perception, attention and language. The intent is to develop new design methodologies, experimenting with new hardware devices, prototyping new software systems, exploring new paradigms for interaction and developing models and theories of interaction.
Prerequisites: CSCI 2315

SWEN 3320 Engineering Multimedia Software
Credit: 3 | Lecture: 3
Course examines object-oriented design and development of multimedia software. At a high level, the course examines the physics, biology and psychology of visual and auditory perception and the implications of these processes for the characterization of multimedia software. At an intermediate level, it discusses the use of various patterns in the design of multimedia software. At a lower level, it discusses different ways of adding multimedia functionality to applications with visual and auditory examples (such as image processing, vector graphics, video, animation, audio processing and musical scores.
Prerequisites: CSCI 1370 or CSCI 1471

SWEN 3340 Principles of Engineering Software
Credit: 3 | Lecture: 3
Study of software design models and as well as implementation techniques. Design patterns, frameworks, architecture design and component-based design. Designing for qualities such as performance, safety, security, reusability, reliability, etc. is covered as well as principles of OO design and OO analysis using UML (Unified Modeling Language). Introduction to topics of aspect oriented design, model-driven architectures and service-oriented architectures.
Prerequisites: SWEN 3350 or CSCI 2315

SWEN 3350 Data Structures for Software Engineering
Credit: 3 | Lecture: 3
This course will study the design and implementation issues surrounding the common data structures including arrays, linked lists, queues and stacks; abstract data types, binary trees, binary search trees, heaps, hashing techniques, recursion, as well as the implementation of searching and sorting algorithms.
Prerequisites: CSCI 1320 or CSCI 1370 or equivalent

SWEN 4195 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.
SWEN 4314 Interface Engineering  
Credit: 3 | Lecture: 3  
The user interface of a software product is a key factor which determines whether a software project succeeds or fails. This course assesses current UI design issues and explores innovative approaches to UI design in terms of cognitive engineering, human perception, attention and language. The intent is to develop new design methodologies, experimenting with new hardware devices, prototyping new software systems, exploring new paradigms for interaction and developing models and theories of interaction.  
Prerequisites: CSCI 2315.

SWEN 4317 Introduction to Game Design and Development  
Credit: 3 | Lecture: 3  
Principles of game design and development of software for computer gaming.  
Prerequisites: CSCI 2315

SWEN 4318 Virtual Worlds, Sims and Animation Scripting  
Credit: 3 | Lecture: 3  
This is a project-based course that explores the design and development of Virtual Worlds and Sims using 3-D graphic software and animation scripting. Development work will include oral presentations, peer reviews and project documentation. Students will need their own laptop and may be required to purchase special software.  
Prerequisites: CSCI 2315 and proficiency in programming.

SWEN 4320 Introduction to Software Process and Project Management  
Credit: 3 | Lecture: 3  
Introduction to Software Process Models, process modeling and improvement; project planning, scheduling and project management.  
Prerequisites: CSCI 2315.

SWEN 4330 Software Development in Emerging Domains  
Credit: 3 | Lecture: 3  
Design and implementation of software in emerging new fields of interest. Topics will include software development in robotics and cell phone applications (apps).  
Prerequisites: SWEN 3320, SWEN 3340.

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: CSCI 2315 or equivalent

SWEN 4343 Current Tools and Innovative Technologies  
Credit: 3 | Lecture: 3  
Review of current software engineering tools used in various lifecycle phases in traditional and novel domains. Survey of current and future trends in software engineering including evidence-based software engineering. Course will involve team work on small projects and oral presentation and project report writing.  
Prerequisites: CSCI 2315 and one of (CSCI 1370 or CSCI 3311 or equivalent).
SWEN 4345 Introduction to Personal Software Process
Credit: 3 | Lecture: 3
Personal evaluation and practice of the software design process, assessments, modeling and improving techniques.
*Prerequisites: CSCI 1320 or CSCI 1470 or equivalent.*

