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Accounting (ACC)

ACC 211 Principles of Accounting I 3 cr
The course provides an understanding of ways in which accounting information supports business decision-making. Topics include financial accounting and reporting for assets and liabilities. ACC 211 and ACC 212 must be taken in sequence.

ACC 212 Principles of Accounting II 3 cr
The course provides an understanding of ways in which accounting information supports business decision-making. Topics include financial accounting and reporting for ownership interests, and managerial accounting concepts relevant to planning, control and analysis. Pre-requisite: ACC 211 Minimum Grade of C.

ACC 310 Intro to Acc & Bus Software 3 cr
An introductory course in practical application and study of current accounting and business software. The course provides an overview of commonly used business and accounting software with practical applications. Pre-requisite: ACC 212 Minimum Grade of C.

ACC 321 Acct for Entrepreneurial Bus 3 cr
A study of the analysis and use of accounting information by entrepreneurial businesses. Among the topic covered are typical financing sources of entrepreneurial businesses and valuation of closely held businesses. In addition, the course includes coverage of how financial statements can be used to: manage a business, monitor an entity's performance, determine credit decisions, manage cash flow, and prepare forecasted financial statements. Pre-requisite: (ACC 212 Minimum Grade of C or BMS 212 Minimum Grade of D).

ACC 331 Taxation of Individuals 3 cr
Basic federal income tax law and tax planning considerations relating to individuals. Pre-requisite: ACC 212 Minimum Grade of C or BMS 212 Minimum Grade of C.

ACC 341 Accounting Information Systems 3 cr
The study of accounting as a comprehensive information system which provides for planning and control, special reports, and preparation of external financial statements. Pre-requisite: (ACC 212 Minimum Grade of C or BMS 212 Minimum Grade of D) and CIS 250 Minimum Grade of D.

ACC 371 Financial Accounting I 3 cr
Accounting theory as related to income measurement; preparation of balance sheets and income statements; recognition, measurement, and reporting of assets. Pre-requisite: ACC 212 Minimum Grade of C and (MA 112 Minimum Grade of C or MA 120 Minimum Grade of C).

ACC 372 Financial Accounting II 3 cr
Includes measurement, recognition and reporting of liabilities, equities, investments, and deferred taxes; EPS; and the preparation of cash flow statements. Coverage of selected professional pronouncements. Pre-requisite: ACC 313 Minimum Grade of C or ACC 371 Minimum Grade of C.

ACC 381 Cost Accounting 3 cr
Includes cost-accounting theory and practice involving such topics as job-order and process-cost systems, cost-volume-profit relationships, budgets, standard costs, variance analysis, direct costing, and cost allocation. Pre-requisite: (ACC 212 Minimum Grade of C or BMS 212 Minimum Grade of D).

ACC 410 Forensic Accounting 3 cr
An intro to principles for forensic accounting and professional ethics. Civil and criminal procedures and litigation services are covered. The courses introduces forensic accounting topics such as fraud, bankruptcy, digital forensics, and financial statement misrepresentation. Pre-requisite: ACC 372 Minimum Grade of C.

ACC 416 Int'l and Advanced Accounting 3 cr
Study of accounting in a global context including standards and issues and the roles and responsibilities of accountants. Additional topics include: business combinations, partnership accounting, interim and segmented reporting. Pre-requisite: ACC 314 Minimum Grade of C or ACC 372 Minimum Grade of C.

ACC 432 Tax of Partnerships and Corps 3 cr
An examination of the federal tax treatment of partnerships and corporations. Topics include: tax aspects of the formation of the entity, elements of gross income, treatment of property dispositions, allowable deductions and credits, determination of entity and investor basis, and liquidation of the entity. Pre-requisite: (ACC 331 Minimum Grade of C or ACC 411 Minimum Grade of D) and (ACC 314 Minimum Grade of C or ACC 372 Minimum Grade of C).
ACC 451 Auditing - W 3 cr
Theory and application of the attest function, ethical issues, and written communication for accountants. Includes standards, objectives, review of internal control structures, tests of controls, substantive testing and reporting. Ethical issues and the preparation of written letters and formal reports are covered.
Pre-requisite: (ACC 314 Minimum Grade of C or ACC 372 Minimum Grade of C) and MGT 305 Minimum Grade of D.

ACC 452 Advanced Auditing 3 cr
Advanced study of the application of Auditing Standards; internal control evaluations; applications of statistics; audits of EDP systems; internal and operational auditing; ethical, legal and reporting obligations.
Pre-requisite: ACC 451 Minimum Grade of C.

ACC 461 Acc for Gov and Not-For-Profit 3 cr
A study of the concepts and procedures underlying fund accounting, budgetary control, and financial reporting requirements for governmental and not-for-profit entities.
Pre-requisite: ACC 314 Minimum Grade of C or ACC 372 Minimum Grade of C.

ACC 490 Special Topics 3 cr
Designed to provide senior students an opportunity to study selected topics of particular interest. A student may count no more than six hours of Special Topics in the concentration.
Prerequisite: Approval of Department Chair.

ACC 494 Directed Studies 3 cr
Primarily designed to give superior students an opportunity to study some phase of accounting of particular interest. Conferences, a bibliography, and a formal research report are required. Requires permission of Department Chair, 2.5 GPA or better and junior or senior standing.

ACC 496 Accounting Internship 3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed projects under the supervision of Department Chair. No more than three hours of internship credit may be counted toward a degree in the Mitchell College of Business. Prerequisites: Junior or Senior standing, declared major in accounting, overall GPA of at least 2.5, and Internship Agreement signed by department Chair.
Pre-requisite: ACC 314 Minimum Grade of C or ACC 372 Minimum Grade of C.

ACC 498 Accounting Internship II 3 cr
The Internship experience is designed to give students practical experience in their field of study. Students complete directed learning experiences under the supervision of the Department Chair. Prerequisites: Junior or Senior standing, declared major in accounting, overall GPA of at least 2.5 and internship agreement signed by the Department Chair.
Pre-requisite: ACC 496 Minimum Grade of P.

ACC 511 Financial Accounting Theory 3 cr
The evolution of general accounting theory leading up to and including the Conceptual Framework will be discussed as well as the specific theory underlying certain accounting topics of current interest.

ACC 521 Advanced Managerial Accounting 3 cr
Advanced managerial and cost accounting topics. Tools for decision making, cost allocation, inventory management systems, capital budgeting, performance measurement, transfer pricing and multi-national considerations.

ACC 531 Tax Planning and Research 3 cr
An examination of tax research tools, their utilization, and various tax planning considerations. Students are required to conduct research and tax planning upon assigned topics, and write a report on their findings.

ACC 532 Tax Partnerships/Corporations 3 cr
An examination of the federal tax treatment of partnerships and corporations. Topics include: tax aspects of the formation of the entity, elements of gross income, treatment of property dispositions, allowable deductions and credits, determination of entity and investor basis, and liquidation of the entity.

ACC 534 Tax of Gifts, Trusts & Estates 3 cr
An examination of the federal tax treatment of gratuitous transfers made during life and at death.

ACC 535 Multi Tax 3 cr
This course addresses the increased importance of international and multi-jurisdictional taxation in today's global environment. It introduces students to the principles guiding nexus, geographic allocation of income and the avoidance of double taxation. The course helps students develop an understanding of the U.S. tax rules that may apply to income involving the U.S. and other countries. It also helps students understand multistate tax rules. Students will develop an understanding of the tax implications resulting from business that is conducting electronically. Students will apply multi-jurisdictional tax principles and rules to solve case studies.

ACC 541 Advanced Accounting Systems 3 cr
Analysis of accounting information system case studies in order to expose students to real-world system problems and applications. Course work includes hands-on work with a variety of computer-based accounting application packages.

ACC 551 Advanced Auditing 3 cr
Advanced study of the application of Auditing Standards; internal control evaluations; applications of statistics; audits of EDP systems; internal and operational auditing, ethical, legal and reporting obligations.

ACC 556 Acc of Government and NFPE 3 cr
A study of the concepts and procedures underlying fund accounting, budgetary control, and financial reporting requirements for governmental and not-for-profit entities.
ACC 571  Professional Accounting  3 cr
A capstone course study of contemporary issues and responsibilities relevant to the accounting profession, including ethical, legal and international considerations.

ACC 572  Fraud Ex  3 cr
Overview of the nature of occupational fraud and how it is committed including an introduction to the actions that can be taken to determine the presence of occupational fraud and procedures that can be implemented to deter fraud. Students will also learn how financial statement fraud and reporting occur, including investigation and financial fraud prevention techniques.

ACC 590  Special Topics  3 cr
Designed to provide graduate students an opportunity to study selected topics. Prerequisites: Permission of Department Chair. A student may count no more than three hours of Special Topics in the MBA degree program.

ACC 594  Independent Study in Account  3 cr
Readings and research on selected topics. Conference and formal research report required. Permission of department chair.

Adult Health Nursing (AHN)

AHN 447  Adult Gerontological Nursing  5 cr
Synthesize theories, concepts, research, issues and trends in caring for adult gerontological population with complex multisystem health care needs. Emphasis is on the role of the professional nurse in health promotion and maintenance, illness care, and rehabilitation of adult gerontological population in a variety of acute and community settings.
Co-requisite: AHN 448
Pre-requisite: CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C and MCN 347 Minimum Grade of C and MCN 348 Minimum Grade of C.

AHN 448  Adult Gerontological Nsg Clin  4 cr
The focus of this course is the application of theories, concepts, evidence, issues and trends in caring for adult gerontological population experiencing complex multisystem health care needs. Emphasis is on the role of the professional nurse and on the use of the nursing process with adult gerontological population experiencing complex multisystem health care needs and their families.
Co-requisite: AHN 447
Pre-requisite: CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C and MCN 347 Minimum Grade of C and MCN 348 Minimum Grade of C.

AHN 513  AG/CNS Clinical Progression  1 TO 9 cr
The purpose of this progression practicum course is to facilitate student independence in the Adult-Gerontological Clinical Nurse Specialist role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Adult-Gerontological Clinical Nurse Specialist role. The emphasis is on the three spheres of influence and the continuum of healthcare services from wellness through acute care.

AHN 515  Ad/Geron CNS Nsg Intensive  1 cr
The purpose of this course is to provide opportunity for the Adult-Gerontological CNS student to gain experience in a adult-gerontological Clinical Nurse Specialist setting prior to entering adult-gerontological CNS specialty specific courses.

AHN 516  CNS Adult Geron Pract I  3 cr
The purpose of this precepted practicum course is to provide students an immersion experience in the CNS role with adult and geriatric populations in the promotion of health and wellness across the lifespan from early adult to the frail elderly. The focus of the course is to develop the CNS's ability to assimilate and apply evidence based information in the design, implementation and evaluation of nursing care activities, nursing practice standards and norms, and influencing organizations to support the delivery of nursing care and achievement of optimal health outcomes for a specified population. The emphasis of course is on the patient and nurses and nursing practice spheres. The student should participate in activities that include direct interactions with patients and families to promote health and well-being, consultation and with disciplines, coaching of patient, families and nurses, development of evidenced based policies, guidelines, or protocols; guiding the education of other nursing personnel to improve patient outcomes; and implementing practices that improve quality and promote cost-effective outcomes.
Co-requisite: NU 515
AHN 517  CNS Adult Geron Pract II  3 cr
The purpose of this precepted practicum course is to provide students an immersion experience in the CNS role in early adult to the frail elderly populations with acute health problems in a selected area of nursing practice. The focus of the course is to develop the CNS’s ability to assimilate and apply evidence based information in the design, implementation and evaluation of nursing care activities, nursing practice standards and norms, and influencing organizations to support the delivery of nursing care and achievement of optimal health outcomes for a specified population. The emphasis of the course is on the patient, nurses, and nursing practice spheres. The student should participate in activities that include direct interactions with patients and families to promote health and well-being, consultation and with disciplines, coaching of patient, families and nurses, development of evidenced based policies, guidelines, or protocols; guiding the education of other nursing personnel to improve patient outcomes; and implementing practices that improve quality and promote cost-effective outcomes.
Co-requisite: NU 516

AHN 518  CNS Adult Geron Pract III  3 cr
The purpose of this precepted capstone course is to provide students an immersion experience in the CNS role with adult and geriatric populations experiencing chronic health problems and exacerbations of chronic health problems in a selected area of nursing practice. The focus of the course is to develop the CNS’s ability to assimilate and apply evidence based information in the design, implementation and evaluation of nursing care activities, nursing practice standards and norms, and influencing organizations to support the delivery of nursing care and achievement of optimal health outcomes for a specified population. The emphasis of course is on patients, nurses, and nursing practice spheres. The student should participate in activities that include direct interactions with patients and families to promote health and well-being, consultation and with disciplines, coaching of patient, families and nurses, development of evidenced based policies, guidelines, or protocols; guiding the education of other nursing personnel to improve patient outcomes; and implementing practices that improve quality and promote cost-effective outcomes.
Co-requisite: NU 517

AHN 519  Diag Reason & Adv Pat Mgt CNS  4 cr
The purpose of this elective course is for the CNS to integrate advanced pharmacology, pathophysiology, and assessment for the diagnosis and management of acute and chronic problems of the adolescent/adult/old adult patients across the continuum of health services. The course focuses on the formulation of differential diagnoses and the development of pharmacologic and non-pharmacologic plans of care for the individual patients rather than aggregates. The emphasis is placed on synthesis and application of evidence-based practice to the development of differential diagnoses as a basis for health promotion and management.
Co-requisite: NU 516

AHN 530  Found Palliative Care/Adv Role  2 cr
This didactic course prepares the Adult-Gerontological with Palliative Care Specialty student a forum for the evaluation of issues and trends encountered by the DNP in palliative care. Students learn to coordinate and develop primary and palliative health care programs for individuals and populations across the adult lifespan. Emphasis is on critical analysis and management of issues by the DNP in an interdisciplinary health care delivery system.

AHN 531  Adv Palliative Cr/End of Life  2 cr
This course provides students an in-depth study of the health care management for patients seeking palliative and end of life care. Emphasis is on the interaction among health care providers and psychological/spiritual care of the patient and family.
Pre-requisite: AHN 530 Minimum Grade of C.

AHN 532  Adv Chronic Illness Care  2 cr
This course provides a study of the illness trajectories of chronic diseases that are among the leading causes of death in our society. Assessment and management of the illnesses as well as associated pain and symptoms will be examined. The focus is assisting patients, families, and other health professionals anticipate/prevent/reduce adverse symptoms from life threatening illnesses to maximize quality of life.
Pre-requisite: AHN 531 Minimum Grade of C.

AHN 533  Adv Palliative Care Practicum  1 TO 9 cr
This course provides preceptor and faculty a facilitated experience in which students have the opportunity to become proficient at providing comprehensive care to patients with life threatening, progressive illness by engaging in holistic assessment of pain and quality of life in a variety of settings. Advanced knowledge of palliative/end of life care will be integrated into assessing and managing the complex psychological, ethical, social, spiritual issues, and grief reactions while working as a member of a palliative care team.
Pre-requisite: AHN 532 Minimum Grade of C.
AHN 538 HPDP Dual Role (FNP/AGACNP) 2 cr
This didactic course prepares the Dual Role (Family NP/Adult-Gerontological Acute Care NP) student to identify and implement appropriate and culturally sensitive health promotion, health protection, and disease prevention strategies across the lifespan for clients in emergency, urgent, and ambulatory care settings. Emphasis is on health promotion, health protection, and disease prevention with strategic planning at the primary, secondary, and tertiary levels. Effective strategies for life-style behavioral changes will also be evaluated.

AHN 547 Dual Role AdAcut Nsg Intensive 1 cr
The purpose of this course is to provide opportunity for the Dual Role Acute Care Nurse Practitioner student to gain experience in a adult-gerontological acute setting prior to entering adult-gerontological acute specialty specific courses.

AHN 548 Family Prim Care NP I 4 cr
The purpose of this didactic course is to prepare (Family NP/Adult-Gerontological Acute Care NP) students to assess, diagnose, and manage selected health care needs of women and childbirth, infants, children, and families in a caring, competent manner. Emphasis is placed on (1) synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management; (2) wellness and the pathophysiology and epidemiology underlying acute and chronic health problems; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus is on the advanced practice nursing of individuals and families in primary healthcare settings. Co-requisite: AHN 549 Pre-requisite NU 518 Minimum Grade of C and NU 545 Minimum Grade of C Co-requisite: AHN 549 Pre-requisite NU 518 Minimum Grade of C and NU 545 Minimum Grade of C. NU 518 and NU 545 can be taken concurrently with this course.

AHN 549 Family Prim Care NP Prac I 4 cr
The purpose of this practicum course is to provide opportunities for Dual Role (Family NP/Adult-Gerontological Acute Care NP) students to apply concepts from AHN 548 in selected clinical settings. The emphasis is on culturally competent delivery of health care, diagnostic reasoning, and decision making/critical thinking through communication and collaboration. The focus is continued refinement of cognitive and clinical skills needed to provide comprehensive health assessments, diagnoses, and management of selected health care needs of women and childbirth, infants, children, and families in primary healthcare settings. Co-requisite: AHN 548 Co-requisite: AHN 548

AHN 550 Family Prim Care NP II 4 cr
This didactic course prepares the Dual Role (Family NP/Adult-Gerontological Dual Role) students to identify and implement appropriate and culturally sensitive health promotion and disease prevention strategies across the lifespan for clients in emergency, urgent, and ambulatory care settings. Emphasis is placed on health promotion and disease prevention with strategic planning at the primary, secondary, and tertiary levels. Prevention, early diagnosis, prompt treatment, and in-depth patient education will be emphasized. Effective strategies for life-style behavioral changes will also be evaluated. Co-requisite: AHN 551 Pre-requisite: NU 578 Minimum Grade of C and AHN 548 Minimum Grade of C Co-requisite: AHN 551 Pre-requisite: NU 578 Minimum Grade of C and AHN 548 Minimum Grade of C. NU 578 can be taken concurrently with this course.

AHN 551 Family Prim Care NP Pract II 5 cr
The purpose of this course is to provide a preceptor and faculty facilitated experience for Dual Role (Family NP/Adult-Gerontological Acute Care NP) students to practice within an advanced nursing framework. The focus is on the role of the Family Nurse Practitioner in the health care management of children, adults, and families in primary health care settings with the application and synthesis of knowledge and skills acquired from AHN 550 and previous courses. Emphasis is on leadership, professionalism, and collaboration with other health care providers in a culturally diverse environment. Co-requisite: AHN 550 Co-requisite: AHN 550

AHN 552 Adult-Geron Acute Care NP I 4 cr
The purpose of this course is to prepare Dual Role (Family NP/Adult-Gerontological Acute Care NP) students to assess, diagnose, and manage selected health care needs of young and older adults across the wellness-illness continuum in a caring, competent manner. Emphasis is placed on (1) synthesis of theoretical, scientific, and contemporary clinical knowledge used to develop differential diagnoses as a basis for health promotion, disease prevention, and management; (2) wellness and the pathophysiology and epidemiology underlying complex acute, critical, and chronic illness, disability, and/or injury; and (3) collaboration using appropriate processes for patient-centered, quality care in a culturally diverse system. The focus is on advanced practice nursing with the entire adult-older adult age spectrum and families in emergency, urgent, and ambulatory settings. Co-requisite: AHN 553 Pre-requisite: AHN 538 Minimum Grade of C and AHN 549 Minimum Grade of C and AHN 551 Minimum Grade of C and NU 607 Minimum Grade of C and NU 608 Minimum Grade of C Co-requisite: AHN 553 Pre-requisite: AHN 538 Minimum Grade of C and AHN 549 Minimum Grade of C and AHN 551 Minimum Grade of C and NU 607 Minimum Grade of C and NU 608 Minimum Grade of C. NU 607 and NU 608 can be taken concurrently with this course.
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<td>AHN 553</td>
<td>Adult-Ger Acute Care NP Prac I</td>
<td>4 cr</td>
<td>The purpose of this practicum course is to provide opportunities for Dual Role (Family NP/Adult-Gerontological Acute Care NP) students to apply concepts from AHN 552 in selected clinical settings. Emphasis is on critical thinking, diagnostic reasoning, differential diagnosis, communication, and collaboration in a culturally diverse system. The focus is refinement of cognitive and clinical skills needed to provide competent patient-centered care to young adults, adults, and older adults across the wellness-illness continuum with acute, critical and chronic illness, disability, and/or injury in emergency, urgent, and ambulatory care settings. Co-requisite: AHN 552 Co-requisite: AHN 552</td>
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<tr>
<td>AHN 554</td>
<td>Adult-Geron Acute Care NP II</td>
<td>4 cr</td>
<td>The purpose of this didactic course is to (1) provide the Dual Role (Family NP/Adult-Gerontological Acute Care NP) students with an in-depth study of the health care management of young adults, adults, and older adults across the wellness-illness continuum and to (2) provide a forum for the critical analysis and evaluation of issues and trends encountered by the Adult-Gerontology Acute Care Nurse Practitioner in an interdisciplinary health care delivery system. Emphasis is on leadership and professionalism in a culturally diverse system. The focus is on ensuring quality, patient-centered care of the adult-older adult population with selected complex acute, critical and chronic illness, disability, and/or injury to improve health outcomes in emergency, urgent, and ambulatory settings. Co-requisite: AHN 555 Pre-requisite: AHN 552 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C Co-requisite: AHN 555 Pre-requisite: AHN 552 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 610 and NU 613 can be taken concurrently with this course.</td>
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<td>AHN 555</td>
<td>Adult-Ger Acute Care NP Prac II</td>
<td>5 cr</td>
<td>The purpose of this practicum course is to provide a preceptor and faculty facilitated experience for Dual Role (Family NP/Adult-Gerontological Acute Care NP) students to practice within an advanced nursing framework by synthesizing and applying the knowledge and skills required in AHN 554 and previous courses. Emphasis is on leadership, professionalism, and collaboration in a culturally diverse system. The focus is on implementing the role of the Adult-Gerontology Acute Care Nurse Practitioner in the health care management of young adults, adults, and older adults across the wellness-illness continuum with acute, critical and chronic illness, disability, and/or injury in emergency, urgent, and ambulatory health care settings. Co-requisite: AHN 554 Co-requisite: AHN 554</td>
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<td>AHN 558</td>
<td>Dual Role FNP Clin Progression</td>
<td>1 cr</td>
<td>The purpose of this progression practicum course is to facilitate student independence in the Dual Role Family Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Family Nurse Practitioner role of the Dual Role (FNP/AGACNP) program.</td>
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<td>AHN 559</td>
<td>Dual Role-AGAC Cli Progression</td>
<td>1 cr</td>
<td>The purpose of this progression practicum is to facilitate student independence in the Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Dual Track AGACNP Nurse Practitioner role.</td>
</tr>
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<td>AHN 566</td>
<td>AG/ACNP Clinical Progression</td>
<td>1 TO 4 cr</td>
<td>The purpose of this progression practicum is to facilitate student independence in the Adult-Geron Acute Care Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and develop the necessary skills to progress to the next level of competency in the Adult-Geron Acute Care Nurse Practitioner role.</td>
</tr>
<tr>
<td>AHN 567</td>
<td>Ad/Geron Acute Nsg Intensive</td>
<td>1 cr</td>
<td>The purpose of this course is to provide opportunity for the Adult-Gerontological Acute Care Nurse Practitioner student to gain experience in a adult-gerontological acute setting prior to entering adult-gerontological acute specialty specific courses.</td>
</tr>
<tr>
<td>AHN 568</td>
<td>Intro to Adult-Geron Acute NP</td>
<td>3 cr</td>
<td>The purpose of this first didactic course is to prepare the Adult Geronto Acute Care Nurse Practitioner students to assess, diagnose, and manage selected health care needs of adults and children. Emphasis is placed on synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management. Co-requisite: AHN 571 Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.</td>
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AHN 571 HPDP Adult-Geron Acute Care NP 2 cr
The purpose of this didactic course is to prepare the Adult Geron Acute Care Nurse Practitioner student to identify and implement appropriate health promotion and disease prevention strategies across the lifespan. The focus is on the advanced practice nursing of individuals and families in primary care settings. Emphasis is placed on health promotion/disease prevention with strategic planning at the primary, secondary and tertiary levels of prevention. Various issues are explored pertinent to the advanced practice role. Co-requisite: AHN 568

AHN 572 Adult-Geron Acute NP I 3 cr
The purpose of this didactic course is to prepare Adult Geron Acute Care Nurse Practitioner students to assess, diagnose, and manage selected health care needs of adults. The focus is on advanced practice nursing with adults and families in primary and acute care settings. Emphasis is placed on the wellness and the pathophysiology and epidemiology underlying acute and chronic health problems. Co-requisite: AHN 573
Pre-requisite: AHN 568 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.

AHN 573 Adult-Gerone Acute NP Prac I 3 cr
The purpose of this practicum course is to provide opportunities for students to apply concepts in select clinical settings. Focus is on adults and families in primary and acute care settings. The emphasis is on diagnostic reasoning and decision making/critical thinking. Co-requisite: AHN 572

AHN 574 Adult-Geron Acute NP II 3 cr
The purpose of this course is provide an in-depth study of the health care management of the Adult Geron Acute Care patient. Emphasis is on the interaction among health care providers in a culturally diverse environment. Co-requisite: AHN 575
Pre-requisite: AHN 572 Minimum Grade of C.

AHN 575 Adult-Geron Acute NP Prac II 3 cr
The purpose of this course is to provide an opportunity for the Adult Acute Care Nurse Practitioner student to practice within an advanced nursing framework. The focus is on the role of the advanced practice nurse in the health care management of adults. Emphasis is on collaboration with other health care providers in a culturally diverse environment. Co-requisite: AHN 574

AHN 576 Adult Geron Acute NP Prac III 4 cr
The purpose of this culminating course is to provide a preceptor and faculty facilitated experience in the Adult Geron Acute Care Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses. Co-requisite: AHN 577
Pre-requisite: NU 607 Minimum Grade of C. NU 607 can be taken concurrently with this course.

AHN 577 Adult Geron Acute NP III 3 cr
The purpose of this course is to provide a forum for the evaluation of issues and trends encountered in advanced adult gerontological acute care nursing. Emphasis is on a critical analysis and management of issues by the Adult Geron Acute Care Nurse Practitioner in an interdisciplinary health care delivery system. Co-requisite: AHN 576
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

AHN 580 Intro to Adult-Geron Prim NP 2 cr
The purpose of this course is to expand the Adult-Geron Primary Care Nurse Practitioner student's knowledge and skills for obtaining, recording, and analyzing a systemic health assessment of the adult and older adult. Emphasis is placed on synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management. Co-requisite: AHN 581
Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.

AHN 581 HP/DP Adlt-Geron Prim Care NP 2 cr
The purpose of this didactic course is to prepare the Adult-Gerontological Primary Care Nurse Practitioner nursing student with a knowledge base for identifying and implementing appropriate health promotion and disease prevention strategies with older adults. The focus is on advanced practice nursing of adults and older adults in multiple health care settings. Emphasis is placed on health promotion/disease prevention and related health issues with strategic planning at the primary, secondary, and tertiary levels of prevention. Various issues are explored which are pertinent to the advanced practice role. Co-requisite: AHN 588

AHN 588 HP/DP Adult-Geron Prim Care NP 2 cr
The purpose of this didactic course is to prepare the Adult-Gerontological Primary Care Nurse Practitioner student to assess, diagnose, and manage selected health care needs of culturally diverse adult and well and frail geriatric populations. The focus is on the advanced practice nursing of adults and their families in a variety of health care settings. Emphasis is placed on wellness, the pathophysiology and epidemiology underlying acute and chronic health problems with a focus on the unique health care needs of elders. Co-requisite: AHN 592
Pre-requisite: AHN 588 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.
AHN 592  Adlt-Geron Primary NP Pract I  3 cr
The purpose of this practicum course is to provide opportunities for Adult-Geron Primary Care Nurse Practitioner students to apply concepts from AHN 591 in primary and acute care settings with adults and families experiencing health concerns. This clinical course will offer clinical hours for targeting adult health and gerontological health issues. Students will divide clinical hours between young adults, middle aged adults, and elders.
Co-requisite: AHN 591

AHN 593  Adult-Gero Prim NP II  3 cr
The purpose of this course is to provide the Advanced Adult-Geron Primary Care Nurse Practitioner student an in-depth study of health care management of adults, well and frail elders, and their families within the framework of advanced nursing. The focus is on selected acute and chronic complex health care problems. Emphasis is on the interaction among health care providers in a culturally diverse environment. This clinical course will offer experience with diverse populations including young and middle aged adults and elders in a variety of settings.
Co-requisite: AHN 593

AHN 594  Adult-Geron Prim NP Prac II  3 cr
The purpose of this course is to provide opportunity for the Adv Adult-Geron Primary Care Nurse Practitioner student to practice within an advanced nursing framework. The focus is on the role of the advanced practice nurse in the health care management of adult and geriatric patients with physical and psychiatric-mental health concerns. Emphasis is on collaboration with other health care providers in a culturally diverse environment. This clinical course will offer experience with diverse populations including young and middle aged adults and elders in a variety of settings.
Co-requisite: AHN 593

AHN 595  Adult-Gero Primary Care NP III  2 cr
The purpose of this course is to provide a forum for the evaluation of issues and trends encountered in adult and gerontological nursing care. Emphasis is on critical analysis and management of issues by the Advanced Adult-Geron Primary Care Nurse Practitioner in an interdisciplin ary health care delivery system.
Co-requisite: AHN 596
Pre-requisite: AHN 593 Minimum Grade of C and NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

AHN 596  Adult Geron Prim NP Prac III  4 cr
The purpose of this culminating course is to provide a preceptor- and faculty facilitated experience in the Advanced Adult-Geron Primary Care Nurse Practitioner role. The focus is the application and synthesis of knowledge and skills acquired in all previous courses. Students will have clinical experiences with all ages of adults and elders in a variety of settings.
Co-requisite: AHN 595
Pre-requisite: NU 607 Minimum Grade of C. NU 607 can be taken concurrently with this course.

AHN 597  Ad/Geron Primary Nsg Intensive  1 cr
The purpose of this course is to provide opportunity for the Adult-Gerontological Primary Care Nurse Practitioner student to gain experience in a adult-gerontological primary setting prior to entering adult-gerontological primary specialty courses.

AHN 598  AG/PCNP Clinical Progression 1 TO 4 cr
The purpose of this progression practicum is to facilitate student independence in the Adult-Geron Primary Care Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Adult-Geron Primary Care Nurse Practitioner role.

AHN 604  Adult-Geron Acute Care NP PP&D  3 cr
This course assists the Adult-Gerontological Acute Care Nurse Practitioner DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the Adult-Gerontological Acute Care Nurse Practitioner students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

AHN 617  AG ACNP Residency I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The Adult-Gerontological Acute Care Nurse Practitioner student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the Adult-Gerontological Acute Care Nurse Practitioner student will work with the primary faculty advisor to complete projects and advance their selected practice area. The Adult-Gerontological Acute Care Nurse Practitioner student will have access to and authority for expanded scope of practice to master the DNP competences. Residency sites will depend upon the Adult-Gerontological Acute Care Nurse Practitioner student's career trajectory and approval by collaborating faculty. During the residency semester, students must participate in scheduled scholarly seminars online. Direct practice/management is required.
Pre-requisite: AHN 604 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.
**AHN 618 AG ACNP Residency II**  
Provides Adult-Gerontological Acute Care Nurse Practitioner students the opportunity to fully express all DNP competencies. The Adult-Gerontological Acute Care Nurse Practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project. 
Pre-requisite: AHN 617 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

**AHN 619 AG ACNP Residency III**  
Final course in residency series as Adult-Gerontological Acute Care Nurse Practitioner student continues to implement and evaluate project plan. Provides Adult-Geron Acute Care Nurse Practitioner student the opportunity to fully express all DNP competencies. The Adult-Gerontological Acute Care Nurse Practitioner student, guided by the core faculty and advisor, completes quality improvement evidence-based system's change project. 
Pre-requisite: AHN 618 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

**AHN 630 Dysrhythmias and the Heart**  
The first of four cardiovascular specialization courses focuses on the development of a methodical approach to dysrhythmia interpretation. Emphasis is on diagnosis and management of the patient with cardiac dysrhythmias via an evidence-based approach.

**AHN 631 Foundations of Cardiac Care**  
This second of four cardiovascular specialization courses focuses on health promotion, prevention, health disparities and cultural competence for patients with common cardiovascular disorders. Emphasis is on cardiovascular nurse practitioner's role in managing patients as an integral part of the interdisciplinary health care team. 
Pre-requisite: AHN 630 Minimum Grade of C. AHN 630 can be taken concurrently with this course.

**AHN 632 Diag & Mgmnt of Acute CVD**  
The third of four cardiovascular specialization courses focuses on advanced healthcare management of patients with acute cardiovascular disorders. Emphasis is on diagnosis and management, to include assessment, diagnostic procedures, treatment and pharmacological management. Particular attention will be given to cardiovascular health disparities in a culturally diverse environment. 
Pre-requisite: AHN 631 Minimum Grade of C.

**AHN 633 Dig/Mgmt Complex CV Disorders**  
The third of four cardiovascular specialization courses focuses on advanced healthcare management of patients with complex cardiovascular disorders. Emphasis is on diagnosis and management, to include assessment, diagnostic procedures, treatment and pharmacological management. Particular attention will be given to cardiovascular health disparities in a culturally diverse environment. 
Pre-requisite: AHN 632 Minimum Grade of C.

**AHN 634 Adult-Geron CNS PP&D**  
This course assists the Adult-Gerontological Clinical Nurse Specialist DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning development as a preliminary step to the Adult-Gerontological Clinical Nurse Specialist students’ selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. 
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

**AHN 635 Adult-Geron CNS Residency I**  
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The Adult-Gerontological Clinical Nurse Specialist student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the Adult-Gerontological Clinical Nurse Specialist student will work with the primary faculty advisor to complete projects and advance their selected practice area. The Adult-Gerontological Clinical Nurse Specialist student will have access to and authority for expanded scope of practice to master the DNP competences. Residency sites will depend upon the Adult-Gerontological Clinical Nurse Specialist student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. A total of 180 clinical hours of direct practice/management is required. 
Pre-requisite: AHN 634 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

**AHN 636 Adult-Geron CNS Residency II**  
Provides Adult-Gerontological Clinical Nurse Specialist students the opportunity to fully express all DNP competencies. The Adult-Gerontological Clinical Nurse Specialist student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project. 
Pre-requisite: AHN 635 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

**AHN 637 Adult-Geron CNS Residency III**  
This course assists the Adult-Gerontological Clinical Nurse Specialist DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning development as a preliminary step to the Adult-Gerontological Clinical Nurse Specialist students’ selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. 
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.
AHN 637  Adult-Geron CNS Residency III  3 cr
Final course in residency series as Adult-Gerontological Clinical Nurse Specialist student continues to implement and evaluate project plan. Provides Adult-Gerontological Clinical Nurse Specialist student the opportunity to fully express all DNP competencies. The Adult-Gerontological Clinical Nurse Specialist student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: AHN 636 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

AHN 670  AG-ACNP(DR) PP&D  3 cr
This course assists the DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

AHN 671  AG/ACNP(DR) Residency I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. In this course, students will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the student will work with the primary faculty advisor to develop a project to advance system's change in their selected practice area. The student will have access to and authority for expanded scope of practice to master all DNP competencies. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. A total of 180 clinical hours of direct practice/management is required.
Pre-requisite: (NU 608 Minimum Grade of C and AHN 670 Minimum Grade of S).

AHN 672  AG-ACNP (DR) Residency II  3 cr
In this mentored and supervised experience, students will work with the primary faculty advisor to implement a scholarly project to advance system's change in their selected practice area. The student will have access to and authority for expanded scope of practice to master all DNP competencies. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, students must participate in scheduled scholarly seminars online. A total of 180 clinical hours of direct practice/management is required.
Pre-requisite: AHN 671 Minimum Grade of C.

AHN 673  AG-ACNP(DR) Residency III  3 cr
Final course in residency series as student continues to implement and evaluate project plan. Provides the student the opportunity to fully express all DNP competencies. The student, guided by the core faculty advisor, completes a quality improvement, evidence-based system's change project.
Pre-requisite: (AHN 671 Minimum Grade of C and AHN 672 Minimum Grade of C).

AHN 680  Family NP (DR) PP&D  3 cr
This course assists the DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, and a plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

AHN 681  Family NP (DR) Residency I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. In this course, students will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the student will work with the primary faculty advisor to develop a project to advance system's change in their selected practice area. The student will have access to and authority for expanded scope of practice to master all DNP competencies. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. A total of 180 clinical hours of direct practice/management is required.
Pre-requisite: (AHN 680 Minimum Grade of S and NU 608 Minimum Grade of C).

AHN 682  FNP (DR) Residency II  3 cr
In this mentored and supervised experience, students will work with the primary faculty advisor to implement a scholarly project to advance system's change in their selected practice area. The student will have access to and authority for expanded scope of practice to master all DNP competencies. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, students must participate in scheduled scholarly seminars online. A total of 180 clinical hours of direct practice/management is required.
Pre-requisite: AHN 681 Minimum Grade of C.
AHN 683  FNP (DR) Residency II  3 cr
Final course in residency series as student continues to implement and evaluate project plan. Provides the student the opportunity to fully express all DNP competencies. The student, guided by the core faculty and advisor, completes a quality improvement, evidence-based system's change project.
Pre-requisite: AHN 682 Minimum Grade of C.

AHN 692  AHN DNP Project Progression  3 cr
Students will register for this course to complete residency course work under supervision of faculty. Students must remain continuously enrolled until all residency requirements are completed.
Pre-requisite: AHN 618 Minimum Grade of C or AHN 695 Minimum Grade of C or NU 618 Minimum Grade of C or AHN 638 Minimum Grade of C or AHN 663 Minimum Grade of C or AHN 658 Minimum Grade of C.

AHN 693  Adult-Geron Primary NP PP&D  3 cr
This course assists the Adult-Geron Primary Care Nurse Practitioner student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the Adult-Geron Primary Care Nurse Practitioner students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: AHN 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C. NU 611 can be taken concurrently with this course.

AHN 694  Adult-Gero Primary Cr NP Res I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The Adult-Geron Primary Care Nurse Practitioner student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the Adult-Geron Primary Care Nurse Practitioner student will work with the primary faculty advisor to complete projects and advance their selected practice area. The Adult-Geron Primary Care Nurse Practitioner student will have access to and authority for expanded scope of practice to master the DNP competencies. Residency sites will depend upon the Adult-Geron Primary Care Nurse Practitioner student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required.
Pre-requisite: AHN 693 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

AHN 695  Adlt-Gero Primary Cr NP Res II  3 cr
Provides Adult-Geron Primary Care Nurse Practitioner students the opportunity to fully express all DNP competencies. The Adult-Geron Primary Care Nurse Practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: AHN 694 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

AHN 696  Adlt-Gero Prim Care NP Res III  3 cr
Final course in residency series as Adult-Geron Primary Care Nurse Practitioner student continues to implement and evaluate project plan. Provides Adult-Geron Primary Care Nurse Practitioner student the opportunity to fully express all DNP competencies. The Adult-Geron Primary Care Nurse Practitioner student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: AHN 695 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

African-American Studies (AFR)

AFR 101  Intro to African Amer Studies  3 cr
An interdisciplinary investigation of the origins, experiences, conditions, accomplishments and contributions of people of African ancestry in the United States.