SWEN 4346 Software Testing
Credit: 3 | Lecture: 3 | Lab: 0
Current and traditional testing techniques will be explored and exercised, including but not limited to black box testing, white box, equivalence partitioning, recurrence testing, validation testing, as well as validation and verification techniques. Integrated Laboratory instruction.
*Prerequisites: CSCI 2315*

SWEN 4365 Senior Project I
Credit: 3 | Lecture: 3
Student must be in last year of study before graduation. Students will research a project topic in a chosen area. Students will be exposed to the process of research by writing a proposal for their senior project based on this research and preliminary and high-level designs submitted. Project proposals and design will go through a series of peer reviews with oral presentations and written reports required. Approved project proposals will be developed in Senior Project II.  
*Prerequisites: Approval of instructor.*

SWEN 4366 Senior Project II
Credit: 3 | Lecture: 3
Projects accepted and begun in Senior Project I are continued to completion in Senior Project II. Periodic presentation and peer reviews are required throughout the semester. A prototype implementation, a technical report and a public presentation are required at minimum at the end of semester.  
*Prerequisites: SWEN 4365 and approval of instructor.*

SWEN 4391 Research Topics in SWEN
Credit: 3 | Lecture: 3
Identified by specific title each time course is offered.

SWRK Social Work

SWRK 3301 Introduction to Social Work
Credit: 3 | Lecture: 3 | Lab: 0
Overview of the field of social work, including history, philosophy, values, roles, fields of practice, and settings for professional social work practice. Students are exposed to the Bio-Psycho-Social approach to practice. Students are required to complete a 40-hour volunteer service-learning placement.

SWRK 3304 Issues and Ethics in Social Work
Credit: 3 | Lecture: 3 | Lab: 0
Examination of professional values and behaviors specific to social work as set forth in NASW Code of Ethics and various other codes of ethics for social work professionals.
SWRK 3314 Diversity and Human Behavior in the Social Environment  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
First of two courses on human behavior and the social environment. Overview of theories and knowledge related to human behavior, growth, and development throughout the life cycle with particular attention to human diversity.  
*Prerequisites:* Pre- or Co-requisites: SWRK 3301 and SWRK 3304

SWRK 3317 Social Welfare Policy and Services  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Examination of the history and current patterns of provision of domestic and international social welfare policies and services as well as the effect of policy on social work practice. Overview of the role of social policy in helping or deterring people in maintaining or achieving optimal health and well-being and the impact of policy on client systems of all sizes is included.  
*Prerequisites:* Pre- or Co-requisite: SWRK 3301 and SWRK 3304

SWRK 3324 Oppression, Diversity, and Social Justice  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Overview of theories and knowledge related to social, cultural, and systemic influences on human behavior with particular attention to social and economic justice and persons and groups most affected by oppression.  
*Prerequisites:* Pre- or Co-requisite: SWRK 3301, and SWRK 3304

SWRK 4318 Social Work Practice I  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Introduction to theories, skills, values, and techniques for social work assessment, intervention, and practice evaluation with individuals with particular attention to human diversity and multicultural responsiveness. Only available to students admitted to the BSW program or students who have declared a minor in Social Work.  
*Prerequisites:* SWRK 3301, SWRK 3304, SWRK 3314, and SWRK 3324; all with a "C" or better. Preferably completion of Overview Requirements (Psychology, Sociology, and/or Anthropology).

SWRK 4319 Social Welfare Policy Analysis  
**Credit:** 3 | **Lecture:** 0 | **Lab:** 0  
Examination of social welfare policy perspectives, models of policy analysis, and contemporary social service/welfare policies. Special emphasis is placed on the skills of policy analysis as a means to achieving social and economic justice for oppressed groups within the context of historical and contemporary factors that shape policy. Only available to students admitted to the BSW program.  
*Prerequisites:* SWRK 4317 with a "C" or better.