Air Force Studies (AS)

AS 101L  Foundation of USAF I Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 101

AS 102L  Heritage and Values II Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 102

AS 201L  Team/Leadership Fund I lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 201

AS 202L  Team/Leadership Fund II Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 202
AS 301L  Lead People/Effect Comm I Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 301

AS 302L  Lead People/Eff Comm II Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 302

AS 401L  Sec/Lead/Comm Prep I Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 401

AS 402L  Sec/Lead/Comm Prep II Lab  0 cr
Provides an introduction to the military profession, including applications in leadership, drill and ceremony, customs and courtesies and community service.
Co-requisite: AS 402

AS 101  Foundations of USAF I  1 cr
AS 101 is a survey course designed to introduce students to the United States Air Force and encourage participation in Air Force Reserve Officer Training Corps. Featured topics include: overview of ROTC, special programs offered through ROTC, mission and organization of the Air Force, brief history of the Air Force, introduction to leadership and leadership related issues, Air Force Core Values, Air Force officer opportunities, and an introduction to communication studies. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences.
Co-requisite: AS 101L

AS 102  Heritage and Values II  1 cr
AS 102 is a survey course designed to introduce students to the United States Air Force and encourage participation in Air Force Reserve Officer Training Corps. Featured topics include: overview of ROTC, special programs offered through ROTC, mission and organization of the Air Force, brief history of the Air Force, introduction to leadership and leadership related issues, Air Force Core Values, Air Force officer opportunities, and an introduction to communication studies. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences.
Co-requisite: AS 102L

AS 201  Team/Leadership Fund I  1 cr
AS 201 is designed to provide a fundamental understanding of both leadership and team building. Students will apply leadership perspectives when completing team building activities and discussing things like conflict management. Students should demonstrate basic verbal and written communication skills. Cadets will apply these lessons at Field Training, which follows AS 201 and AS 202. Co-requisite: AS 201L
Co-requisite: AS 201L

AS 202  Team/leadership Fund II  1 cr
AS 202 is designed to provide a fundamental understanding of both leadership and team building. Students will apply leadership perspectives when completing team building activities and discussing things like conflict management. Students should demonstrate basic verbal and written communication skills. Cadets will apply these lessons at Field Training, which follows AS 201 and AS 202L. Co-requisite: AS 202L
Co-requisite: AS 202L

AS 301  Lead People/Effect Comm I  3 cr
AS 301 is a study of leadership, management fundamentals, professional knowledge, Air Force personnel and evaluation systems, leadership ethics, and communication skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory Leadership Laboratory complements this course by providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply leadership and management principles of this course.
Co-requisite: AS 301L

AS 302  Leading People/Eff Comm II  3 cr
AS 302 is designed to build on the leadership fundamentals taught in AS 200. Cadets will have the opportunity to utilize their skills as they begin more of a leadership role in the detachment. The course continues into advanced skills and ethics training that will prepare them for becoming an officer and supervisor. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory Leadership Laboratory complements this course by providing advanced leadership experiences in officer type activities, giving student the opportunity to apply leadership and management principles of the course. Co-requisite: AS 301L
Co-requisite: AS 302L
AS 401  Sec/Lead/Comm Prep I  3 cr
AS 401 examines the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on the military as a profession, 'officership', military justice, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Within this structure, continued emphasis is given to refining communication skills.
Co-requisite: AS 401L

AS 402  Sec/Lead/Comm Prep II  3 cr
Course examines the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on the military as a profession, officership, military justice, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Within this structure, continued emphasis is given to refining communication skills.
Co-requisite: AS 402L

AS 444  Studies in Ceramics  3 cr
Independent work in an approved Ceramics topic under the direction of a studio faculty member. This course may be repeated for a maximum of 6 credit hours. Fee.

**Allied Health Professions (AHP)**

AHP 101  Freshman Sem in Allied Health  2 cr
A course for first-time students that assists with maximizing the student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by college life. Taught in small groups, the course provides an introduction to the nature of higher education with special emphasis on health-related disciplines. Appropriate reading and writing assignments will be required.

AHP 390  Special Topics  1 TO 9 cr
The purpose of this course for the undergraduate student is to develop an improved understanding of culture, to recognize any cultural practices that affect health care, and to incorporate this understanding into the provision of care. Culture will be examined through writing, cultural experiences, and through collaboration.

AHP 510  IPE Autism Spectrum Disorders  1 cr
This foundational course is designed to prepare graduate students in OT, PT, SLP, MD and ED to provide high-quality services to individuals with autism spectrum disorder and other developmental disabilities. The emphasis will be on interprofessional education using team-based instruction to support effective interprofessional practice in both educational and health care settings. ADDITIONAL RESTRICTION: Students can only be enrolled following successful application and admission. Contact the course instructor for information on application.

AHP 590  Special Topics  1 TO 9 cr
Selected topics in Health Sciences. Requires special permission.

**Anthropology (AN)**

AN 121L  Biological Anthropology Lab  1 cr
The lab section of this course is designed to provide a more in-depth understanding of biological anthropology through a variety of exercises and hands-on learning opportunities. Topics covered parallel those in lecture (AN 121) and include evolutionary theory, living primates, primate origins, human evolution, and modern human variation.
Co-requisite: AN 121

AN 100  Intro to Cultural Anthropology  3 cr
Introduces culture as a set of integrated behaviors and meanings learned in a social environment. Explores the diversity of human cultural practices in terms of kinship, gender, religion, subsistence, and politics. Language is emphasized as the means by which culture is transmitted from one generation to the next.

AN 101  Intro Archaeology-Bio Anthro  3 cr
The place of people in nature; the origin, development, and differentiation of people as biological organisms; archaeological evidence of early human cultures; basic concepts and principles for understanding human cultures. Introduces students to the topics of evolution, genetics, and primates and integrates cultural aspects associated with early human development. The fundamental orientation and methods of archaeology are introduced and an overview of world prehistory presented.

AN 121  Biological Anthropology  3 cr
This course covers the topics of human evolution and modern human variation, focusing on humanity's biological roots and modern appearance. To understand our present physical and social condition, we must understand our evolutionary past. This course discusses our place within the mammalian evolutionary lineage, evolutionary theory, population genetics, primate behavior, human evolution, and modern human variation.
Co-requisite: AN 121L
AN 190  Special Topics -  3 cr
Different topics of anthropological importance will be studied as announced. This course may be taken twice for credit when content varies, but not for more than six credits.

AN 200  Language and Culture  3 cr
Brief introduction to descriptive and structural linguistics, language universals, classification and processes of change in language, language and thought, social cultural factors as expressed in language, origin of language, child language and non-verbal communication.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 250  Forensic Anthropology  3 cr
This course will introduce students to the field of forensic anthropology. Specifically, it will survey the basic methods employed by forensic anthropologists to recover and analyze human skeletal remains, including the construction of a biological profile and the analysis of skeletal trauma.

AN 290  Special Topics -  1 TO 3 cr
Different topics of anthropological importance will be studied as announced. This course may be taken twice for credit when content varies, but not for more than 6 credits.
Prerequisites: AN 100 or AN 101 Minimum Grade of D.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 300  Thinking Anthropologically  1 cr
This one-credit hour course is designed to expose anthropology majors to important applied concepts in our field, with a particular emphasis on scientific literacy and professional development. Through short lectures, guided activities, facilitated discussions, and student presentations, this course will help our majors identify and engage in practical skills to enhance their success as students as well as in their chosen post-graduation career paths.
Pre-requisite: AN 100 Minimum Grade of C and AN 101 Minimum Grade of C.

AN 305  Arch Method and Theory  3 cr
The theoretical basis of archaeology, and the various methods used to discover and interpret the human past from material evidence.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 313  New World Archaeology  3 cr
The evolution of Native American cultures, from the first arrival of humans across the Bering Straits land bridge to the European settlement of the New World.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 335  Field Work in Archaeology  4 cr
Archaeological field and laboratory techniques include excavation, site survey, artifact processing and analysis.
Fee.
Pre-requisite: AN 101 Minimum Grade of D.

AN 340  Native American Cultures-W  3 cr
An ethnographic and ethnohistorical survey of native cultures of North America, including historical and modern groups, with an emphasis on Indians of the Southeast.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 342  Applied Anthropology  3 cr
Issues surrounding theory and method of applied anthropology. Presentation and analysis of case studies concerning problems in areas such as development, both domestic and in foreign settings, community health, homelessness, drug and alcohol abuse, and others.
Prerequisites: AN 100 or permission of instructor.
Pre-requisite: AN 100 Minimum Grade of D.

AN 347  Latin Amer Cultures-Societies  3 cr
A survey of Latin American society and culture from the pre-contract period to the present. Pre-Columbian antecedents, colonial use of land and labor, patterns of race, class and ethnicity, and problems of development are examined.
Prerequisite: AN 100 or permission of instructor.
Pre-requisite: AN 100 Minimum Grade of D.

AN 355  Gender and Anthropology  3 cr
This course provides an introduction to anthropological themes and debates in gender theory, including an ethnographic survey of women and men in a variety of cultures.
Prerequisites: AN 100 or permission of instructor.
Pre-requisite: AN 100 Minimum Grade of D.

AN 357  Political Anthropology  3 cr
Authority, power, and conflict are examined cross-culturally and in evolutionary perspective. Particular emphasis is placed on the origins of stratification and the state.
Pre-requisite: AN 100 Minimum Grade of D.

AN 358  Economic Anthropology  3 cr
An evolutionary survey of production and exchange in diverse societies. Considers the applicability of western economic theory to nonmarket economies, as well as their transformation by global capitalism.
Pre-requisite: AN 100 Minimum Grade of D.

AN 365  Human Osteology  3 cr
This hands-on course focuses on the identification of the bones of the human skeleton and its application to specialties within biological anthropology, including bioarchaeology and forensic anthropology. Topics to be covered include human skeletal and dental anatomy, skeletal growth and development, skeletal pathology and anomalies, and the biological profile.
Pre-requisite: AN 210 Minimum Grade of B or AN 250 Minimum Grade of B.
AN 370 Human Origins and Evolution 3 cr
This lecture, discussion, and lab-based seminar will examine the fossil, genetic, and archaeological evidence for human evolution - from the origins of primates to anatomically modern humans - with particular attention given to our hominin ancestors. Students will learn about the nature and timing of these developments, current theoretical models used to explain such changes, and the implications of these evolutionary trends for understanding modern human adaptations. Important fossil sites and associated material culture will also be used to provide insight into hominin biocultural behavior. Students must take AN 121/AN 210/L (formerly AN 210/L) as a prerequisite for this course, or receive permission of the instructor.
Pre-requisite: AN 201 Minimum Grade of C and AN 210L Minimum Grade of C or AN 121 Minimum Grade of C and AN 121L Minimum Grade of C.

AN 390 Special Topics 1 TO 3 cr
Different topics of anthropological importance will be studied as announced. This course may be taken twice for credit when content varies, but not for more than 6 credits.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 394 Directed Studies - 1 TO 3 cr
Supervised readings or projects. No more than a total of six hours may be taken for credit. Requires prior approval of instructor.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 435 Museum Methods in Archaeology 3 cr
Archaeology as practiced in museums, including the registration and curation of archaeological collections; artifact conservation; public interpretation of the past; and exhibit design, composition, construction, and evaluation. Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 440 Adv Archaeological Field Meth 4 cr
This course involves participant instruction in archaeological field and laboratory techniques, including advanced excavation and survey methods, soils analysis, site mapping with electronic instruments, sampling strategy, and site interpretation. Requires permission of instructor.

AN 442 Cultural Resource Management 3 cr
This course examines the interaction between archaeologists, architectural historians, historic preservationists, state and federal governments, and the public with regard to cultural resources. The focus of the course is identification, evaluation, and mitigation of cultural resources. Related topics discussed include public perceptions of the past, ethics, and being a professional in historical preservation.

AN 454 Anthropological Theory - W 3 cr
An advanced historical survey of anthropological ideas, with primary emphasis on contemporary theoretical orientations and debates. Examines anthropology's often contested status as a science or humanity.
Pre-requisite: AN 100 Minimum Grade of D.

AN 470 Bioarchaeology - W 3 cr
This class introduces students to the field of bioarchaeology, the study of human remains in archaeological contexts. Through lectures, readings, activities, and discussions, students will examine how skeletal remains are used to reconstruct life in the past, including patterns of subsistence, diet, disease, demography, biological relatedness, and physical activity.
Pre-requisite: AN 250 Minimum Grade of B or AN 365 Minimum Grade of B.

AN 490 Special Topics 3 cr
Different topics of anthropological importance will be studied as announced. This 3 hour course may be repeated for credit as long as the content varies up to a maximum of 6 credit hours. Requires junior or senior standing; or permission of instructor.
Pre-requisite: (AN 100 Minimum Grade of D or AN 101 Minimum Grade of D).

AN 492 Senior Seminar - 3 cr
Course specifically designed for majors in their senior year. Some topical aspect of the discipline will be analyzed.
Pre-requisite: AN 100 Minimum Grade of D or AN 101 Minimum Grade of D.

AN 496 Anthropology Internship 3 TO 6 cr
Provides an opportunity to combine academic principles with practical experiences in an agency dealing with human relationships, cultural resources, or primate research. Specifics of the assignment result from mutual agreement among student, course director and agency. Course may be repeated for a maximum of six hours of credit. Requires advanced standing in Anthropology major and permission of course instructor. Fee.

AN 498 Senior Thesis 3 cr
With the guidance and advice of a faculty mentor, student will identify and carry out an in-depth, year-long, field research project in anthropology. The Senior Thesis will be judged and graded by a committee of three faculty, chaired by the faculty mentor. This course will be repeated to continue the thesis during a second semester. This is a 3 hour course that is expected to be repeated once for a total of six hours. Must be an Anthropology major; senior status; permission of a faculty mentor through an AN 394 Directed Studies course taken during the junior year.
Pre-requisite: AN 394 Minimum Grade of D.
AN 499  Honors Senior Thesis - H  3 cr
With the guidance and advice of a faculty mentor, honors students will identify and carry out an in-depth, year-long field research project in anthropology. The Honors Senior Thesis will be judged and graded by a committee of three faculty, chaired by the faculty mentor. This is a 3 hour course that can be repeated once for a total of six hours. Must be an Anthropology major; senior status; permission of a faculty mentor; grade point average of 3.5; and completion of a thesis prospectus prepared in consultation with the faculty mentor through an AN 394 Directed Studies course taken during the junior year. Pre-requisite: AN 394 Minimum Grade of D.

AN 535  Museum Methods in Archaeology  3 cr
Archaeology as practiced in museums, including the registration and curation of archaeological collections; artifact conservation; public interpretation of the past; and exhibit design, composition, construction, and evaluation.

AN 542  Adv. Cultural Resource Mgmt.  3 cr
This course examines the interaction between archaeologists, architectural historians, historic preservationists, state and federal governments, and the public with regard to cultural resources. The focus of the course is identification, evaluation, and mitigation of cultural resources. Related topics discussed include public perceptions of the past, ethics, and being a professional in historical preservation.

AN 594  Directed Studies -  1 TO 3 cr
Field or library projects through which special interests of the student may be pursued on a tutorial basis with a graduate faculty member. Arrangements must be made prior to registration. Permission of the Department Chair is required.

Applied Music A (MUA)

MUA 100  Recital Class  0 cr
A convocation required each term of all full-time music majors meeting each week in laboratory session to hear performances, perform, and discuss performing techniques, plus ten evening public programs. Six semesters of successful participation required for graduation with adjustments for transfer students.

MUA 101  Piano - Elective  1 cr
Private study at the elective level

MUA 102  Piano - Elective  2 cr
Private study at the elective level.

MUA 111  Organ - Elective  1 cr
Private study at the elective level.

MUA 112  Organ - Elective  2 cr
Private study at the elective level.

MUA 124  Group Applied - Elective Voice  1 cr
Applied voice lessons taught in groups of 4, consisting of individual instruction in technique and performance. Two 1-hour sessions per week TBA (MW or TR). This course is for non-majors. Majors and minors in music should take other applied courses. Special fee applies. Prerequisite: Admission by audition. Registration through the Department of Music.

MUA 131  Violin - Elective  1 cr
Private study at the elective level.

MUA 132  Violin - Elective  2 cr
Private study at the elective level.

MUA 141  Viola - Elective  1 cr
Private study at the elective level.

MUA 142  Viola - Elective  2 cr
Private study at the elective level.

MUA 151  Violoncello - Elective  1 cr
Private study at the elective level.

MUA 152  Violoncello - Elective  2 cr
Private study at the elective level.

MUA 161  String Bass - Elective  1 cr
Private study at the elective level.

MUA 162  String Bass - Elective  2 cr
Private study at the elective level.

MUA 171  Harp - Elective  1 cr
Private study at the elective level.

MUA 172  Harp - Elective  2 cr
Private study at the elective level.

MUA 181  Guitar - Elective  1 cr
Private study at the elective level.

MUA 182  Guitar - Elective  2 cr
Private study at the elective level.

MUA 186  Percussion - Elective  1 cr
Private study at the elective level.

MUA 187  Percussion - Elective  2 cr
Private study at the elective level.

MUA 201  Piano Major-Lower Division  1 cr
Private study at the secondary level.

MUA 202  Piano Major-Lower Division  2 cr
Private study at the secondary level.

MUA 211  Organ Major-Lower Division  1 cr
Private study at the secondary level.

MUA 212  Organ Major-Lower Division  2 cr
Private study at the secondary level.
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<thead>
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<th>Course Title</th>
<th>Credits</th>
<th>Course Description</th>
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<td>MUA 251</td>
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<td>Performance concentration junior recital. To be taken with a 400 level applied music course.</td>
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<td>Organ Major-Upper Division</td>
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<td>Violin Major-Upper Division</td>
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<td>MUA 332</td>
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<td>MUA 342</td>
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<td>MUA 352</td>
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<td>MUA 361</td>
<td>String Bass Major-Upper Div</td>
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<td>MUA 371</td>
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<td>MUA 372</td>
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<td>MUA 381</td>
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<td>MUA 382</td>
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<tr>
<td>MUA 386</td>
<td>Percussion Major-Upper Div</td>
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<td>Private study at the concentration level.</td>
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<tr>
<td>MUA 387</td>
<td>Percussion Major-Upper Div</td>
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<td>Private study at the concentration level.</td>
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<tr>
<td>MUA 400</td>
<td>Senior Recital</td>
<td>0 cr</td>
<td>The Senior Recital provides a culminating performance experience of professional quality required of all concentrations of Bachelor of Music students. Committee approval needed to pass the course. To be taken in conjunction with the appropriate 300 or 400 level applied music course.</td>
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<td>MUA 401</td>
<td>Piano Major-Performance</td>
<td>1 cr</td>
<td>Private study in Piano at the major level.</td>
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<td>MUA 402</td>
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<td>MUA 403</td>
<td>Piano Major-Performance</td>
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<td>MUA 421</td>
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<td>MUA 431</td>
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<td>MUA 441</td>
<td>Viola Major-Performance</td>
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<td>MUA 442</td>
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<td>MUA 443</td>
<td>Viola Major-Performance</td>
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<tr>
<td>MUA 451</td>
<td>Violoncello Major-Performance</td>
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<td>Private study at the major level</td>
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<tr>
<td>MUA 452</td>
<td>Violoncello Major-Performance</td>
<td>2 cr</td>
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<td>MUA 453</td>
<td>Violoncello Major-Performance</td>
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<td>MUA 461</td>
<td>String Bass Major-Performance</td>
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<td>MUA 462</td>
<td>String Bass Major-Performance</td>
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</tr>
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<td>MUA 463</td>
<td>String Bass Major-Performance</td>
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<tr>
<td>MUA 471</td>
<td>Harp Major-Performance</td>
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<td>MUA 472</td>
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<tr>
<td>MUA 473</td>
<td>Harp Major-Performance</td>
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<tr>
<td>MUA 481</td>
<td>Guitar Major-Performance</td>
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<td>MUA 482</td>
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<td>MUA 483</td>
<td>Guitar Major-Performance</td>
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<td>MUA 486</td>
<td>Percussion Major-Performance</td>
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<td>MUA 487</td>
<td>Percussion Major-Performance</td>
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<tr>
<td>MUA 488</td>
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<tr>
<td>MUA 500</td>
<td>Graduate Recital</td>
<td>1 cr</td>
<td>Graduate recital. To be taken in conjunction with a 500-level applied music course.</td>
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<td>MUA 501</td>
<td>Piano</td>
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<td>MUA 502</td>
<td>Piano</td>
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<td>Private study at the graduate level.</td>
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<td>MUA 503</td>
<td>Piano</td>
<td>3 cr</td>
<td>Private study at the graduate level.</td>
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<tr>
<td>MUA 507</td>
<td>Applied Collaborative Piano</td>
<td>1 cr</td>
<td>The Director for Collaborative Keyboard studies will meet with the student enrolled in Applied Collaborative Piano to assign literature, which will be studied during the semester. For MUA 507, the student meets with the instructor 30 minutes each week to study vocal music and at least 1 collaborative assignment with strings, winds or brass. The goal of the course is to learn standard repertoire for piano with voice and various instruments.</td>
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<tr>
<td>MUA 508</td>
<td>Applied Collaborative Piano</td>
<td>2 cr</td>
<td>The Director for Collaborative Keyboard studies will meet with the student enrolled in Applied Collaborative Piano to assign literature, which will be studied during the semester. For MUA 508, the student meets with the instructor 60 minutes each week to study vocal music and collaborates with at least 2 different instrument types (string, woodwinds, brass). The goal of the course is to learn standard repertoire for piano with voice and various instruments.</td>
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<tr>
<td>MUA 509</td>
<td>Applied Collaborative Piano</td>
<td>3 cr</td>
<td>The Director for Collaborative Keyboard studies will meet with the student enrolled in Applied Collaborative Piano to assign literature, which will be studied during the semester. For MUA 509, the student meets with the instructor 60 minutes each week to study vocal music and collaborates with 3 different instrument types (string, woodwinds, brass). The goal of the course is to learn standard repertoire for piano with voice and various instruments.</td>
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### Courses