SWRK 4328 Social Work Practice II  
**Credit:** 3 | **Lecture:** 3 | **Lab:** 0  
Introduction to theories, skills, values, and techniques for social work assessment, intervention, and practice evaluation with groups and families with particular attention to human diversity and multicultural responsiveness. Only available to students admitted to the BSW program.  
*Prerequisites:* SWRK 4318 with a "C" or better.
SWRK 4338 Social Work Practice III  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to theories, skills, values, and techniques for social work assessment, intervention, planned change, and practice evaluation with communities and organizations. Only available to students admitted to the BSW program.  
Prerequisites: SWRK 4318 with a "C" or better.

SWRK 4363 Experimental Methods and Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will introduce you to the procedures for conducting experimental research. We will discuss the experimental method and the appropriate statistical procedures for analyzing experimental data.

SWRK 4370 Nonexperimental Methods and Statistics  
Credit: 3 | Lecture: 3 | Lab: 0  
This course will introduce you to the procedures for conducting nonexperimental, correlational and qualitative research. We will discuss nonexperimental methods and the appropriate procedures for analyzing nonexperimental data.

SWRK 4389 Independent Study in Social Work  
Credit: 3 | Lecture: 0 | Lab: 0  
Permission of instructor required.

SWRK 4391 Selected Topics in Social Work  
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.

SWRK 4619 Social Work Internship I  
Credit: 6  
First of two consecutive 240-hour generalist social work practice field placements. Requires participation in the Integrative Seminar. Students must have applied for and been accepted into a field placement with the Social Work program in order to register for this course.  
Prerequisites: All other coursework must be completed with a "C" or better. Must have approval of the BSW Program and Field Director. Students may be concurrently enrolled in SWRK 4319 and/or Interdisciplinary Overviews. Any variations require prior approval of the Director of Field Education.

SWRK 4629 Social Work Internship II  
Credit: 6 | Lecture: 0 | Lab: 0  
Second of two consecutive 240-hour generalist social work practice field placements.  
Prerequisites: All other coursework must be completed. Must have approval of BSW faculty.

TCED Teacher Education

TCED 1101 Inquiry Approaches to Teaching Mathematics and Science Step I  
Credit: 1 | Lecture: 1 | Lab: 0  
Introduction to mathematics and science teaching as a career. Discussions include standards-based lesson design and various teaching and behavior management strategies. Fieldwork consists of planning and teaching three inquiry-based lessons to students in grades three to five in local elementary schools. Every semester. Field component required.
TCED 1102 Inquiry Based Lesson Design in Mathematics and Science Step II  
Credit: 1 | Lecture: 1 | Lab: 0  
Topics may include routes to teacher certification in mathematics and science teaching; various teaching methods that are designed to meet instructional goals; and learner outcomes. Students develop and teach three inquiry-based lessons in their field in a middle school, and participate in peer coaching. Every semester. Field component.  
**Prerequisites:** TCED 1101 with a grade of at least C or consent of UHCLTeach Co-Director.

TCED 1301 Exploring Teaching as a Profession  
Credit: 3 | Lecture: 3 | Lab: 0  
This course provides an introduction to the teaching profession and course content is aligned to the State Board for Educator Certification Pedagogy and Professional Responsibilities Standards. Field experiences required.

TCED 1306 Relational Aspects of Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
The social interaction and relational aspects of learning are explored in this course. Various interactional styles and supportive surveys are presented. Discussions are conducted regarding how these aspects of the affective domain of learning impact learner progress in the current public educational system. Observations of teachers interacting with learners in the school are included as reflection points of course papers. Field experience is required.

TCED 2301 Knowing and Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
Psychological foundations of learning; problem solving in mathematics and science education utilizing technology; principles of expertise and novice understanding of subject matter; implications of high stakes testing; and foundations of formative and summative assessment. Fall and spring semesters. No credit toward Education degree.  
**Prerequisites:** Admission to the UHCLTeach program; university, STEM and major department grade point average of at least 2.5; TCED 1102 with a grade of at least C or consent of UHCLTeach Co-Director.