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<th>Credits</th>
<th>Description</th>
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<td>MUA 513</td>
<td>Organ</td>
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<td>MUA 521</td>
<td>Voice</td>
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<td>Voice</td>
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<td>MUA 551</td>
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<td>MUA 553</td>
<td>Violoncello</td>
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<tr>
<td>MUA 561</td>
<td>String Bass</td>
<td>1 cr</td>
<td>Private study at the graduate level.</td>
</tr>
<tr>
<td>MUA 562</td>
<td>String Bass</td>
<td>2 cr</td>
<td>Private study at the graduate level.</td>
</tr>
<tr>
<td>MUA 563</td>
<td>String Bass</td>
<td>3 cr</td>
<td>Private study at the graduate level.</td>
</tr>
<tr>
<td>MUA 581</td>
<td>Guitar</td>
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<td>Guitar</td>
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<td>Private study at the graduate level.</td>
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<td>MUA 583</td>
<td>Guitar</td>
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<td>Private study at the graduate level.</td>
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<tr>
<td>MUA 586</td>
<td>Percussion</td>
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<td>MUA 587</td>
<td>Percussion</td>
<td>2 cr</td>
<td>Private study at the graduate level.</td>
</tr>
<tr>
<td>MUA 588</td>
<td>Percussion</td>
<td>3 cr</td>
<td>Private study at the graduate level.</td>
</tr>
<tr>
<td>MUA 599</td>
<td>Curr, Ped &amp; Instruct Techniques</td>
<td>2 cr</td>
<td>This is an integrated study concentrating on the following subjects: literature, pedagogy, studio performance and master class. Studies focus on pedagogy, both private and group teaching methods, and instructional techniques grounded in research.</td>
</tr>
</tbody>
</table>

### Applied Music B (MUB)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
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<tr>
<td>MUB 101</td>
<td>Flute Elective</td>
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<td>MUB 102</td>
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<tr>
<td>MUB 111</td>
<td>Oboe - Elective</td>
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<td>MUB 112</td>
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<td>MUB 121</td>
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<tr>
<td>MUB 131</td>
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<td>French Horn - Elective</td>
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<tr>
<td>MUB 162</td>
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<td>MUB 171</td>
<td>Trombone - Elective</td>
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<td>Credits</td>
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<td>MUB 181</td>
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<tr>
<td>MUB 186</td>
<td>Tuba - Elective</td>
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<td>MUB 187</td>
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<td>MUB 202</td>
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<td>MUB 211</td>
<td>Oboe Major-Lower Division</td>
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<td>MUB 212</td>
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<td>MUB 221</td>
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<td>MUB 222</td>
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<td>MUB 231</td>
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<td>MUB 232</td>
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<td>MUB 251</td>
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<td>MUB 261</td>
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<td>MUB 262</td>
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<td>MUB 271</td>
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<td>MUB 272</td>
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<td>Course Code</td>
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<td>Credits</td>
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<td>Tuba-Major Upper Division</td>
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<td>MUB 387</td>
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<td>MUB 432</td>
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<td>MUB 441</td>
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<td>MUB 451</td>
<td>Trumpet-Cornet-Major Perform</td>
<td>1 cr</td>
<td>Private study at the major level.</td>
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<td>MUB 452</td>
<td>Trumpet-Cornet-Major Perform</td>
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<td>MUB 453</td>
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<td>3 cr</td>
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<td>MUB 461</td>
<td>French Horn-Major Performance</td>
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<td>MUB 462</td>
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<td>MUB 463</td>
<td>French Horn-Major Performance</td>
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<td>MUB 471</td>
<td>Trombone-Major Performance</td>
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<td>MUB 473</td>
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<td>Baritone-Euphonium Maj Perform</td>
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<td>MUB 482</td>
<td>Baritone-Euphonium Maj Perform</td>
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<td>MUB 486</td>
<td>Tuba-Major Performance</td>
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<td>MUB 487</td>
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<td>MUB 488</td>
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<tr>
<td>MUB 501</td>
<td>Flute</td>
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<td>MUB 502</td>
<td>Flute</td>
<td>2 cr</td>
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<tr>
<td>MUB 503</td>
<td>Flute</td>
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<td>MUB 511</td>
<td>Oboe</td>
<td>1 cr</td>
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<td>MUB 512</td>
<td>Oboe</td>
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<td>MUB 513</td>
<td>Oboe</td>
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<td>MUB 521</td>
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<td>Clarinet</td>
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<tr>
<td>MUB 523</td>
<td>Clarinet</td>
<td>3 cr</td>
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MUB 531  Bassoon  Private study at the graduate level.  1 cr
MUB 532  Bassoon  Private study at the graduate level.  2 cr
MUB 533  Bassoon  Private study at the graduate level.  3 cr
MUB 541  Saxophone  Private study at the graduate level.  1 cr
MUB 542  Saxophone  Private study at the graduate level.  2 cr
MUB 543  Saxophone  Private study at the graduate level.  3 cr
MUB 551  Trumpet-Cornet  Private study at the graduate level.  1 cr
MUB 552  Trumpet-Cornet  Private study at the graduate level.  2 cr
MUB 553  Trumpet-Cornet  Private study at the graduate level.  3 cr
MUB 561  French Horn  Private study at the graduate level.  1 cr
MUB 562  French Horn  Private study at the graduate level.  2 cr
MUB 563  French Horn  Private study at the graduate level.  3 cr
MUB 571  Trombone  Private study at the graduate level.  1 cr
MUB 572  Trombone  Private study at the graduate level.  2 cr
MUB 573  Trombone  Private study at the graduate level.  3 cr
MUB 581  Baritone Horn  Private study at the graduate level.  1 cr
MUB 582  Baritone Horn  Private study at the graduate level.  2 cr
MUB 583  Baritone Horn  Private study at the graduate level.  3 cr
MUB 586  Tuba  Private study at the graduate level.  1 cr
MUB 587  Tuba  Private study at the graduate level.  2 cr
MUB 588  Tuba  Private study at the graduate level.  3 cr

Argument (ARG)

ARG 120  Critical Thinking  3 cr
This course will examine complex types of reasoning, including statistical judgment, decision making, and causal and analogical thinking. Emphasis will be placed on the analysis of concrete examples of reasoning in various fields. Students will learn how to evaluate arguments, fallacies, common errors, and biases in reasoning and decision making. Identical with PHL 120. Credit cannot be received for both ARG 120 and PHL 120. Fulfills the General Education requirement.

ARG 210  Argumentation  3 cr
Examines the role of argumentation in a democratic society and aims to develop critical thinking and reasoned advocacy. Course makes functional a knowledge of tests of evidence and the modes of logical reasoning. Students participate in various forms of argumentation and debating. Identical with ARG 210. Students cannot receive credit for both ARG 210 and CA 210. Fee.

ARG 222  Rhetoric, Culture and Society  3 cr

ARG 321  Symbolic Logic  3 cr
A study of sentential and predicate logics and related topics. Identical with 321. Credit cannot be received for both ARG 321 and PHL 321.

ARG 371  Approaches to English Grammar  3 cr
A course designed primarily to help education majors translate between the languages of conventional grammar and the syntactical grammar relevant to the teaching of English at Precollege levels. Consideration will also be given to the rationales basic to the formation of different grammars and to methods of presenting grammatical material in a classroom situation. Non-education majors interested in a sophisticated approach to the study of grammar might also benefit from this course. Identical with EH 371. Credit cannot be received for both ARG 371 and EH 371. Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.

ARG 390  Special Topics -  3 cr
Different figures, periods, or topics of significance in Argument will be studied as announced. May be repeated, when content varies, for a total of six hours. Requires Sophomore, Junior or Senior standing.

ARG 402  Rhetoric: Ancient and Modern  3 cr
Readings in rhetorical theory, ancient and modern, are applied in specific writing assignments with encourage students to adopt a point of view and address a specific audience. Identical to EH 402. If credit for ARG 402 is received, then credit cannot be received for EH 402. Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.
ARG 481  Studies in Rhetoric  3 cr  Seminar in specific topics dealing with writing, rhetoric, or language studies. May be repeated once for credit when course content varies. Identical with EH 481. Credit cannot be received for both ARG 481 and EH 481 when it is on the same specific topic. Junior standing required.  Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.

ARG 490  Special Topics  3 cr  An investigation of issues and concepts in Argument for advanced undergraduate students. May be repeated, when content varies, for a total of six hours. Prerequisites: Junior or Senior standing.

ARG 492  Seminar  3 cr

ARG 494  Directed Studies  1 TO 3 cr  Directed research in Argument under the guidance of a member of the department. Credit according to the magnitude of the individual project. May be repeated, if content varies, for a total of six hours. Prerequisites: Junior or Senior standing and approval of directing professor and department chair.

Art Education (AED)

AED 301  Visual Arts for Young Children  3 cr  Exploration of knowledge and skills in the arts appropriate for young children. Art techniques and media are explored.

AED 440  Arts for Learning  3 cr  Using the arts to promote physical, social, emotional, and cognitive development.

Co-requisite: AED 441

Pre-requisite: SED 340 Minimum Grade of C and SED 341 Minimum Grade of C.

AED 441  Art in the N-12 Program  3 cr  Art and the intellectual, creative, and emotional growth of adolescents and youth. The study of appropriate techniques and materials for teaching studio art and crafts, art history, appreciation and aesthetics, and participation in humanities programs at the secondary level. Laboratory practice in the secondary school. Restricted to N-12 art majors.  Prerequisites: Completion of two-thirds of teaching field.

Co-requisite: AED 440

Pre-requisite: SED 340 Minimum Grade of C and SED 341 Minimum Grade of C.

AED 494  Dir St -  1 TO 3 cr  No more than two directed study courses can be counted toward the Bachelor's degree and Class B Certificate.

Prerequisite: Permission of department chair.

AED 501  Trn-Prac Tch Art Elem Sc  3 cr  Orient the student toward the artistic interests and creative abilities of children in the elementary school, and developing attitudes of respect for individuality and creativity. Included are laboratory experiences with art materials and research into appropriate techniques of teaching art.

AED 502  Trn-Prac Tch Art Sec Sch  3 cr  Current trends and practices in curriculum, instruction, selection of materials, and derivation of procedures for guiding learning in art in the secondary school.

AED 540  Art in the N-12 Program  3 cr  Art and the intellectual, creative, and emotional growth of children. The role of art in the instructional program, examination of objectives in an art program, and the study of appropriate techniques and materials for teaching art and crafts at the elementary level. Restricted to N-12 art majors.  Pre-requisite: SED 555 Minimum Grade of B and SED 559 Minimum Grade of B and EPY 525 Minimum Grade of B.

AED 560  Grad Research Seminar  3 cr  Research in problems confronting American education. Selected topics are explored by students which provide the basis for seminar discussions. A seminar paper is presented by each student. This course also includes a field-based practicum. Prerequisite: Permission of department chair.

AED 590  Sp Top -  3 cr  Current topics of special concern to secondary educators. A different topic will be used each time the course is offered. No more than 6 hours can be applied toward a graduate degree. Prerequisite: Permission of department chair.

AED 594  Dir St - Research  1 TO 3 cr  Students explore through directed study problems and issues of special interest or significance in Art Education. No more than 3 hours of any departmental 594 courses can be applied toward a degree program. Prerequisite: Permission of department chair.

AED 595  Internship  1 TO 6 cr  The internship is a supervised learning experience in a work setting similar to that in which the educator will eventually be employed. The internship provides the students with an opportunity to apply the theories and concepts learned during the graduate program of study.

Pre-requisite: (PRAXIS-Art Cont Knowledge 158 or PRAXIS-Art Cont Knowledge 158 )

Art History (ARH)

ARH 100  Survey of Art  3 cr  A survey of major periods of artistic development from prehistoric times to the present. Note: this course cannot be counted toward fulfilling degree requirements for majors in Studio Art, Art, or Art History. Fee. Core course
ARH 103  Art History I  3 cr
An examination of the history of the Western tradition of art from cave painting through the Middle Ages including but not limited to Ancient Egypt, Ancient Greece, Ancient Rome, and Romanesque, and Gothic Europe. Students will be introduced to the descriptive and critical analysis of works of art and architecture as well as their cultural, economic, religious, and historical context.

ARH 123  Art History II  3 cr
An examination of the history of the Western tradition of art from the late Middle Ages to the 20th century including but not limited to the periods of the Renaissance, the Baroque, Neo-Classicism, Romanticism, Impression, Cubism, and Pop Art. Students will be introduced to the descriptive and critical analysis of works of art and architecture as well as their cultural, economic, religious, and historical context.

ARH 203  Survey of Non-Western Art  3 cr
Survey of the visual arts from five broad geographic areas of the world outside of Europe: Asia, Middle East, Africa, Oceania (the islands of the Pacific Ocean), and the Americas (North, Central, and South). Fee.

ARH 245  History of Graphic Design  3 cr
A survey of graphic design from the ancient Sumerians to the present day.
Pre-requisite: ARH 123 Minimum Grade of D.

ARH 248  History of Photography  3 cr
A comprehensive study of the medium of photography. The course traces chronologically and thematically the evolution of an independent art form. The focus of the course is the growth of this contribution to the visual arts, through the inseparable aspects of science and art. Fee.
Pre-requisite: ARH 123 Minimum Grade of D.

ARH 250  African Art  3 cr
This course is designed as a basic orientation to the arts of Africa and the interpretation of experience as witnessed in various African visual art forms. The course will focus on the major civilization and/or nations south of the Sahara Desert and their stylistic developments. Emphasis will be placed on the aesthetic approach of African artists and the influence of their art on western culture. Fee.

ARH 290  Special Topics -  3 cr
Different subjects or themes in art or architectural history as announced. This course may be repeated twice when content varies, for a maximum of nine credit hours. Fee.

ARH 304  Ancient Grk Art and Architect  3 cr
Architecture, sculpture, and painting in Ancient Greece and the expansion and influence of Greek culture in the Ancient World. Identical to CLA 304. Credit cannot be received for both ARH 304 and CLA 304. Fee.
Pre-requisite: (ARH 103 Minimum Grade of D or CLA 103 Minimum Grade of D) or CLA 110 Minimum Grade of D.

ARH 306  Roman Art  3 cr
Architecture, sculpture, and painting in Ancient Rome and its empire. Identical to CLA 306. Credit cannot be received for both ARH 306 and CLA 306. Fee.
Pre-requisite: (ARH 103 Minimum Grade of D or CLA 103 Minimum Grade of D) or CLA 110 Minimum Grade of D.

ARH 312  Medieval Art and Architecture  3 cr
This course is a survey of the art and architecture of the Medieval world from the legalization of Christianity in AD 313 to the end of the Gothic Period. Fee.
Pre-requisite: (ARH 103 Minimum Grade of D or CLA 103 Minimum Grade of D).

ARH 322  Northern Renaissance Art  3 cr
Art of Flanders, Germany, and France in the 14th, 15th, and 16th centuries. Fee.
Pre-requisite: ARH 123 Minimum Grade of D. ARH 123 can be taken concurrently with this course.

ARH 324  Italian Early Renaissance  3 cr
Art of 14th and 15th century Italy. Fee.
Pre-requisite: ARH 123 Minimum Grade of D. ARH 123 can be taken concurrently with this course.

ARH 326  16th Century Italian Art  3 cr
Art of the Italian High Renaissance and Mannerist Periods. Fee.
Pre-requisite: ARH 123 Minimum Grade of D. ARH 123 can be taken concurrently with this course.

ARH 330  Baroque Art of Southern Europe  3 cr
A study of painting, sculpture, and architecture in Italy and Spain during the 17th and early 18th centuries. Fee.
Pre-requisite: ARH 123 Minimum Grade of D. ARH 123 can be taken concurrently with this course.

ARH 332  Baroque Art and Architecture  3 cr
This course is a survey of the art and architecture of Seventeenth Century Europe. Fee.
Pre-requisite: ARH 123 Minimum Grade of D.

ARH 335  18th Century Art and Arch  3 cr
Survey of the art and architecture of the Eighteenth Century. Fee.
Pre-requisite: ARH 123 Minimum Grade of D.

ARH 340  Early Modern Art  3 cr
A study of art developments in the 19th and early 20th centuries. Fee.
Pre-requisite: ARH 123 Minimum Grade of D.

ARH 343  African-American Art  3 cr
Investigation of the art of African-Americans and the historical and social contexts in which the works were produced. Major periods of concentration include slavery, post-slavery, and the 20th century. Fee.

ARH 344  Contemporary Art  3 cr
A study of art developments since 1960. Fee.
ARH 345 American Arts 1600 - 1940 3 cr
American painting, graphics and sculpture from the Colonial period to 1940. Fee.
Pre-requisite: ARH 123 Minimum Grade of D.

ARH 346 Amer Architecture 1600-1940 -W 3 cr
American architecture from the colonial period to 1940. Fee.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and ARH 123 Minimum Grade of D.

ARH 360 Traineeship in Museum Work 3 cr
This course is evaluated experience in museum work at an accredited institution of art. It may be repeated once if the experience differs. Prerequisites: Fifteen hours of Art History with a grade of C or above and permission of the course director.

ARH 362 Internship Architect Preservatn 3 cr
Evaluated experience in architectural preservation at the Mobile Historic Development Commission. Cannot be used to fulfill requirements for the Art History major or minor. The course may not be repeated.
Pre-requisite: ARH 304 Minimum Grade of D or ARH 346 Minimum Grade of D or ARH 406 Minimum Grade of D or ARH 415 Minimum Grade of D. ARH 304 and ARH 346 and ARH 406 and ARH 415 can be taken concurrently with this course.

ARH 370 Philosophy of Art 3 cr
Acquaints students with main issues in aesthetics. Includes such issues as the nature and function of art and the criteria of aesthetic judgment. Identical with PHL 370. Credit cannot be received for both ARH 370 and PHL 370.

ARH 390 Special Topics - 3 cr
Different subjects or themes in art or architectural history as announced. This course may be repeated twice when content varies, for a maximum of nine credit hours. Fee.

ARH 415 Gothic Architecture 3 cr
A study of art, architecture and sculpture during the Gothic Age, with special emphasis on France, Germany, England, Italy, and Scandinavia. Fee.
Pre-requisite: ARH 103 Minimum Grade of D. ARH 103 can be taken concurrently with this course.

ARH 434 Baroque Art Flanders-Holland 3 cr
A study of the painting of the major artists of Baroque Flanders and Holland; the work of Rubens, Hals, Rembrandt, Vemeer, and others will be studied. Fee.
Pre-requisite: ARH 123 Minimum Grade of D. ARH 123 can be taken concurrently with this course.

ARH 480 Women in Art-W 3 cr
A study of women throughout art history as both the subject and the creator of art. Prerequisite: Nine hours of Art History above the 200 level. Fee.
Pre-requisite: (EH 101 Minimum Grade of D or EH 102 Minimum Grade of D).

ARH 492 Seminar - W - 3 cr
This seminar will treat variable subjects. This course may be repeated twice when content varies, for a maximum of nine credit hours. Fee.
Pre-requisite: (ARH 103 Minimum Grade of D or CLA 103 Minimum Grade of D) and ARH 123 Minimum Grade of D and (ARH 344 Minimum Grade of D or ARH 244 Minimum Grade of D) and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of C).

ARH 493 Methodology of Art History-W 3 cr
An investigation of methodologies used by art historians in their examination of artistic production. Prerequisite: 9 hours of ARH courses above the 200 level.

ARH 494 Directed Studies 3 cr
Research in a selected topic in art or architectural history under the direction of a faculty member, resulting in a scholarly paper. Prerequisites: Nine hours in Art History numbered 300 or higher and permission of the instructor. Fee. This course may be repeated twice for a total of nine credit hours.

ARH 498 Art History Senior Thesis 3 cr
Art History B.F.A. students will identify and carry out independent scholarly research on an art history topic over two semesters with the guidance of a faculty committee. At the end of the second semester, the project will be concluded with submission of the polished thesis and a thesis defense presented through a formal session given to the Visual Arts faculty. This course is to be taken as two sequential, three-credit units.
Pre-requisite: ARH 493 Minimum Grade of C. ARH 493 can be taken concurrently with this course.

ARH 499 Honors Senior Thesis - H (W) 3 cr
Honors students will identify and carry out independent scholarly research on an art history topic over two semesters with the guidance of a faculty mentor. At the end of the first semester, the project will be concluded with a formal oral presentation to the Visual Arts Faculty. At the end of the second semester, the students will submit the senior thesis. The work from both semesters will be graded by a three-member faculty committee, chaired by the mentor. This course is to be taken as two sequential, three-credit course units.
Pre-requisite: HON 301 Minimum Grade of D.