TCED 2302 Questioning Strategies to Promote Learning  
Credit: 3 | Lecture: 3 | Lab: 0  
Various types of questions and the purpose of different questioning strategies are present in the course. Assignments that demonstrate application of questioning strategies through simulations with peers are utilized. In-class discussions on the effectiveness of various questioning strategies will be conducted, as well as, individual research on identified topics related to Bloom's Taxonomy.
TCED 2303 Classroom Interactions  
Credit: 3 | Lecture: 3 | Lab: 0  
Principles of delivering effective instruction in various formats (lecture, lab, cooperative settings, examination of diversity including gender, class, race, exceptionalities, and culture in mathematics and science education; overview of policy related to mathematics and science education. Fall and Spring semesters. Field component. No credit toward Education degree.  
Prerequisites: Admission to the UHCLTeach program; university, UHCLTeach, and major department grade point averages of at least 2.5; TCED 2301 with a grade of at least C or consent of UHCLTeach Co-Director. May not be used for graduate credit.

TCED 3300 Perspectives on Science and Math  
Credit: 3 | Lecture: 3 | Lab: 0  
Introduction to the historical, social and philosophical implications of mathematics and science through investigations of pivotal experiments and findings. Fall and spring semesters. No credit toward Education degree.  
Prerequisites: Admission to the UHCLTeach program; university, TCED, and major department grade point averages of at least 2.5; ENGL 1020 and completion of all 1000-level major courses with a grade of at least C; TCED 2302 with a grade of at least C or consent of UHCLTeach Co-Director.

TCED 3301 Research Methods in Science  
Credit: 3 | Lecture: 3 | Lab: 0  
Recent developments and research methods in science. Fall and spring semesters. For UHCLTeach students only; no credit toward Education degree.  
Prerequisites: Admission to the UHCLTeach program; university, TCED, and major department grade point averages of at least 2.5, an approved General Education statistics course and completion of all 1000-level major courses with a grade of at least C; TCED 2302 with a grade of at least C or consent of Co-Director.

TCED 3302 Instructional Practices in Education  
Credit: 3 | Lecture: 3 | Lab: 0  
This course presents an overview of instructional practices used in public education. Observations of lessons taught by veteran teachers in the schools are included to build conceptual and experiential knowledge of common pedagogy. Critical examination of effectiveness of instructional practices is explored through discussion and assignments. Field experience required.

TCED 3304 Social Justice and Critical Issues in Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Coverage of social issues that currently exist in public schools will be presented and discussed. Socratic discussion circles will serve as one format for exploring issues. Critical examination of potential unexamined biases within learners' own world views are central to course coverage. Reflection in positional papers serve as main assignments.
TCED 4079 Post-Degree Internship in Teaching
Credit: 0 | Lecture: 0 | Lab: 0
This internship is restricted to members of UHCL’s Alternative Certification Program. Field experiences required in a public school setting. Prerequisites: TCED 4678 and TCED 4679 and approval of the associate dean.

TCED 4100 Core Subjects Teacher Seminar
Credit: 1 | Lecture: 1 | Lab: 0
This course is designed to assist EC-6 and 4-8 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 meeting syllabus requirements.

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 candidate meeting syllabus requirements.

TCED 4300 Project Based Instruction
Credit: 3 | Lecture: 3 | Lab: 0
Foundations of project-based, case-based, and problem-based learning environments; principles of project-based curriculum development in mathematics and science education; classroom management and organization of project-based learning classrooms. Spring and Fall semesters. Field component. No credit toward Education degree. Prerequisites: Admission to UHCLTeach program; university, UHCLTeach, and major department grade point averages of at least 2.5; TCED 3301 with a grade of at least C or consent of UHCLTeach Co-Director. Not for graduate credit.

TCED 4302 Inquiry Processes and Problem Solving Skills in Education
Credit: 3 | Lecture: 3 | Lab: 0
Various inquiry thinking processes and problem solving skills are explored through actual application exercises in class. Different levels of cognitive development are presented as foundational information that impacts learner readiness for certain thinking processes. Individual research on an inquiry process or problem skill is required.

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.
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.

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.