ARH 590 Special Topics - 3 cr
Different subjects or themes in art or architectural history as announced. This course may be repeated twice when content varies, for a maximum of nine credit hours. Fee.
Pre-requisite: ARS 103 Minimum Grade of D and ARS 123 Minimum Grade of D. ARS 103 and ARS 123 can be taken concurrently with this course.
Art Studio (ARS)

ARS 101  Art Appreciation  3 cr
A broad introduction to the nature, vocabulary, and media of the visual arts of drawing, painting, prints, the camera arts, graphic design, sculpture, crafts, and architecture.

ARS 121  Perceptual Drawing I  3 cr
An introductory course with emphasis on the development of drawing skills to realistically represent natural and man-made forms using dry drawing media.

ARS 122  Perceptual Drawing II  3 cr
A continuation of ARS 121 using wet and mixed drawing media.
Pre-requisite: ARS 121 Minimum Grade of D.

ARS 123  Two-Dimensional Design  3 cr
The study and application of art elements and principles, and principles of perception, for the purpose of increasing the student's skill in communicating visually with paints and other two-dimensional media.

ARS 124  Three-Dimensional Design  3 cr
A study and application of art principles to three-dimensional problems.

ARS 155  Introduction to Print Media  3 cr
This course will provide students with a introductory education in the materials, methods, and history of the varied printmaking techniques. Students will gain a basic knowledge of the print processes and issues through the develop of a body of original work.

ARS 200  Intro to Animation  3 cr
This course introduces the student to the basic concepts of animation. Emphasis will be on the processes involved in creation of animation stressing teamwork, storyboarding, hand drawing, clay animation, motion, and balance. Digital camera, scanning and computer editing are critical skills that make the foundation for this class. Study of the history of animation and terminology will be included in this curriculum. Prerequisite: ARS 121. Fee. Pre-requisite: ARS 121 Minimum Grade of C.

ARS 201  Two Dimensional Animation I  3 cr
This course will offer skill development in the use of software to develop storyboards and 2-dimensional animation including creating, importing and sequencing media elements to create interactive motion graphics. Emphasis will be on conceptualization, creativity, and visual aesthetics. This course takes the students through various aspects of animation using 2 dimensional software. Developing concepts, storyboarding and production of several 2 dimensional animations will be accomplished. Pre-requisite: ARS 122 Minimum Grade of D and ARS 121 Minimum Grade of D and ARS 230 Minimum Grade of D.

ARS 202  Three Dimensional Animation I  3 cr
This course focuses on storytelling techniques through animation and the principles of animation. It covers the fundamentals of scene navigation, modeling, cameras, and lightning. Students will be introduced to 3D technology and how it is used to film and video game production. Pre-requisite: ARS 200 Minimum Grade of D and ARS 201 Minimum Grade of D.

ARS 204  Experimental Animation  3 cr
This course offers a framework in which students will explore and develop aesthetically progressive concepts and professional practices in their personal animation art-making. The students will develop a unique artistic voice in the creation of visually based animation using experimentation, exploration, traditional and non-traditional mediums. Pre-requisite: ARS 200 Minimum Grade of C and ARS 122 Minimum Grade of C and ARS 123 Minimum Grade of C.

ARS 211  Glass Art, Science, History  3 cr
A survey of glass objects from 5,000 years ago, leads to a focus on the contemporary and international Studio Glass Movement in art. Methodologies of glass making and the work of artists utilizing the medium will be explored. The physical properties of glass including coloration and transition range ( heating and cooling) will be discussed and demonstrated with hands-on instruction. Fee.

ARS 212  Intro to Glass Blowing  3 cr
The manipulation, construction, and experimentation with glass as a sculptural and craft medium. Emphasis will be on glass blowing. Other investigations may include surface design, sandblasting, painting, and enameling on glass. 3 hours minimum of additional lab time beyond class time are required per week. Fee.

ARS 222  Figure Drawing I  3 cr
A study of the human figure using various drawing (dry) media. Fee. Pre-requisite: ARS 122 Minimum Grade of D and ARS 123 Minimum Grade of D.

ARS 225  Conceptual Drawing I  3 cr
An introduction to the developmental process of drawing as an art form using various subject matter and drawing media. Pre-requisite: ARS 122 Minimum Grade of D and ARS 123 Minimum Grade of D.

ARS 231  Painting I  3 cr
An introduction to the techniques and concepts of oil painting using various subject matter. Pre-requisite: ARS 122 Minimum Grade of D and ARS 123 Minimum Grade of D.

ARS 232  Painting II  3 cr
A continuation of ARS 231 with an emphasis on color, composition and technical facility in oil paint. Pre-requisite: ARS 231 Minimum Grade of D.
ARS 241 Intro to Ceramics 3 cr
Introduction to the exploration of basic hand building and wheel techniques of working with clay. Included will be basic design considerations for traditional pottery forms as well as simple sculptural forms. There will be exposure to techniques for glazing and basic firing.

ARS 250 Lithography 3 cr
An introduction to lithography. Technical skills related to processing and printing an edition will be studied. The course will consist of studio practice, lectures, quizzes, and critiques.
Pre-requisite: ARS 121 Minimum Grade of C and ARS 123 Minimum Grade of D.

ARS 251 Intaglio/Etching 3 cr
An introduction to Intaglio printing techniques also known as etching. Technical skills related to drawing, processing, and printing the metal plates will be studied. The class will consist of studio problems in plate making and printing along with lectures, quizzes, and critiques.
Pre-requisite: ARS 122 Minimum Grade of D and ARS 123 Minimum Grade of D. ARS 122 and ARS 123 can be taken concurrently with this course.

ARS 252 Woodcut/Relief 3 cr
A study of relief printmaking. Techniques may include and are not limited to relief, linoleum cut, and wood engraving. The course will consist of studio practice, lectures, quizzes, and critiques. Emphasis will be given to the skills involved in the use of hand tools to cut the image and skills used in printing and editioning the block.
Pre-requisite: ARS 121 Minimum Grade of D and ARS 123 Minimum Grade of D.

ARS 253 Silkscreen/Serigraphy 3 cr
An introduction to silkscreen printing as a fine art form. The class will explore various techniques used in waterbased screen printing, from simple stencils of hand drawn and cut paper designs to advanced photo processes. The course will consist of studio practice, lectures, quizzes, and critiques. Technical methods involved in color use, processing, and printing will be studied.
Pre-requisite: ARS 121 Minimum Grade of C and ARS 123 Minimum Grade of C.

ARS 255 Beginning Printmaking 3 cr
This course will provide students with a fundamental education in the materials, methods, and history of the varied printmaking techniques. Students will gain a basic knowledge of the print processes and issues through the development of a body of original work.
Pre-requisite: ARS 122 Minimum Grade of C and ARS 123 Minimum Grade of C and ARS 121 Minimum Grade of C. ARS 122 can be taken concurrently with this course.

ARS 261 Sculpture I 3 cr
A basic course with additive sculpture materials dealing with problems of mass, volume, and form.
Pre-requisite: ARS 124 Minimum Grade of D.

ARS 262 Sculpture II 3 cr
An introduction to basic metal fabrication, including cutting, brazing, and welding both ferrous and non-ferrous materials. Pre-requisite: ARS 261 Minimum Grade of D. ARS 261 can be taken concurrently with this course.

ARS 271 Introduction to Graphic Design 3 cr
An introduction to skills and techniques used in graphic design, problems in visual priorities, and use of selected materials. Restricted to Majors. Fee.
Pre-requisite: ARS 122 Minimum Grade of D and ARS 123 Minimum Grade of D.

ARS 272 Typography 3 cr
This class will examine typography as a visual communication tool. Restricted to students who have been accepted into the graphic design program. Fee.
Pre-requisite: ARS 271 Minimum Grade of C and ARS 273 Minimum Grade of C.

ARS 273 Graphic Design Applications 3 cr
An introduction to skills and techniques used in graphic design, problems in visual priorities, and use of selected materials. Restricted to Majors. Fee.
Pre-requisite: ARS 122 Minimum Grade of D and ARS 123 Minimum Grade of D.

ARS 280 Intro to Photography 3 cr
An introduction to the technical and aesthetic aspects of photography. Investigation of picture-making problems and control of photographic media. Involves the use of color transparency materials and an introduction to black and white processing enlarging. Students must have 35 mm single lens reflex cameras capable of being operated in the manual exposure mode. Fee.

ARS 281 Special Topics - 3 TO 6 cr
A lower level studio, lecture, or seminar course treating a special medium, subject, or theme, as announced. This course may be repeated when the topic varies for a maximum of 6 credit hours.

ARS 301 2D Animation II 3 cr
This course will continue to develop skills in the use of traditional mediums as well as digital software to create storyboards and 2-dimensional animation including creating, importing and sequencing media elements. Emphasis will be on conceptualization, creativity, and visual aesthetics. This course takes the students through various aspects of animation using 2 dimensional software. Developing concepts, storyboarding and the production of several dimensional animations will be accomplished.
Pre-requisite: ARS 201 Minimum Grade of C.
**ARS 302 3D animation II** 3 cr  
This course focuses on storytelling techniques through animation and the principles of animation. It will reinforce the fundamentals of scene navigation, modeling, cameras, and lighting. Students will become proficient in the use of 3D technology and how it is used for film and video game production.  
Pre-requisite: ARS 202 Minimum Grade of C.

**ARS 304 Digital Modeling** 3 cr  
This course introduces the concepts and techniques used in the creation of three dimensional form in a digital space. Emphasis will be on the practical use and creation of three dimensional models for animation and texturing. The course will also explore how formal choices impact meaning, and discuss contemporary artists who incorporate digital modeling into their work.  
Pre-requisite: ARS 122 Minimum Grade of C and ARS 124 Minimum Grade of C and ARS 200 Minimum Grade of C.

**ARS 311 Kiln Formed Glass** 3 cr  
The exploration of glass formed through a variety of kiln working methods including fusing, slumping, pate de verre, and casting. Fee.

**ARS 312 Intermediate Glass Blowing** 3 TO 6 cr  
A continuation of ARS 212 focusing on refinement of form and investigation of complex techniques in order to develop proficiency in glass blowing as a means to service individual creativity. The use of glass color is explored. A minimum of 3 additional hours of lab time outside of class time are required weekly. Fee.  
Pre-requisite: ARS 212 Minimum Grade of D and ARS 124 Minimum Grade of D. ARS 122 and ARS 124 Minimum Grade of D and ARS 241 Minimum Grade of C.

**ARS 322 Figure Drawing II** 3 cr  
Further study of the human figure using various drawing (wet and dry) media.  
Pre-requisite: ARS 222 Minimum Grade of D.

**ARS 325 Conceptual Drawing II** 3 cr  
A continuation of ARS 225 with emphasis on concept driven work. Fee.  
Pre-requisite: ARS 225 Minimum Grade of D.

**ARS 326 Color Theory** 3 cr  
A studio course in the nature, theory and application of color in an aesthetic context.  
Pre-requisite: ARS 222 Minimum Grade of C or ARS 225 Minimum Grade of C.

**ARS 331 Painting III** 3 TO 12 cr  
A continuation of ARS 231 and 232 with emphasis on conceptual exploration in oil and/or water media paint. May be repeated for a maximum of 12 hours.  
Pre-requisite: ARS 231 Minimum Grade of D and ARS 232 Minimum Grade of D. ARS 231 and ARS 232 can be taken concurrently with this course.

**ARS 341 Intermediate Ceramics** 3 TO 9 cr  
A continuation of ARS 241 with emphasis on hand building or wheel techniques. May be repeated for a total of 9 semester hours credit.  
Pre-requisite: ARS 122 Minimum Grade of D and ARS 124 Minimum Grade of D and ARS 241 Minimum Grade of D. ARS 122 and ARS 124 and ARS 241 can be taken concurrently with this course.

**ARS 351 Intermediate Printmaking** 3 TO 12 cr  
Further work in printmaking. Students may work in one or more of the following print media: Intaglio, lithography, relief, screen printing. Students must have taken the 200 level of the appropriate print media to move to intermediate level of that same media. The course may be repeated for a maximum of 9 semester hours.  
Pre-requisite: ARS 250 Minimum Grade of D or ARS 251 Minimum Grade of D or ARS 252 Minimum Grade of D or ARS 253 Minimum Grade of D.

**ARS 352 Relief/Woodcut** 3 cr  
Building on the relief techniques covered in ARS 255 Beginning Printmaking, this course will provide students with a deeper education in the materials, methods, and history of Relief/Woodcut printing. Students will gain knowledge of the print processes and issues through the development of a body of original work.  
Pre-requisite: ARS 155 Minimum Grade of C or ARS 255 Minimum Grade of C.

**ARS 353 Intaglio/Etching** 3 cr  
Building on the intaglio techniques covered in ARS 255 Beginning Printmaking, this course will provide students with an education in the materials, methods, and history of Intaglio/Etching. Students will gain knowledge of the print processes and issues through the development of a body of original work.  
Pre-requisite: ARS 155 Minimum Grade of C or ARS 255 Minimum Grade of C.

**ARS 354 Screenprint/Serigraphy** 3 cr  
Building on the Screenprint/Serigraphy techniques covered in ARS 255 Beginning Printmaking, this course is an introductory course in water-based screen printing, designed to present the basic techniques and concepts of the medium as a fine art form.  
Pre-requisite: ARS 155 Minimum Grade of C or ARS 255 Minimum Grade of C.

**ARS 355 Lithography** 3 cr  
Building on the lithography techniques covered in ARS 255 Beginning Printmaking, this course will provide students with an intermediate education in the materials, methods, and history of lithography. Students will gain a knowledge of the print processes and issues through the development of a body of original art work.  
Pre-requisite: ARS 155 Minimum Grade of C or ARS 255 Minimum Grade of C.
ARS 361 Sculpture III 3 TO 6 cr
An introduction to direct carving processes with wood and stone. This course may be repeated for a total of 6 semester hours credit. Pre-requisite: ARS 262 Minimum Grade of D. ARS 262 can be taken concurrently with this course.

ARS 362 Sculpture IV 3 TO 6 cr
Advanced mold making techniques. This course may be repeated for a total of 6 semester hours credit. Pre-requisite: ARS 361 Minimum Grade of D. ARS 361 can be taken concurrently with this course.

ARS 373 Graphic Design Identity Systems 3 cr
An intermediate course developing design skills used in the production of printed materials for visual communications with an emphasis on logos, letterheads, brochures and posters. Fee. Pre-requisite: ARS 272 Minimum Grade of C and ARS 273 Minimum Grade of C.

ARS 374 Publication Design 3 cr
An intermediate course developing design skills used in the production of printed materials for visual communications with an emphasis on newsletters, magazines, and newspaper graphics. Fee. Pre-requisite: ARS 272 Minimum Grade of C and ARS 273 Minimum Grade of C.

ARS 375 Digital Graphic Design 3 cr
An advanced level course utilizing computers to produce graphic design work for printed and digital media. Fee. Pre-requisite: ARS 373 Minimum Grade of C and ARS 374 Minimum Grade of C.

ARS 376 Illustration 3 cr
Conceptual approaches, materials and techniques used to solve problems in illustration, emphasizing developing rendering skills. Fee. Pre-requisite: (ARS 222 Minimum Grade of C or ARS 225 Minimum Grade of C) or (ARS 373 Minimum Grade of C or ARS 374 Minimum Grade of C).

ARS 381 Intermediate Photography I 3 cr
This course is designed to allow you to begin to communicate your own vision and artistic voice. This course is intended to take your technical skills to the next level, by reading, writing and thinking about photography. Pre-requisite: ARS 281 Minimum Grade of D.

ARS 382 Intermediate Photography II 3 cr
The three main objectives of this course is to further your knowledge of the fine art photography, learn how to conceptualize ideas through the medium of photography, and to treat photography primarily as a creative medium for discussing personal, political, and social concerns. Since photography is tied to many technical processes, these concerns will also be acknowledged in this class. Pre-requisite: ARS 281 Minimum Grade of C and ARS 381 Minimum Grade of C.

ARS 387 Digital Silver Photography 3 cr
This studio course examines the intersecting theories and practices of photography with digital cameras and computer imaging. Pre-requisite: ARS 382 Minimum Grade of D.

ARS 396 Professional Practices - W 3 cr
This course prepares students for employment, graduate school, or a professional career in the visual arts. Restricted to majors. Fee. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

ARS 400 Topics in Animation 3 cr
ARS 404 Studies in Animation 3 cr
Independent work in an approved Animation topic under the direction of a studio faculty member. This course may be repeated for a maximum of 6 credit hours. Fee. Pre-requisite: ARS 201 Minimum Grade of D and ARS 301 Minimum Grade of D.

ARS 408 Pre-Thesis in Animation - W 3 cr
This course focuses on the creation of pre-production materials, concept art, storyboards, animatics, as well as research design documents and supplements, to be used in ARS 409 Senior Thesis in Animation course. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (ARS 301 Minimum Grade of C or ARS 302 Minimum Grade of C).

ARS 409 Senior Thesis in Animation 3 TO 6 cr
An Independent project of creative work in the area of Animation with the guidance of one to three faculty advisors. The student is required to work at least 9 hours a week in the studio. The thesis must be publicly exhibited. This course should be taken twice in consecutive semesters for a total of 6 credit hours. Pre-requisite: ARS 404 Minimum Grade of C.

ARS 410 Topics in Glass 3 cr
ARS 411 Advanced Kiln Formed Glass 3 cr
Advanced kiln forming requires investigation into conceptual and technical problems in glass. The student becomes increasingly self-directed through further exploration of fusing, slumping, of casting. The development of firing schedules is emphasized. Fee. Pre-requisite: ARS 311 Minimum Grade of D and ARS 123 Minimum Grade of D. ARS 123 can be taken concurrently with this course.
ARS 412  Advanced Glassblowing  3 cr
Advanced techniques in hot glass will be explored for the
development of refined sculpture and/or craft in glass.
Course assignments will emphasize personal creativity
and exploration. Instruction includes advanced finishing
techniques and cold working techniques. A minimum of
3 additional weekly lab hours outside of class time are
required. Fee.
Pre-requisite: ARS 312 Minimum Grade of D and ARS 121
Minimum Grade of D. ARS 121 can be taken concurrently
with this course.

ARS 414  Studies in Glass  3 cr
Independent work in an approved Glass topic under the
direction of a studio faculty member. This course may be
repeated for a maximum of 6 credit hours. Fee.

ARS 422  Figure Drawing III  3 cr
Individual problems with the human figure as subject,
emphasizing concept, composition, and media.
Pre-requisite: ARS 322 Minimum Grade of D. ARS 322 can
be taken concurrently with this course.

ARS 425  Conceptual Drawing III  3 cr
A continuation of ARS 325 with emphasis on exploration of
personal concepts.
Pre-requisite: ARS 325 Minimum Grade of D. ARS 325 can
be taken concurrently with this course.

ARS 430  Topics in Painting  3 cr
An upper level Painting course treating a special subject or
theme as announced. This course may be repeated when
the topic varies for a maximum of 6 credit hours. Fee.

ARS 431  Painting IV  3 TO 6 cr
This class is a continuation of ARS 331 with emphasis
on personal development of conceptual approaches in oil
paint and/or water media paintings. Students with Primary
Concentrations in Painting will use this course to prepare
for thesis. This course may be repeated for a total of 6
semester hours credit.
Pre-requisite: ARS 331 Minimum Grade of D or ARS 332
Minimum Grade of D. ARS 331 can be taken concurrently
with this course.

ARS 434  Studies in Painting  3 cr
Independent work in an approved Painting topic under the
direction of a studio faculty member. This course may be
repeated for a maximum of 6 credit hours. Fee.

ARS 439  Senior Thesis in Painting  6 cr
An Independent project of creative work in the area of
Painting with the guidance of one to three faculty advisors.
The student is required to work at least 18 hours a week
in the studio. The thesis must be publicly exhibited. This
course may be repeated once for credit.

ARS 440  Topics in Ceramics  3 cr
An upper level Ceramics course treating a special subject or
theme as announced. This course may be repeated when
the topic varies for a maximum of 6 credit hours. Fee.

ARS 441  Advanced Ceramics  3 TO 12 cr
A continuation of ARS 341 with emphasis on hand building
or wheel processes. May be repeated for a total of 12
semester hours credit.
Pre-requisite: ARS 341 Minimum Grade of D or ARS 342
Minimum Grade of D. ARS 341 can be taken concurrently
with this course.

ARS 450  Topics in Printmaking  3 cr

ARS 451  Advanced Printmaking  3 TO 6 cr
A continuation of ARS 351 with emphasis on each student's
developing and refining an individual approach to creative
work. For students with a Primary Concentration in
Printmaking, this course is preparation for Thesis. Fee.
Pre-requisite: ARS 351 Minimum Grade of D. ARS 351 can
be taken concurrently with this course.

ARS 454  Studies in Printmaking  3 cr
Independent work in an approved Printmaking topic under
the direction of a studio faculty member. This course may be
repeated for a maximum of 6 credit hours. Fee.

ARS 459  Senior Thesis in Printmaking  6 cr
An Independent project of creative work in the area of
Printmaking with the guidance of one to three faculty
advisors. The student is required to work at least 18 hours
in the studio. The thesis must be publicly exhibited.
This course may be repeated once for credit.

ARS 460  Topics in Sculpture  3 cr
An upper level Sculpture course treating a special subject or
theme as announced. This course may be repeated when
the topic varies for a maximum of 6 credit hours. Fee.

ARS 461  Sculpture V  3 TO 6 cr
Experimental work with synthetic materials. This course may
be repeated for a total of 6 semester hours credit. Requires
permission of instructor.
Pre-requisite: ARS 362 Minimum Grade of D. ARS 362 can
be taken concurrently with this course.

ARS 464  Studies in Sculpture  3 cr
Independent work in an approved Sculpture topic under the
direction of a studio faculty member. This course may be
repeated for a maximum of 6 credit hours. Fee.

ARS 469  Senior Thesis in Sculpture  6 cr
An independent project of creative work in the area of
Sculpture with the guidance of one to three faculty advisors.
The student is required to work at least 18 hours a week
in the studio. The thesis must be publicly exhibited. This
course may be repeated once for credit.

ARS 470  Topics in Graphic Design  3 cr
An upper level Graphic Design course treating a special
subject or theme as announced. This course may be
repeated when the topic varies for a maximum of 6 credit
hours. Fee.
ARS 472  Senior Graphic Design  3 cr
An advanced workshop that addresses issues of visual
communication using graphic design as a problem-solving
tool. Fee.
Pre-requisite: ARS 373 Minimum Grade of C and ARS 374
Minimum Grade of C.

ARS 473  Web Design  3 cr
An introduction to interactive applications. This course
provides instruction in innovative, artistic design and
development of visual communication skills related to
interactive applications.
Pre-requisite: ARS 373 Minimum Grade of C.

ARS 474  Studies in Graphic Design  3 cr
Independent work in an approved Graphic Design topic
under the direction of a studio faculty member. This course
may be repeated for a maximum of 6 credit hours. Fee.

ARS 479  Design Business Practices-W  3 cr
A study of the business principles of Graphic Design.
Projects encourage both collaborative and independent
study. Students explore design as a commercial art and
develop the skills to coordinate projects through all phases
of a professional, business relationship. Fee.
Pre-requisite: ARS 373 Minimum Grade of C and ARS 374
Minimum Grade of C and (EH 102 Minimum Grade of C or
EH 105 Minimum Grade of C).

ARS 480  Topics in Photography  3 cr
An upper level Photography course treating a special
subject or theme as announced. This course may be
repeated when the topic varies for a maximum of 6 credit
hours. Fee.

ARS 481  Advanced Photography  3 cr
This course will strive to help further develop each student's
artistic strength in their use of the photographic medium.
Each student will be required to write a statement explaining
the body of work that they will create and what particular
processes they might be interested in exploring.
Pre-requisite: ARS 281 Minimum Grade of C and ARS 381
Minimum Grade of C and ARS 382 Minimum Grade of C.

ARS 483  Color Photography  3 cr
This is an introduction to color photography. The goals are
to become familiar with all aspects of color photography
including film selection, processing, printing, theory, and
criticism.
Pre-requisite: ARS 281 Minimum Grade of D and ARS 381
Minimum Grade of D and ARS 382 Minimum Grade of D.

ARS 484  Studies in Photography  3 cr
Independent work in an approved Photography topic under
the direction of a studio faculty member. This course may be
repeated for a maximum of 6 credit hours. Fee.

ARS 485  Alternative Photo Processes  3 cr
This is an advanced studio art course designed for students
with a background in photography (primarily black and
white) who want to expand their image making vocabulary
through the use of early photographic techniques.
Pre-requisite: ARS 481 Minimum Grade of D.

ARS 487  Photo Bookmaking  3 cr
This class will focus on the design and construction of artist
books. We will explore structure and form and how they
support and influence the content of a book.
Pre-requisite: ARS 481 Minimum Grade of D.

ARS 488  Graphic Design Thesis  3 cr
A self-directed creative project in the area of graphic design
with the guidance of a faculty member. Evaluation of the
project is by faculty committee. Fee.
Pre-requisite: ARS 472 Minimum Grade of C and ARS 479
Minimum Grade of C.

ARS 489  Senior Thesis in Photography  6 cr
An independent project of creative work in the area of
Photography with the guidance of one to three faculty
advisors. The student is required to work at least 18 hours
a week in the studio. The thesis must be publicly exhibited.
This course may be repeated once for credit.

ARS 490  Special Topics  1 TO 12 cr
An advanced studio, lecture, or seminar course treating
a special medium, subject, or theme, as announced. This
course may be repeated for a maximum of twelve (12)
credit hours. Requires junior standing and permission of the
instructor.

ARS 494  Directed Studies  3 TO 6 cr
Independent work in an approved studio medium or topic
under the direction of a studio faculty member. May be
repeated for a maximum of 6 credits.

ARS 496  Professional Studies Internship  3 cr
Students intern in a specialized area of interest. Written
report required.

ARS 497  Senior Thesis in Glass  6 cr
An independent project of creative work in the area of the
Glass Concentration, with the guidance of one to three
faculty advisors. The student is required to work at least
18 hours a week in the studio. The thesis must be publicly
exhibited. Fee.

ARS 498  Senior Thesis  6 cr
An independent project of creative work in the area of the
Primary Concentration or one or more Secondary
Concentrations, with the guidance of one to three faculty
advisors. The student is required to work at least 18 hours
a week in the studio. The thesis must be publicly exhibited.
This course may be repeated once for credit.
ARS 499 Honors Senior Thesis - H 3 cr
Honors student, the first semester, will identify and carry out independent scholarly research on a topic with the guidance of a faculty mentor. The second semester, students will produce a body of work that incorporates and exemplifies the ideas explored in the research paper. The project will be concluded with a formal presentation to the Visual Arts faculty. The Honors Project will be graded by a three-member faculty committee, chaired by the mentor. This course is to be taken as two, sequential, three-credit course units.
Pre-requisite: HON 301 Minimum Grade of D.

ARS 500 Graduate Animation 3 cr
Intensive course structured as an exploration of the practice and production of animation. May be repeated for a total of 36 credit hours.

ARS 504 Digital Modeling 3 cr
This course introduces the concepts and techniques used in the creation of three dimensional form in a digital space. Emphasis will be on the practical use and creation of three dimensional models for animation and texturing. The course will also explore how formal choices impact meaning, and discuss contemporary artists who incorporate digital modeling into their work. Fee.

ARS 510 Graduate Glass 3 cr
Intensive investigation of visual, expressive or technical problems in glass. May be repeated for a total of 18 credit hours. Pre-requisite: bachelor's degree in art or art education. Fee.
Pre-requisite: ARS 411 Minimum Grade of C and ARS 412 Minimum Grade of C.

ARS 520 Graduate Drawing 3 TO 9 cr
Intensive course in drawing as both a set of skills and as a creative medium of expression. May be repeated for a total of 36 credit hours. Pre-requisites: complete either appropriate pre-requisites or bachelor's degree in art or art education. Fee.
Pre-requisite: ARS 422 Minimum Grade of C or ARS 425 Minimum Grade of C. ARS 422 and ARS 425 can be taken concurrently with this course.

ARS 526 Graduate Color Theory 3 cr
A studio course continuing a study of the nature, theory and application of color in an aesthetic context.
Pre-requisite: ARS 326 Minimum Grade of C.

ARS 530 Graduate Painting 3 TO 9 cr
Intensive course in painting with traditional or contemporary media, subjects and concepts. May be repeated for a total of 36 credit hours. Pre-requisites: complete either appropriate pre-requisites or bachelor's degree in art or art education. Fee
Pre-requisite: ARS 431 Minimum Grade of C. ARS 431 can be taken concurrently with this course.

ARS 540 Graduate Ceramics 3 TO 9 cr
A study of clay as a creative medium of expression. Problems of form, volume, space, texture, decoration, and function will be investigated in their relation to selected ceramics processes and building techniques. May be repeated for a total of 36 semester hours. Pre-requisites: complete either appropriate pre-requisites or bachelor's degree in art or art education. Fee.
Pre-requisite: ARS 441 Minimum Grade of C. ARS 441 can be taken concurrently with this course.

ARS 550 Graduate Printmaking 3 TO 9 cr
Intensive investigation of visual, expressive or technical problems in one or more printmaking media. This course may be repeated for a total of 36 hours credit. Pre-requisites: complete either appropriate pre-requisites or bachelor's degree in art or art education. Fee.
Pre-requisite: ARS 451 Minimum Grade of C. ARS 451 can be taken concurrently with this course.

ARS 551 Photomechanical Technologies 3 cr
This course will provide students with an education in the materials, methods, history, contemporary technologies of photomechanical processes. Students will gain a knowledge of photographic print processes and issues through the development of a body of original work. Through critiques students will be expected to develop a familiarity with techniques and materials. Concurrent enrollment in ARS 591. Lab fee.

ARS 552 Artist Book Seminar 3 cr
This course will provide students with an education in the materials, methods, and contemporary strategies for artist books. Students will gain knowledge of several artist book strategies and forms through the development of a body of original work. Through critiques students will be expected to develop a familiarity with techniques and materials. Concurrent enrollment in ARS 591. Lab fee.

ARS 560 Graduate Sculpture 3 TO 9 cr
Intensive investigation of problem of mass, volume, form, and space using one or more sculptural media. This course may be repeated for a total of 36 hours credit. Pre-requisites: complete either appropriate pre-requisites or bachelor's degree in art or art education. Fee.
Pre-requisite: ARS 461 Minimum Grade of C. ARS 461 can be taken concurrently with this course.

ARS 570 Graduate Graphic Design 3 cr
An intensive workshop that investigates advanced issues of visual communication using graphic design as both a problem-solving tool and as a medium for creative expression and communication. Emphasis on trending technology and/or professional practice. May be repeated for a total of 36 credit hours. Pre-requisite: ARS 488 Minimum Grade of B.
ARS 571  Advanced Typography and Layout  3 TO  6 cr
Intensive workshop that investigates and explores advanced typography and layout and/or format techniques both in digital and analog forms. Issues of visual communication using graphic design as both a problem-solving tool and a medium for creative expression and communication will also be investigated and explored. Emphasis on trending technology, research methods, and professional practice. May be repeated for a total of 6 credits hours. Pre-requisite: ARS 488 Minimum Grade of B.

ARS 572  Divergent Thinking Research  3 TO  6 cr
Introduction to the fundamental and varied methodologies of research, theories of design and human behavior, and discipline-related history in order to work with a variety of design products and users. Emphasis will be placed on application of research findings to the creative process, design, and visual solutions. May be repeated for a total of 6 credit hours. Pre-requisite: ARS 488 Minimum Grade of B.

ARS 576  Build Your Social Media Brand  3 TO  6 cr
An intensive workshop that investigates advanced uses and techniques for growing an audience through social media and online content marketing using visual communication, graphic design, and copy writing techniques. Emphasis on trending technology and/or professional practice as a medium for creative expression and communication. This graduate course focuses on growing an audience online with an emphasis on personal branding, social media branding and marketing, and content marketing on your website and social media channels. May be repeated for a total of 6 credit hours. Pre-requisite: ARS 488 Minimum Grade of B.

ARS 580  Graduate Photography  3 cr
Emphasizing theory, concept, and critical thinking, while expanding knowledge of the photographic medium. May be repeated for a total of 18 credit hours. Prerequisite: ARS 387 Minimum Grade of D or ARS 481 Minimum Grade of a D or bachelor's degree in art or education. Fee. Pre-requisite: ARS 387 Minimum Grade of C or ARS 481 Minimum Grade of C.

ARS 590  Special Topics -  3 TO  9 cr
A graduate course treating a special medium, subject, or theme, as announced. This course may be repeated twice when the content varies, for a maximum of 9 credit hours.

ARS 591  Graduate Seminar  3 cr
A detailed examination of selected topics in art. Topics announced prior to registration. This course includes scholarly research, writing, and creative work. May be repeated up to five times for a total of 18 credit hours when course content changes. Prerequisite: Graduate standing in the Visual Art Department.

ARS 592  Graduate Thesis  1 TO  3 cr
An independent project of creative work, with the guidance of a faculty committee. The thesis must be an original project/production and have a visual component. May be repeated for a total of 6 credit hours. Prerequisite: Must have completed or be concurrently enrolled in 9 hours of graduate courses.

Audiology (AUD)

AUD 681L  Clinical Practicum I-Lab  1 TO  3 cr
Students will obtain experience administering audiologic assessments and intervention techniques with clinical populations in the USA Speech and Hearing Center or in off-campus clinical practicum sites under direct supervision. Co-requisite: AUD 681

AUD 682L  Clinical Practicum II-Lab  1 TO  3 cr
Students will obtain experience administering audiologic assessments and intervention techniques with clinical populations in the USA Speech and Hearing Center or in off-campus clinical practicum sites under direct supervision. Co-requisite: AUD 682

AUD 683L  Clinical Practicum III-Lab  1 TO  3 cr
Students will obtain experience administering audiologic assessments and intervention techniques with clinical populations in the USA Speech and Hearing Center or in off-campus clinical practicum sites under direct supervision. Co-requisite: AUD 683

AUD 612  Anatomy-Physio Hearing Mech  4 cr
Study of the anatomy and physiology of the nervous system, the anatomy and physiology of the outer, middle, inner ear, including the vestibular system, and the central auditory nervous system.

AUD 613  Psychoacoustics  3 cr
Study of the principles, procedures and research involved in the field of psychoacoustics and of the relationships between the physical dimensions of auditory stimuli and the resultant perceptual experience as well as the relationships among psychoacoustic testing and both auditory physiology and the audiologic evaluation process. Participation in laboratory assignments will be required.

AUD 614  Instrumentation and Acoustics  3 cr
Study of basic electricity, acoustics and measurement of sound properties, wave analysis, transducers, measuring and calibration systems, speech processing systems, and system interaction and integration.
AUD 616  Resrch Design Hearing Sci  3 cr
Research designs utilized in the hearing sciences; elements of research proposals and studies; how to critique a research study; how to conduct a literature review; APA format; students will be required to write precis of research articles and write a research proposal. Elements of modern statistics including sets and functions, probability theory, hypothesis testing, analysis of variance models, correlation, and regression.

AUD 621  Professional Issues  3 cr
This course will address a variety of professional issues such as organizations, societies, and their histories; codes of ethics; scopes of practice; credentialing and licensure; the development of the AUD; guidelines and position statements generated by ASHA and AAA; standards and best practices; methods and models of service delivery; and audiology practice management.

AUD 622  Medical Audiology  4 cr
This course will address acquired and congenital diseases and disorders of the outer, middle, and inner ear and the central auditory nervous system occurring across the lifespan; imaging techniques; non-audiologic medical and surgical interventions for these conditions; and cerumen management techniques; and appropriate methods for monitoring of patients prescribed potentially ototoxic medications.

AUD 623  Pharma & Ototox Monitoring  3 cr
This course will provide the basic science background necessary to understand the effects of medications on the auditory and balance systems. This course will also address drug treatment strategies for hearing loss and balance disorders. Topics will include mechanisms of drug actions, side effects, how age and disease affect these mechanisms, and specific effects of certain drugs on the hearing and balance system. This course will additionally address appropriate methods for identification and monitoring of patients prescribed potentially ototoxic medications.

AUD 630  Electroac Char of Amp Systems  3 cr
This course will address styles and types of earmolds, hearing aids, and assistive listening devices; components common to all amplification systems as well as optional features (such as directional microphones, volume controls, telecoils, etc.) and their electroacoustic properties and functioning; use of ANSI standards; physical, acoustic and electroacoustic modifications of earmolds and amplification systems.

AUD 631  Sel, Fit & Verif of Amp Sys  3 cr
This course will address the principles of selection, fitting, and verification of amplification systems, including hearing aids and assistive listening devices; subjective and objective audioligic assessments used to determine need for, select, and fit appropriate amplification systems for patients of all ages; and techniques used to select and fit amplification systems. The course will also address subjective and objective verification procedures, specifically addressing the importance of including Real-Ear Measures and subjective self-assessment measures in the amplification process.

AUD 632  Hearing Aid Lab  1 cr
This course will address the principles of verification and validation; tools used to verify appropriate fitting of amplification systems (such as real-ear probe-mic equipment) and techniques used to validate fitting (such as software packages, and subjective and objective audioligic measures); cochlear implant remapping.

AUD 633  Advanced Sensory Aids  3 cr
This course will address advanced technologies for individuals with hearing-impairment such as cochlear and brainstem implants, vibrotactile aids, and implantable devices, as well as the selection and fitting of these technologies.

AUD 640  Basic Audiologic Assessment  3 cr
This course will address the principles of cross-check, the test battery approach, differential diagnosis, relevant test equipment, instruments, and transducers, administration and interpretation of the pure-tone testing, clinical masking, case history, otoscopy, and tuning-fork tests, speech audiometry; tests for pseudo-hypoacusis, ototoxicity, site-of-lesion testing and historical assessments; and informal assessment procedures.

AUD 641  Immit & Otoacous Emission Meas  3 cr
This course will address administration and interpretation of acoustic immittance and otoacoustic emission measures across the lifespan. Topics will address standard and multi-frequency tympanometry, acoustic reflex testing, and eustachian tube function testing; spontaneous, transient and distortion-product OAE measurement; and the influence of intrinsic and extrinsic variables, including cochlear and retro-cochlear pathology, on outcomes and differential diagnosis.