TCED 4308 Assessments and Testing in Schools
Credit: 3 | Lecture: 3 | Lab: 0
Different types of formative and summative assessments currently used in public education and covered in the course. Additionally, an overview of the types of tests used in local school districts and how they are utilized by educators to measure learner progress is presented and discussed. Mock tests and assessments will provide experiential knowledge of the purpose and impacts of diverse testing designs.

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

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 4364 Methods in Technology  
Credit: 3 | Lecture: 3 | Lab: 0  
Strategies for teaching technology applications; emphasis on instructional techniques, development of problem-solving skills and issues and trends in technology applications. Field experiences required.  
**Prerequisites:** Admission to Teacher Education Program, successful completion of or concurrent enrollment in TCED 4306.

TCED 4377 THECB Aide Project  
Credit: 3 | Lecture: 3 | Lab: 0  
Supervised field project under the joint supervision of a public school district and the UHCL Center for Professional Development of Teachers. Student must be enrolled in the Texas Higher Education Coordinating Board (THECB) Aide Project. Field experiences required in a public school setting.  
**Prerequisites:** Admission to Teacher Education Program and approval of the associate dean.

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 4389 Independent Study in Teacher Education  
Credit: 3 | Lecture: 3 | Lab: 0  
**Prerequisites:** Approval of instructor and associate dean.

TCED 4391 Selected Topics in Teacher Education  
Credit: 3 | Lecture: 3 | Lab: 0  
Identified by title each time course is offered.

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:** Approval of associate dean.
TCED 4700 Apprentice Teaching and Seminar  
Credit: 7 | Lecture: 3 | Lab: 0  
Apprentice Teaching: Closely supervised fieldwork in cooperating school. Experience includes carrying out the duties of a secondary teacher. Twenty hours of fieldwork a week for one semester. Offered on a pass/fail basis only. Every semester. No credit toward Education degree. Field component. Student Teaching Seminar restricted to students in the UHCLTeach program who have earned a passing score on the preliminary portfolio. Discussions include student teaching experiences and contemporary critical issues in education. One lecture hour a week. Fall and Spring semesters. For UHCLTeach students only; not open to Education students. Prerequisite: Admission to UHCLTeach program, a university grade point average of at least 2.50, all UHCLTeach courses successfully completed, 90% of content exam courses, application for and admission to UHCLTeach Apprentice Teaching according to UHCLTeach guidelines, passing and score submission to UHCLTeach of all relevant state certification examinations, approval of preliminary portfolio by UHCLTeach, consent of UHCLTeach adviser. May not be used for graduate credit.  
Prerequisites: Successful completion of Checkpoint 3 and all but at most two content courses successfully completed and a passing score on preliminary portfolio.

TCED 4978 Pre-Service Internship II/Clinical Teaching  
Credit: 9 | Lecture: 9 | Lab: 0  
Internship II/Clinical teaching will provide Interns with experiences that will assist in the development and application of knowledge, skills and dispositions to continue their growth and development as new teachers. Interns will participate in ALL aspects of the professional role of teachers, including, but not limited to: professional committees and meetings, monitoring duty (cafeteria, bus lines, etc.), parent and student conferencing, extracurricular activities with prior approval of the District Supervisor, and other assigned professional duties. During the Internship II/Clinical teaching semester, the interns/clinical teachers will adhere to the instructional day of the PDS site Monday through Friday.  
Prerequisites: TCED 4378 and approval of the associate dean.

WGST Women’s and Gender Studies

WGST 1301 Gender Matters: Introduction to Women's and Gender Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
A general introduction to the study of women and gender across academic disciplines, appropriate as a first course for any student interested in the study of gender within their major. This course considers fundamental questions, such as: What is a woman? What is gender? What is sex? How does culture construct gender and gender difference? How do gender, race, class, ethnicity, and sexuality intersect?
WGST 3341 Women in American History
Credit: 3 | Lecture: 3 | Lab: 0
Exploration of diversity within the historical gender-specific experience of women's participation in and contributions to the history of the United States (Cross-listed with HIST 3341.)

WGST 4189 Independent Study in Women's and Gender Studies
Credit: 1 | Lecture: 0 | Lab: 0
Permission of instructor required. May be taken for 1 hour of credit. For 3 hours of Independent Study credit, students should enroll in WGST 4389.