AUD 642  Pediatric Audiology  3 cr
This course will address issues associated with providing audioligic services to pediatric and developmentally delayed populations. Issues will include gestational development, test administration and interpretation; genetic transmission of hearing loss, risk factors for hearing loss; principles of screening and the development and construction of a screening program; universal newborn hearing screening and early hearing detection and intervention programs.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AUD 643</td>
<td>Audiology and Aging</td>
<td>3 cr</td>
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<td>This course will address the issues associated with</td>
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<td></td>
<td>providing audiological services to older adults. Issues</td>
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<td>will include effects of aging on anatomy, physiology,</td>
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<td>and function, and test administration and interpretation</td>
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<td>issues specific to older adults.</td>
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<tr>
<td>AUD 645</td>
<td>Evoked Potential Measures</td>
<td>3 cr</td>
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<td>This course will address instrumentation (transducers and</td>
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<td>electrode types); application and interpretation of evoked</td>
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<td>potential (EP) measures including ENOG, ECochG, ABR,</td>
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<td>middle and late potentials, across the lifespan;</td>
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<td>sedation protocols; assessment protocols associated with</td>
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<td>different EP measures and the populations to which they</td>
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<td>are applied; population norms; intrinsic and extrinsic</td>
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<td>variables affecting EP results; differential diagnosis of</td>
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<td>auditory neuropathy; troubleshooting.</td>
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<td>AUD 647</td>
<td>Adult Audio Rehabilitation</td>
<td>3 cr</td>
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<td>This course will address the implications of hearing loss</td>
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<td>in adulthood including the educational, vocational, social</td>
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<td>and legislative concerns of adults with hearing loss;</td>
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<td>assessment tools and intervention techniques used to</td>
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<td>maximize communication skills, including communication</td>
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<td>strategy training, speechreading, and group therapy</td>
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<td>approaches.</td>
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<tr>
<td>AUD 648</td>
<td>Counseling Hear Imp-Families</td>
<td>3 cr</td>
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<td>This course will address various theories, principles and</td>
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<td></td>
<td>techniques associated with the social and psychological</td>
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<td>aspects of disability as well as issues specific to and</td>
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<td>techniques used when counseling patients with hearing loss</td>
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<td>and their families.</td>
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<tr>
<td>AUD 649</td>
<td>Ped Habil &amp; Educ Audiology</td>
<td>3 cr</td>
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<td></td>
<td>This course will address the speech, language, and</td>
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<td></td>
<td>communication of children with hearing impairment. Manual</td>
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<td>and oral modes of communication will be discussed,</td>
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<td>including American Sign Language, Signing Essential</td>
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<td>English I and II, Cued Speech, Total Communication, and</td>
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<td>Auditory-Verbal Therapy. Other issues to be addressed</td>
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<td></td>
<td>will include the development, management, and utilization</td>
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<td></td>
<td>of hearing and middle ear system screening programs,</td>
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<td></td>
<td>classroom acoustics, selection and fitting of classroom-</td>
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<td></td>
<td>based amplification, and federal law associated with</td>
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<td></td>
<td>children with special needs. Taught Spring Semester.</td>
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<tr>
<td>AUD 651</td>
<td>Assess-Treatmnt Cent Aud Proc</td>
<td>3 cr</td>
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<td>This course will address the development, assessment, and</td>
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<td></td>
<td>interpretation of an auditory processing test battery</td>
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<td>across the lifespan, as well as intervention approaches.</td>
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<tr>
<td>AUD 653</td>
<td>Industrial-Forensic Audiology</td>
<td>3 cr</td>
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<td>This course will address federal noise standards, effects</td>
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<td>of noise exposure on the auditory system, sound</td>
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<td>measurement and instrumentation, development and</td>
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<td></td>
<td>implementation of a hearing conservation program,</td>
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<td>hearing protection devices and forensic audiology.</td>
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<td>AUD 654</td>
<td>Tinnitus and Hyperacusis</td>
<td>3 cr</td>
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<td></td>
<td>This course will address assessment and intervention</td>
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<td></td>
<td>approaches used in the management of tinnitus and</td>
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<td>hyperacusis.</td>
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<td>AUD 655</td>
<td>Spch-Lang Path for Audiologist</td>
<td>3 cr</td>
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<td></td>
<td>This interprofessional education (IPE) course will address</td>
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<td></td>
<td>the foundational knowledge and skills necessary for</td>
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<td>audiologists to work together with speech-language</td>
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<td>pathologists in interprofessional collaborative teams.</td>
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<td>Specifically, this course will address the scope of</td>
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<td>practice in audiology, speech-language screening,</td>
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<td>speech-language report literacy and special topics.</td>
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<td>AUD 656</td>
<td>Vestibular Assessment</td>
<td>4 cr</td>
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<td>This course will include a discussion of the peripheral</td>
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<td>and central anatomy and physiology of the balance system</td>
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<td>and the test measures used to assess the function of this</td>
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<td>complex system. Topics will include case history and</td>
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<td>screening measures, as well as test protocols and analysis</td>
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<td>of results on electronystagmography/ videonystagmography,</td>
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<td>rotational testing, posturography, and vestibular evoked</td>
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<td>myogenic potentials. Taught Spring Semester.</td>
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<td>AUD 657</td>
<td>Management of Vestibular Disor</td>
<td>2 cr</td>
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<td>This course will focus on peripheral and central disorders</td>
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<td>of the vestibular system and the interpretation of results</td>
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<td>on diagnostic tests in disordered patients. Pharmacological</td>
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<td></td>
<td>and surgical treatments of dizziness will be discussed,</td>
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<td>as well as rehabilitative techniques to manage the</td>
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<td></td>
<td>vestibular pathology.</td>
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<tr>
<td>AUD 658</td>
<td>Advanced Neurophys Measures</td>
<td>3 cr</td>
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<td>This course will address advanced electrophysiological</td>
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<td>techniques, including ENOG, ALR, ERPs (i.e. P300, etc),</td>
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<td>and neuroimaging techniques (fMRI and PET) with an</td>
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<td>emphasis on auditory and cognitive processing, across the</td>
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<td>lifespan; source localization techniques; instrumentation;</td>
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<td>stimulus and acquisition parameters; measurement</td>
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<td>procedures; analysis and interpretation.</td>
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<tr>
<td>AUD 661</td>
<td>Developmnt-Managemnt Aud Prac</td>
<td>3 cr</td>
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<td></td>
<td>This course will address issues associated with audiology</td>
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<td>practice management including techniques involved in</td>
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<td>developing a mission statement and a business plan;</td>
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<td>working with an accountant; determining type, location,</td>
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<td>and name of practice; regulation, licensure, and hiring a</td>
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<td>legal advisor; equipment and service delivery decisions;</td>
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<td>establishing accounts with suppliers, paying bills and</td>
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<td>budgeting; third-party reimbursement, Medicaid, and</td>
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<td>Medicare; hiring and supervision; demographics and</td>
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<td>marketing; use of outcome data; and professional writing.</td>
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<tr>
<td>AUD 674</td>
<td>Special Projects in Audiology</td>
<td>3 cr</td>
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<td>Student will be required to develop a variety of projects</td>
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<td>during their academic training, some of which will be</td>
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<td>further developed and completed during this course.</td>
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</table>
AUD 675  Special Topics in Audiology  1 cr
Student will identify cases or service delivery issues of
clinical or professional interest and present these cases or
issues to fellow students, clinical supervisors, and faculty via
chat room in a grand rounds format.

AUD 680  Clinical Methods in Audiology  1 TO 3 cr
Students will become familiar with and conduct basic
audiologic procedures with non-clinical populations by
completing various lab assignments. Students will also
observe clinical activities in the USA Speech & Hearing
Center.

AUD 681  Clinical Practicum I  1 TO 3 cr
Discussion of instrumentation, procedures, and approaches
to assessment and intervention in audiology.
Co-requisite: AUD 681L

AUD 682  Clinical Practicum II  1 TO 3 cr
Discussion of instrumentation, procedures, and approaches
to assessment and intervention in audiology.
Co-requisite: AUD 682L

AUD 683  Clinical Practicum III  1 TO 3 cr
Discussion of instrumentation, procedures, and approaches
to assessment and intervention in audiology.
Co-requisite: AUD 683L

AUD 684  Clin Externship in Audiology  1 TO 12 cr
Off-campus opportunity to obtain clinical experience in
a full-time setting. In addition, student may be required
to identify cases or service delivery issues of clinical or
professional interest and present these cases or issues
to fellow students, clinical supervisors, and faculty via an
online forum in a grand rounds format.

AUD 699  Thesis  1 TO 3 cr
Under the advice and guidance of a faculty member,
students will identify and complete a research project
relevant to the field of Audiology. Requires approval of the
Department Chair.

Biochemistry - MD (BCH)

BCH 400  Biochemistry Externship  1 TO 4 cr
To be determined.

BCH 410  Research in Biochem & Mol Biol  1 TO 4 cr
: To carry out research under the supervision of a
sponsoring faculty member. The student will help design
experiments, learn and apply established techniques, record
and evaluate data and make a final report both written and
oral that describes the overall experimental results. The
faculty member will assist the student in the project. This
rotation is highly recommended for the student considering
a career in academic medicine. Research areas include
the biochemistry and molecular biology of cancer, lung
diseases, and RNA viruses.

BCH 526  Biochemistry Lit Reports  1 cr
Students and faculty participate in a supervised reading of
current literature and meet once a week to interact in a
discussion of the selected article. The goal of this course
is to maintain the student's level of information at a "state
of the art" in both methods and theory in the discipline and
to develop critical skills in reviewing the literature. Student
presentation is required to receive credit.

BCH 527  Dir Studies Biochemistry  1 TO 6 cr
Students participate in research under the direction of a
graduate faculty member. The student may pursue
independent research or participate in a literature project.
This course should be taken by students who have
completed their laboratory rotations, but have not yet
submitted a research proposal.

BCH 590  Sp Top -  1 TO 3 cr
This course provides in-depth tutorial exposure to specific
areas in the discipline. Student and/or faculty presentations
followed by group discussions (usually in the Socratic
mode), examine the subject matter in an area of current
interest either to one student or to a group of students.
Credit and title are arranged with an individual faculty
member.

BCH 622  Molecular Biology  3 cr
The focus of this course is on cellular processes involving
DNA repair, replication and translation. Current concepts
regarding the organization and structure of chromosomes,
genomes and the regulation of gene expression will be
discussed. Eukaryotic molecular biology is emphasized,
however some eukaryotic and prokaryotic processes
are compared and contrasted. This course stresses the
methods and experimental design used to delineate and
understand cellular information transfer and molecular
phenomena.

BCH 626  Biochemistry Research Seminar  1 cr
Students and faculty present a research topic for discussion
before members of the department. The presentations are
usually scheduled on a rotational basis. The student may
present research data for critique by the faculty.

BCH 799  Research-Dissertation  1 TO 6 cr
Independent research by the student under the sponsorship
of the graduate faculty. Students are required to submit a
research project description form before enrolling in this
course. Progress reports of the work accomplished are
required every six months.
Biology (BLY)

BLY 101L  Life Science I Laboratory  1 cr
Laboratory exercises associated with BLY 101. Together, BLY 101 and BLY 101L count as one laboratory science course, partially fulfilling general education requirements. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Pre-requisite: BLY 101 Minimum Grade of D. BLY 101 can be taken concurrently with this course.

BLY 102L  Life Science II Lab  1 cr
Laboratory exercises associated with BLY 102. Together, BLY 102 and 102L count as one laboratory science course, partially fulfilling general education requirements. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Fee.
Pre-requisite: BLY 101 Minimum Grade of D and BLY 102 Minimum Grade of D. BLY 101 and BLY 102 can be taken concurrently with this course.

BLY 121L  General Biology I Lab  1 cr
Laboratory exercises associated with BLY 121. Together, BLY 121 and BLY 121L count as one laboratory science course, partially fulfilling general education requirements. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Fee.
Pre-requisite: BLY 101 Minimum Grade of D and BLY 102 Minimum Grade of D. BLY 101 and BLY 102 can be taken concurrently with this course.

BLY 122L  General Biology II Laboratory  1 cr
Laboratory exercises associated with BLY 122. Together, BLY 122 and 122L count as one laboratory science course, partially fulfilling general education requirements. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Fee.
Pre-requisite: BLY 121 Minimum Grade of D.

BLY 134L  Ocean Science Lab  1 cr
Lab experiences associated with BLY 134.
Pre-requisite: BLY 134 Minimum Grade of D. BLY 134 can be taken concurrently with this course.

BLY 101  Life Science I  3 cr
The first of a two-semester sequence designed for the non-major. The basic principles of biological phenomena are emphasized by examples relating to the human. Cell structure and function, energy and organ systems are studied. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).

BLY 102  Life Science II  3 cr
A continuation of BLY 101. Organ systems, cell reproduction, plant and animal development, heredity, evolution, and ecology area studied. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Pre-requisite: BLY 101 Minimum Grade of D. BLY 101 can be taken concurrently with this course.

BLY 121  General Biology I  3 cr
A study of general biological principles, including the chemical basis of life; cellular biology, including cell structure and metabolism, genetics, microevolution; and a survey of simple organisms, including bacteria, protists and fungi.Core Course. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Co-requisite: BLY 121L
Pre-requisite: ACT Math 22 or CH 100 Minimum Grade of D or CH 131 Minimum Grade of D or BLY 101 Minimum Grade of C or MA 112 Minimum Grade of D.

BLY 122  General Biology II  3 cr
A study of plants, major invertebrate phyla, vertebrate morphology, plant and animal physiology, animal behavior, macroevolution and ecology. Core course. Credit will not be allowed for both the non-major sequence (BLY 101, BLY 101L and BLY 102 BLY 102L) and the major/minor sequence (BLY 121, BLY 121L and BLY 122, BLY 122L).
Co-requisite: BLY 122L
Pre-requisite: BLY 121 Minimum Grade of D.

BLY 134  Ocean Science  3 cr
An introduction to physical, chemical, and biological oceanography.
BLY 205  Intro Environmental Sci  3 cr
Environmental science, including the fundamentals required to understand how ecosystems work, how environmental modifications affect ecosystems and living things, and how living things affect their environment. Topics to be emphasized include the effects of pollution, habitat modification and other environmental changes, on ecosystems, plants, wildlife, man, outdoor recreation and the future. Public health and medical effects will also be considered. Many topics covered are of special significance to this region: wetlands, the effects of dredging and filling, artificial lake construction, development, agricultural and forestry practices on ecosystems, plants and animals. Requires college biology, or permission of instructor. Pre-requisite: BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C. BLY 121 can be taken concurrently with this course.

BLY 207  Biology of Aging  3 cr
A descriptive review of processes of aging. Emphasis is placed on studying structural and functional changes that could occur with increase in chronological age. Usually taught in the fall, spring and summer terms. Pre-requisite: BLY 101 Minimum Grade of D.

BLY 213  Microbiology  3 cr
A survey of bacteria, fungi, protozoa and viruses with emphasis on host-microbe interactions, immune responses, and control mechanisms. Pre-requisite: BLY 101 Minimum Grade of D or BLY 121 Minimum Grade of D.

BLY 214  Lab Studies Microbiology  1 cr
A series of laboratory experiments designed to provide practical experiments in basic microbial techniques. Pre-requisite: (BLY 213 Minimum Grade of D or BMD 210 Minimum Grade of D). BLY 213 can be taken concurrently with this course.

BLY 301  Cell Biology  3 cr
A course designed to integrate cell structure and function: the study of the ultrastructure, organization, physiology, genetics, and other functions of the cell. Core course. Pre-requisite: BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C and CH 131 Minimum Grade of C.

BLY 302  Genetics  3 cr
An introduction to both classical and modern genetic concepts and theory, with an emphasis on problem-solving. Topics covered include Mendelian genetics, molecular genetics, and evolutionary genetics. Core course. Pre-requisite: BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C and CH 131 Minimum Grade of C.

BLY 303  Ecology and Evolution  3 cr
Introduction to the fundamental concepts of ecology and evolution, with emphasis on their status as interrelated, central organizing principles of biology. Major topics will include community structure, biotic and abiotic interactions, mechanisms of evolution, adaption, and phylogenetics. Theoretical and practical issues will be addressed. Core course. Pre-requisite: BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C and CH 131 Minimum Grade of C.

BLY 304  Exp. Designs in Biology  3 cr
Experimental designs in Biology is intended to provide students with basic skills of experimental design and statistical methodology needed in modern biological research. Additionally, students will learn basic statistical software (e.g., Minitab, Ecosim, Resampling Procedures). The use of statistical software will be fully integrated with lecture material to provide a 'holistic' learning experience. Having completed this course, students will have gained a basic foundation in quantitative procedures for analyzing and interpreting biological data. This course requires each student to have a lap-top computer and a copy of Minitab Student v 14, which is provided with the required text. Pre-requisite: BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C and MA 112 Minimum Grade of C.

BLY 310  Economic Botany  3 cr
This course includes the study of plants in their form and structure by connecting them to their use by humans. Topics include plant anatomy and nomenclature; history of plant use; origins of economically important plants; use of flowers, fruits, stems and leaves for food and other purposes. Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 314  Molecular Microbiology - W  4 cr
Study of procaryotic and eucaryotic microorganisms and their relationship to their environment. Molecular, genetic and biochemical aspects of each will be emphasized. Pre-requisite: EH 102 Minimum Grade of C and CH 131 Minimum Grade of C and BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 321  Genetics of Development  3 cr
An in-depth laboratory experience to determine the genetic regulation involved in organ development using the C. elegans model system. The research experience gained in this laboratory class is designed to generate novel results ultimately be shared with the larger scientific community. Emphasis will be place on mastering experimental design and data analysis. Students will work together in laboratory groups to carry out experiments, to discuss progress and conclusions, and review the primary literature relating to the project. Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.
BLY 332  Biology of Algae  4 cr
A survey of non-vascular plants: algae, fungi, liverworts, and mosses, with emphasis on morphology and taxonomy.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 342  Experimental Cell Biology-W  2 cr
Laboratory experience with instrumentation and techniques utilized in modern cell biology research including organellar isolation, enzyme assay, protein analysis, and microscope techniques. Students develop and conduct group projects.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 350  Human Physiology  3 cr
The function and regulation of the organ systems of the body and physiological integration of the systems to maintain homeostasis. Course content will include neural and hormonal homeostatic control mechanisms, and study of the musculoskeletal, circulatory, respiratory, digestive, urinary, immune, reproductive, and endocrine systems.
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C) and CH 115 Minimum Grade of D or CH 131 Minimum Grade of D and (BLY 301 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of C or BLY 122L Minimum Grade of C) and BLY 121L Minimum Grade of C or BLY 142 Minimum Grade of C and BLY 122L Minimum Grade of C and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 352  Biol Terrestrial Verts - W  4 cr
Evolution, characteristics, classification, life history, ecology, and behavior of amphibians, reptiles, birds, and mammals. Laboratory and field work emphasize local species.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 354  General Entomology  4 cr
Classification and habits of insects, including collection, preservation, and identification of those occurring in south Alabama.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 360  Invertebrate Zoology  4 cr
Detailed study of the invertebrate phyla, taxonomy, ecology and phylogenetic relationship. Terrestrial, fresh-water, and marine forms are studied.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 363  Vertebrate Embryology  4 cr
Avian and amphibian histogenesis and organogenesis from fertilization to time of histological maturity.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 367  Marine Biology  4 cr
A general survey of marine plants, invertebrates and vertebrates, the communities they form and the physical and chemical factors that influence them. Field trips include marsh, seagrass, and dune habitats. Sampling from research vessels and laboratory exercises will serve to introduce students to the diversity of marine habitats and organisms. Organisms will be identified using dichotomous keys. Participation in overnight field trips is a part of this course. Snorkeling gear is required.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C) and (CH 115 Minimum Grade of D or CH 131 Minimum Grade of D) and (CH 116 Minimum Grade of D or CH 132 Minimum Grade of D).

BLY 368  Dolphins and Whales  2 cr
Classification, anatomy, and ecology of cetaceans and manatees. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 369  Blgy/Conserv Marine Turtles  2 cr
Introductory course providing an overview of the biology and conservation of marine turtles. The course will culminate with a multi-day field trip to sea turtle nesting beaches and foraging grounds in the southeastern U.S. Class also will visit sea turtle research and rehabilitation facilities. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term. Special fees apply and will be posted on the website: www.disl.org
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).
**BLY 370  Marine Aquaculture  2 cr**  
Techniques and issues involved with the commercial culture of marine organisms including nutrition, reproductive biology, production, water quality, processing, marketing, and economics. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.  
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

**BLY 371  Shark and Ray Biology  2 cr**  
This course will provide an introduction to the biology of sharks and rays, with special emphasis on regional shark fauna and field techniques. Lectures will be supplemented with discussions of papers from the primary literature to familiarize students with current research; in addition, longline and gillnet sampling will provide students with first hand knowledge of field techniques and local shark identification. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.  
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) or (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

**BLY 372  Coastal Birds of Alabama  2 cr**  
An introductory-level, field-based course covering identification, population dynamics and behavior of coastal avian fauna. Field trips will be taken to local coastal ecosystems and island rookeries. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.  
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

**BLY 411  Developmental Biology  3 cr**  
A study of the principles that regulate the development of a complex, multicellular from a single cell with a focus on the underlying molecular mechanism and genetic regulation. Topics to be covered will include fertilization, differentiation, cell fate determination, pattern formation, organogenesis and regeneration. Particular emphasis will be placed on the experimental approaches, both historical and contemporary, that led to our current understanding of the development of multicellular organisms.  
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

**BLY 414  Expt Bacterial Genomics - W  4 cr**  
An integrated lab-lecture course utilizing real-world research experiences to explore the molecular genetics and genomics of bacteria. Students will be directly involved in the design, execution, analysis, and presentation of group research projects determining the function of genes from completed microbial genomes. A basic foundation in microbiology and genetics is required for this course.  
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C and BLY 314 Minimum Grade of C and EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.

**BLY 425  Chemical Ecology - W  3 cr**  
This class focuses on chemically mediated interactions between, among, and within organisms in both the aquatic and terrestrial environments. The topics covered include: chemoreception, chemical defense, chemical attraction, and the impact of chemical ecology on humans. This course includes a writing component. Students will gain experience in critical analysis, research development, grant writing, and computer-based presentation.  
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

**BLY 426  Freshwater Ecology  3 cr**  
This course examines four aspects of freshwater ecology; physical and chemical properties of water, biotic communities, links among freshwater systems, and human influence on freshwater ecosystems. Students will be required to submit a collection of local freshwater invertebrates.  
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).
BLY 430  Marine Botany  4 cr
A general survey of marine algae and vascular and nonvascular plants associated with the marine environment. Distribution, identification, structure, ecology, and reproduction will be considered. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 431  Plant Physiology - W  4 cr
An integrative study of higher plant functions. This course includes a study of water relations, plant biochemistry, plant development, and plant-environmental interactions.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C and CH 132 Minimum Grade of D.

BLY 432  Morphology Vascular Plants  4 cr
Morphological features and possible relationships of psilophytes, club mosses, horsetails, ferns, and seed plants. Illustrated whenever feasible with local plants.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 433  Evolution of Vascular Plants  4 cr
A survey of the systematics, taxonomy, and structure of the major groups of vascular plants. Fossil plants (paleobotany) will also be covered where relevant. Many labs are outdoors and focus on plant structure and identification utilizing the rich local flora.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 434  Plant Physiological Ecology  3 cr
Plant Physiological Ecology is an investigation into the relatively "new" scientific field of physiological ecology (i.e., the study of how plants function in their environment) and is designed to meet the needs of students majoring in biology, ecology and/or various disciplines in plant biology. This course explores plant biology, plant-animal interactions, as well as, principles of ecology and evolution. Category B.
Pre-requisite: BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C and BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C and BLY 325 Minimum Grade of C.