WGST 4308 Perspectives in Women's and Gender Studies
Credit: 3 | Lecture: 3 | Lab: 0
Interdisciplinary topics course in women's and gender studies, topics to be determined by instructor at time of offering. Introduces students to analytical concepts and critical approaches for understanding the lives of women and the construction of gender within larger social, political, and cultural structures. Topics vary; may be repeated for credit with permission of instructor.

WGST 4312 Women of Color
Credit: 3 | Lecture: 3 | Lab: 0
Focuses on diverse experiences of women of color, using race, class, and sexuality as analytical tools to explore these experiences. Topics vary; may be repeated for credit with permission of instructor.

WGST 4314 Latina Social Movements in the Americas
Credit: 3 | Lecture: 3 | Lab: 0
This course invites students to use the historical record to imagine and analyze gender and the roles of women in Latin America.

WGST 4316 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 context of human rights law. Legal status of women in economic, political, and judicial sectors. (Cross-listed with SOCI 4316.)

WGST 4329 History of Feminism
Credit: 3 | Lecture: 3 | Lab: 0
Survey of the development of those reform movements and individuals who shaped the growth of feminism in the 19th- and 20th-century U.S. and the world. May focus on a particular aspect of historical feminism. (Cross-listed with HIST 4329.)

WGST 4334 Psychology of Women
Credit: 3 | Lecture: 3 | Lab: 0
Development of sex differences and sex roles; modern viewpoints on gender-appropriate behavior.

WGST 4335 Women's Health and Sexuality
Credit: 3 | Lecture: 3 | Lab: 0
Survey of current issues in women's health and sexuality using a life-span perspective. (Cross-listed with SOCI 4367.)
WGST 4337 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. (Cross-listed with PSYC 4337.)

WGST 4341 Women in Society  
Credit: 3 | Lecture: 3 | Lab: 0  
Cross-cultural study of the environmental, biological, and cultural factors in the division of labor and assignment of roles, male and female. (Cross-listed with ANTH 4341 and SOCI 4341.)

WGST 4348 Development of Gender and Racial Identity  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration of how children and adolescents come to understand gender and race, and with their changing understanding how they come to incorporate gender and race into their self-concept and use them to define/categorize others.

WGST 4360 Women in Literature  
Credit: 3 | Lecture: 3 | Lab: 0  
Heroines from Eve to Beloved; literature constructs the female; emphasis on 19th- and 20th-century works.

WGST 4370 Gender and Identity in the Visual Arts  
Credit: 3 | Lecture: 3 | Lab: 0  
History, theory, and criticism in relation to issues of gender, sexuality, and identity in the visual arts.

WGST 4372 Seminar in Women's and Gender Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
An advanced course in Women's and Gender Studies, designed to acquaint students with contemporary issues in scholarship on women's and gender studies across the disciplines. Topics may include feminist theories, methodologies, ethics, and philosophies. Prerequisites: Any previous course with Women's and Gender Studies content.

WGST 4389 Independent Study in Women's and Gender Studies  
Credit: 3 | Lecture: 3 | Lab: 0  
Permission of instructor required. May be taken for 3 hours of credit. For 1 hour of Independent Study credit, students should enroll in WGST 4189.

WGST 4391 Selected 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.

WRIT Writing

WRIT 1301 Composition I  
Credit: 3 | Lecture: 3 | Lab: 0  
Intensive study of and practice in writing processes, from invention and researching to drafting, revising, and editing, both individually and collaboratively. Emphasis on effective rhetorical choices, including audience, purpose, arrangement, and style. Focus on writing the academic essay as a vehicle for learning, communicating, and critical analysis.
WRIT 1302 Composition II
Credit: 3 | Lecture: 3 | Lab: 0
Intensive study of and practice in the strategies and techniques for developing research-based expository and persuasive texts. Emphasis on effective and ethical rhetorical inquiry, including primary and secondary research methods, critical reading of verbal, visual, and multimedia texts; systematic evaluation, synthesis, and documentation of information sources; and critical thinking about evidence and conclusions. 
Prerequisites: WRIT 1301 or equivalent.

WRIT 3304 Writing for Education
Credit: 3 | Lecture: 3 | Lab: 0
Frequent writing practice with the study of composition theories and strategies for writing as a professional educator. Introduces prospective teachers to methods for evaluating student writing and designing effective writing assignments and instructional materials. 
Prerequisites: WRIT 1301 and WRIT 1302 with a "C-" or better and junior-level standing.

WRIT 3305 Writing for the Humanities
Credit: 3 | Lecture: 3 | Lab: 0
Concentrated instruction in the research methods and writing conventions widely used in the humanities, liberal arts, and some social sciences. Careful understanding and interpretation of primary source materials and critical reading of secondary source materials. Strong focus on research. 
Prerequisites: WRIT 1301 and WRIT 1302 with a "C-" or better and junior level standing.

WRIT 3306 Writing for the Social Sciences
Credit: 3 | Lecture: 3 | Lab: 0
Designed specifically for students in psychology, social work, criminal justice, anthropology, fitness and human performance, women's studies, and other Social Sciences majors. Covers genres students can expect to encounter in both academic and professional writing situations including paraphrases, summaries, annotated bibliographies, and literature reviews. 
Prerequisites: WRIT 1301 and WRIT 1302 with a "C-" or better and junior level standing.

WRIT 3307 Advanced Writing
Credit: 3 | Lecture: 3 | Lab: 0
Explores invention of ideas to strategies appropriate to various kinds of writing. Models of organization, analysis of style, role and importance of mechanics and syntax. 
Prerequisites: Completion of WRIT 1301 and WRIT 1302 with a grade of C- or better and junior-level standing.

WRIT 3312 Written Communications in Business
Credit: 3 | Lecture: 3 | Lab: 0
Theory and practices of business communications: preparation of effective letters, policy statements, procedures, reports, and related documents. 
Prerequisites: Completion of WRIT 1301 and WRIT 1302 with a grade of C- or better and junior-level standing.
WRIT 3315 Advanced Technical Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Advanced approaches to the writing of technical documents for professional audiences: correspondence, proposal reports, manuals, and descriptions.  
Prerequisites: Completion of WRIT 1301 and WRIT 1302 with a grade of C- or better and junior-level standing.

WRIT 4310 Writing for the Public: Developing Non-Profit Communication Strategies  
Credit: 3 | Lecture: 3 | Lab: 0  
Exploration and implementation of the theories and practices of writing and rhetoric that serve the public interest. Focuses on the written and digital forms of communication important to non-profit organizations.  
Prerequisites: WRIT 1301 and WRIT 1302 with a C- or better and in junior-level standing.

WRIT 4311 Grant and Proposal Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
Project-based, service-learning course covering the complete process of grant proposal development: identification of an achievable and fundable project, research and assessment of viable funding sources, proposal writing, budget development, preparation of a full proposal package for submission, and post-award or rejection follow-up with funders.  
Prerequisites: WRIT 1301 and WRIT 1302 with a C or better and in junior standing.

WRIT 4312 The Rhetoric of Popular Culture  
Credit: 3 | Lecture: 3 | Lab: 0  
Combines rhetorical analysis with critical studies including Marxist, feminist, visual, and media-centered criticism and queer theory. Through these lenses, students will analyze movies, television, music, public speeches, advertising, and other media.  
Prerequisites: WRIT 1301 and WRIT 1302 with a C or better and in junior standing.

WRIT 4313 Graffiti, Texting, and Networked Politics: The Sociolinguistics of Writing  
Credit: 3 | Lecture: 3 | Lab: 0  
The study of writing as a sociolinguistic object. Examines a new sociolinguistics of globalization with a focus on mobility, multilingualism, and superdiversity.  
Prerequisites: WRIT 1301 and WRIT 1302 with a C or better and in junior standing.

WRIT 4314 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.

WRIT 4391 Selected Topics in Writing  
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.