BLY 435  Biology of Fungi  4 cr
Identification and morphology of fungi with some emphasis on their relation to human affairs. Collection required.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 436  Animal Physiology - W  4 cr
This class will take a comparative approach to animal physiology. Comparisons of structural and functional relationships in the body systems of invertebrates and vertebrates, including humans, will be made. A basic foundation in chemistry and cell biology is required for this course. This course incorporates writing and computer components. Students will gain experience in critical analysis, research development and analysis, word processing, computer based statistical and graphical analysis, and in computer based presentation programs. Fee.
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 440  Biochemistry I  3 cr
Study of the fundamental biochemical concepts; emphasis is placed on protein, carbohydrate, and lipid structure as related to their functional behavior; enzymes kinetics and mechanisms of action; thermodynamic relationships in biochemical systems. Offered only in Fall term. Cross-listed with CH 440.
Pre-requisite: CH 202 Minimum Grade of D and BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 441  Biochemistry II  3 cr
Study of the reaction and regulations of intermediary metabolism; the biochemistry of genetics systems to include regulatory mechanisms and protein synthesis. Offered only in Spring term. Cross-listed with CH 441.
Pre-requisite: CH 202 Minimum Grade of C and BLY 440 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 304 Minimum Grade of C.

BLY 443  Lab Studies Biochemistry  2 cr
Course familiarizes the student with basic laboratory techniques commonly employed in biochemical research. Offered only in Spring term. Cross-listed with CH 443. Fee.
Pre-requisite: (BLY 440 Minimum Grade of D or CH 440 Minimum Grade of D) and (BLY 441 Minimum Grade of D or CH 441 Minimum Grade of D). BLY 441 and CH 441 can be taken concurrently with this course.
BLY 445  Computational Genetics-W  3 cr
An ever growing body of online genetic datasets and publically available software makes basic informatic analysis of genetic systems no longer restricted to programmers. Utilizing the principle online resources employed by researchers today, this course will provide advanced undergraduates with a solid foundation in computational biology as well as the competency to independently evaluate emerging resources in the future. Students enrolled in this course will gain real world experience in the application of informatic techniques through participating in an actual collaborative research analysis and through directly contributing to a peer-reviewed manuscript reporting their results. Requires permission of instructor.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 450  Animal Behavior  4 cr
Course examines animal behavior from a biological and empirical viewpoint, with an emphasis on behavioral adaptations of animals to their environment. Orientation, migration, rhythms, communication, territoriality, social and courtship behaviors will be considered within the context of ecology and evolution.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 451  Marine Vertebrate Zoology  4 cr
A study of marine vertebrates, with emphasis on fishes; their systematics, zoogeography, and ecology. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 452  Marine Mammals  4 cr
This is a marine field course designed to engage students in the collection, identification, and preservation of parasites of marine vertebrates and invertebrates. Each student will be required to submit a collection of parasites taken from beach, barrier island, estuarine, and pelagic (10-200km) offshore localities.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 455  Ornithology  4 cr
Principles of classification, structure, distribution, migration, natural history and adaptations of birds within an ecological context. Field & laboratory identification of birds by habitat, size, form, color, and sound. Some field activities may occur at times other than regularly scheduled laboratory hours.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C and BLY 121 Minimum Grade of C and BLY 121L Minimum Grade of C and BLY 122 Minimum Grade of C and BLY 122L Minimum Grade of C.

BLY 459  General Parasitology  4 cr
Ecology and evolution of parasites and a survey of all major parasitic groups.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 466  Introduction to Neurobiology  3 cr
Neuroanatomy and neurophysiology of marine invertebrates and vertebrates. Topics include resting and action potentials, synaptic transmission, neurotransmitters, sensory transduction, muscle innervation, sensorimotor transformations, and the neurophysiological basis of behavior. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 470  Herpetology  4 cr
A field course that emphasizes the ecology, evolution, natural history, characteristics, structure, function, geographic distribution, behavior, and systematics of amphibians and reptiles. Course includes structured writing assignments and focuses on good writing skills and forms. Laboratory and field work emphasize identification of specimens by name, habitat, and characteristics. Some field activities will occur at times other than the scheduled laboratory hours.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.
BLY 471  Mar Invertebrate Zoology  4 cr
A study of the natural history, systematics, and morphology of marine invertebrates. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 472  Marine Behavioral Ecology  4 cr
The ecological and evolutionary significance of animal behaviors in the marine environment. Exercises will include analysis of data collected from laboratory and field experiments. Statistics recommended. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 474  Intro to Oceanography  4 cr
A general introduction to the oceans, with emphasis on chemical, physical, and geological processes and their relation to biological systems. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 475  Marine Ecology  4 cr
The relationship of marine organisms to their environment. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 478  Coastal Wetlands Ecology  4 cr
This course will focus on near shore wetland areas and emphasize biogeochemical processes, productivity, biodiversity and ecosystem function, as well as address the issues that threaten and protect these valuable resources. Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 483  Field Marine Science  1 TO 4 cr
Course consists of a 10-day field exercise in the tropical southeastern Gulf of Mexico (Florida Keys) and the temperate north Atlantic. Sites alternate annually. Faculty members with diverse interest accompany the students, participate in pre-trip readings and discussion sessions and evaluate the product developed by each student. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 484  Conservation Biology  3 cr
The study of preserving biodiversity and sustaining ecosystems using a multidisciplinary approach. Primary emphasis will focus on the development of strategies for preservation and management using scientific principles and theory.
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 485  Evolutionary Biology  3 cr
The study of mechanisms and historical patterns of evolutionary change in biological systems ranging from genes to phylogeny.
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

BLY 490  Special Topics  1 TO 4 cr
Small interested groups of students will study specialized topics not generally listed in the course offerings. Faculty and visiting professors will offer courses in their areas of specialization. This course may be taken more than once if the topic changes for a total of eight hours. Requires permission of the department.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.

BLY 494  Directed Studies  1 TO 4 cr
Course is designed to enable the capable student to pursue independent research under the direction of a member of the faculty. Six hours of credit can be used to satisfy the 37 credit hours for the Biology major. Requires permission of the department chair.
Pre-requisite: BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C.
BLY 499  Honors Research in Biology-H-W  1 TO 6 cr
Experience in planning, conducting, and reporting a research project under the direction of the faculty. Requires overall GPA 3.0, Biology GPA 3.5, and permission of the faculty. Fee.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (CH 115 Minimum Grade of D or CH 131 Minimum Grade of D) and (CH 116 Minimum Grade of D or CH 132 Minimum Grade of D).

BLY 510  Prof in Science  3 cr
The overall goal for this course to convey expectations and important "survival skills" required to succeed in the competitive world of science. Emphasis is placed on grant writing, publications, tenure and promotion, collegiality, productivity creativity, building a CV, alternative paths, and achieving balance between the professional and private life.

BLY 511  Developmental Biology  3 cr
A study of the principles that regulate the development of a complex, multicellular organism from a single cell with a focus on the underlying molecular mechanism and genetic regulation. Topics to be covered will include fertilization, differentiation, cell fate determination, pattern formation, organogenesis, and regeneration. Particular emphasis will be placed on the experimental approaches, both historical and contemporary, that led to our current understanding of the development of multicellular organisms.
Pre-requisite: (BLY 302 Minimum Grade of D or BLY 311 Minimum Grade of D) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (CH 115 Minimum Grade of C or BLY 302 Minimum Grade of C).

BLY 514  Expt Bact Genomics  4 cr
An integrated lab-lecture course utilizing real-world research experience to explore the molecular genetics and genomics of bacteria. Students will be directly involved in the design, execution, analysis, and presentation of group research projects determining the function of genes from completed microbial genomes. A basic foundation in microbiology and genetics is required for this course.

BLY 515  Ecotoxicology  4 cr
The impact of chemicals as toxic agents on ecosystems. Students will understand types, sources, and effects of environmental toxicants, methods of testing and interpretation, and regulation of environmental toxicants. This material will be presented in the context of ecosystem health rather than human health. This is a core course for MS degree students in the Environmental Toxicology program.

BLY 520  Biometry  4 cr
The application of statistical methodology, both univariate and multivariate techniques, to the solution of biological problems. This course is not designed as a substitute for instruction in statistics, but rather to complement previous course work. The laboratory will involve the use of PC computers to perform procedures on biological data and subsequent interpretation of the results. Prerequisites can be waived at the discretion of the instructor.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (ST 175 Minimum Grade of D or ST 210 Minimum Grade of D or ST 540 Minimum Grade of C).

BLY 525  Chemical Ecology  3 cr
Chemical Ecology focuses on chemically mediated interactions within organisms in both aquatic and terrestrial environments. The topics covered include: chemoreception, chemical defense, chemical attraction, and the impact of chemical ecology on humans. Students will gain experience in critical analysis, research development, grant writing, and computer-based presentation. Requires permission of instructor.
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C) and (CH 201 Minimum Grade of C or CH 222 Minimum Grade of C).

BLY 526  Freshwater Ecology  3 cr
Course examines four aspects of freshwater ecology: physical and chemical properties of water, biotic communities, links among freshwater systems, and human influences on freshwater ecosystems. Students will be required to submit a collection of local freshwater invertebrates. Prerequisite: Ecology (equivalent to BLY 303). This prerequisite may be waived at the discretion of the instructor. Dual listed with BLY 426.
Pre-requisite: BLY 303 Minimum Grade of C.

BLY 530  Marine Microbial Ecology  3 cr
A general survey of the types of microorganisms found in the marine environment. Emphasis will be on the interaction of microorganisms with each other and with their environment. In particular, the role of microorganisms in the carbon cycling and biogeochemical processes will be stressed. Readings from current literature will expose students to the latest techniques and research.

BLY 533  Topics in Parasitology  3 cr
Theoretical aspects of parasite ecology, evolution, and physiology, with emphasis on current literature.
BLY 534  Plant Physiological Ecology  3 cr
This course is an investigation into how plants function in their environment and is designed to meet the needs of students majoring in biology, ecology and/or various disciplines in plant biology. This course explores plant biology, plant-animal interactions, as well as, principles of ecology and evolution.
Pre-requisite: BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C and BLY 301 Minimum Grade of C and BLY 302 Minimum Grade of C and BLY 303 Minimum Grade of C and BLY 431 Minimum Grade of C.

BLY 535  Biology of Fungi  4 cr
Identification and morphology of fungi with some emphasis on their relation to human affairs. Collection required. Credit for both BLY 535 and 435 is not allowed.

BLY 540  Biochemistry I  3 cr
Study of the fundamental biochemical concepts; emphasis is placed on protein, carbohydrate, and lipid structure as related to their functional behavior; enzymes kinetics and mechanisms of action; thermodynamic relationships in biochemical systems. Offered only in Fall term. Cross-listed with CH 540.
Pre-requisite: (CH 201 Minimum Grade of D or CH 222 Minimum Grade of D) and (CH 202 Minimum Grade of D or CH 223 Minimum Grade of D).

BLY 541  Biochemistry II  3 cr
Study of the reaction and regulations of intermediary metabolism; the biochemistry of genetics systems to include regulatory mechanisms and protein synthesis. Offered only in Spring term. Cross-listed with CH 541.
Pre-requisite: BLY 540 Minimum Grade of B. BLY 540 can be taken concurrently with this course.

BLY 543  Lab Studies Biochemistry  2 cr
Course familiarizes the student with basic laboratory techniques commonly employed in biochemical research. Offered only in Spring term. Cross-listed with CH 543. Fee. Pre-requisite: BLY 440 Minimum Grade of D or BLY 441 Minimum Grade of D or BLY 540 Minimum Grade of B or BLY 541 Minimum Grade of B.

BLY 544  Molecular Biology  3 cr
BLY 544 is a graduate course that covers the basic mechanisms by which organisms utilize, maintain and duplicate their genetic information. Topics to be covered include: organization of genes, the mechanisms and regulation of transcription, RNA processing and translation, the packaging of DNA as chromatin and its impact on gene expression, DNA replication, recombination and repair, and genomics and proteomics.

BLY 545  Bioinformatics of Genetics  1 cr
The sequencing of whole genomes and the analysis of genetic information continues fundamentally change biological and medical research. Recent advances in high-throughput sequencing have generated massive amounts of largely untapped genetic information. Utilizing the principal online resources employed by researchers today, this course will provide graduate students with a solid bioinformatic foundation to analyze current sequencing data sets, as well as the competency to independently evaluate emerging computational resources in the future.
Pre-requisite: BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C.

BLY 550  Animal Behavior  4 cr
This course will examine animal behavior from a biological and empirical viewpoint, with an emphasis on behavioral adaptations of animals to their environment. Orientation, migration, rhythms, communication, territoriality, social and courtship behaviors will be considered within the context of ecology and evolution. Credit for both BLY 450 and BLY 550 is not allowed.

BLY 551  Marine Vertebrate Zoology  4 cr
A study of marine vertebrates with emphasis on fishes; their systematics, zoogeography, and ecology. Students will have an opportunity to assemble a collection of vertebrate species. Course offered only through Marine Environmental Sciences Consortium. Credit for both BLY 551 and BLY 451 is not allowed.

BLY 554  Advanced Entomology  4 cr
Course emphasizes form, function, classification, behavior, taxonomy and evolution of insects. In addition, the student is required to make an insect collection of adult and immature insects.

BLY 566  Introduction to Neurobiology  4 cr
Neuroanatomy and neurophysiology of marine invertebrates and vertebrates. Topics include resting and action potentials, synaptic transmission, neurotransmitters, sensory transduction, muscle innervation, sensoriomotor transformations, and the neurophysiological basis of behavior. Credit for BLY 566 and 466 is not allowed.
Pre-requisite: (BLY 121 Minimum Grade of C and BLY 121L Minimum Grade of C) or (BLY 122 Minimum Grade of C and BLY 122L Minimum Grade of C) or (BLY 121 Minimum Grade of C and BLY 122 Minimum Grade of C).

BLY 570  Herpetology  4 cr
A field course that emphasizes the ecology, evolution, natural history, characteristics, structure, function, geographic distribution, behavior, and systematics of amphibians and reptiles. Course includes structured writing assignments and focuses on good writing skills and forms. Laboratory and field work emphasize identification of specimens by name, habitat, and characteristics. Some field activities will occur at times other than the scheduled laboratory hours. Oral classroom presentations required. Credit for BLY 470 and BLY 570 is not allowed.
BLY 571  Marine Invertebrate Zoology  4 cr
A study of the natural history, systematics and morphology of marine invertebrates. Credit for both BLY 571 and BLY 471 is not allowed.

BLY 572  Marine Behavioral Ecology  4 cr
The ecological and evolutionary significance of animal behaviors in the marine environment. Exercises will include analysis of data collected from laboratory and field experiments. Statistics recommended. Credit for BLY 572 and BLY 472 is not allowed.
Pre-requisite: (BLY 122 Minimum Grade of C and BLY 122L Minimum Grade of C) or BLY 142 Minimum Grade of C.

BLY 573  Oceanol Gulf of Mexico  3 cr
A descriptive study of the oceanology of the Gulf of Mexico, and adjacent waters, including coastal zone, continental shelf, and deep ocean.

BLY 575  Marine Ecology  4 cr
Their relationship of marine organisms to their environment. Credit for both BLY 575 and BLY 475 is not allowed.

BLY 583  Field Marine Science I  1 TO 4 cr
The Field Marine Science course will consist of an 8 - 12 day field exercise in representative coastal sites. The field exercise is conducted in the term break prior to the term of registration for the course. Faculty members with diverse interests will accompany the students, participate in pre-trip discussions and evaluate the product developed by each student. The course is designed to familiarize students with habitats and research conditions different from those they experience on the Northern Gulf Coast. Field trip locations are selected on the basis of faculty and student interest, economics, and availability of logistical support. Students pay their room and board costs for the field exercise. The course is primarily for graduate students, but advanced undergraduates may enroll with consent of instructor. Both BLY 483/583 and 488/588 may be taken for credit when each is taught in a different environment.

BLY 585  Evolutionary Biology  3 cr
The study of mechanisms and historical patterns of evolutionary change in biological systems ranging from genes to phylogeny.

BLY 589  Marine Plankton  3 cr
The course familiarizes the student with the taxonomic breadth of phytoplankton, bacterioplankton and zooplankton in estuaries, coastal seas and open oceans. Though the focus is on taxonomic familiarization, basic biology of all major taxa, represented in the plankton will be covered. Students will learn fundamental, as well as "cutting-edge", field, lab, and statistical techniques.

BLY 590  Special Topics -  1 TO 4 cr
Small, interested groups of students will study specialized topics not generally listed in the course offerings. Faculty and visiting professors will offer courses in their areas of specialization. This course may be taken more than once if the topic changes for a total of eight hours. Requires permission of the department.

BLY 592  Seminar  1 cr
Recent research in areas of special academic interest to students and faculty.

BLY 594  Directed Studies -  1 TO 4 cr
Independent research under the direction of a member of the graduate faculty. A maximum of six credits may be used to meet degree requirements. Permission of instructor required.

BLY 599  Thesis  1 TO 4 cr
Requires approval of research prospectus by student's graduate committee.

Biomedical Sciences (BMD)

BMD 210L  Microbiology in Healthcare Lab  1 cr
Laboratory experience includes introduction to fundamental microbial techniques, including differential staining, biochemical identification techniques, and antimicrobial susceptibility testing. Patient case studies will be used to supplement learning experience.
Pre-requisite: (BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C). BLY 101 Minimum Grade of C or CH 101 Minimum Grade of C or CH 131 Minimum Grade of C).

BMD 110  Introduction to A & P I  4 cr
An introduction to the structure and function of the human body with an emphasis on anatomy. This course surveys anatomical terminology, basic chemistry, cell structure/function, tissues, skin skeleton, joints, muscles, and central nervous system.

BMD 111  Introduction to A & P II  4 cr
Continuation of BMD 110. Topics include, peripheral/autonomic nervous system, endocrinology, cardiovascular system, blood, respiration, digestion, metabolism/nutrition, urinary system, and reproduction.
Pre-requisite: BMD 110 Minimum Grade of C.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>BMD 200</td>
<td>Career Planning</td>
<td>1 cr</td>
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<td>Clinical Observations (Medicine, Dentistry, Optometry and Veterinary Medicine). This course gives the student clinical exposure to various health-care services. It is designed to help students make informed decisions when selecting a career in the health professions. A written report on the clinical experience or scenario dealing with &quot;medical ethics&quot; is required. May be repeated for a maximum of six hours' credit. Prereq: Permission of the Director of Health Pre-Professional Program. Pre-requisite: CH 131 Minimum Grade of D and BLY 121 Minimum Grade of D.</td>
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<tr>
<td>BMD 201</td>
<td>Seminars in Biomedical Science</td>
<td>1 cr</td>
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<td>This course introduces students to contemporary biomedical research and career possibilities in the biomedical sciences. Students will use the resources of the Biomedical Library to perform a literature search.</td>
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<tr>
<td>BMD 210</td>
<td>Microbiology in Healthcare</td>
<td>3 cr</td>
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<td>This course introduces concepts of human host-infectious microbe interactions that result in disease. Microorganisms examined include viruses, parasites, fungi, mycobacteria, and bacteria. Included topics are genetics, taxonomy, microbial metabolism, virulence factors, host defense/microbe evasion mechanisms, epidemiology, antimicrobial chemotherapy/resistance, merging/reemerging infectious diseases, and diagnostic criteria. Emphasis will be placed on the microbial infections of different body systems. Pre-requisite: BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C or CH 131 Minimum Grade of C.</td>
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<tr>
<td>BMD 251</td>
<td>Human Anatomy &amp; Physiology I</td>
<td>4 cr</td>
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<td>This is the first of a two-course sequence that covers basic human anatomy and physiology, including the study of the structure and function of various body systems. Included is a study of basic principles of organism homeostasis, biochemical makeup, a study of cells and tissue, cellular metabolism, joints, the integumentary, and skeletal systems, muscular and nervous systems, and the senses. Laboratory experiences are provided through demonstration and interactive (virtual) laboratories. Pre-requisite: BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C or CH 101 Minimum Grade of C or CH 131 Minimum Grade of C.</td>
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<tr>
<td>BMD 252</td>
<td>Human Anatomy &amp; Physiology II</td>
<td>4 cr</td>
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<td>A continuation of BMD 251. Topics include nervous, cardiovascular, lymphatic, immune, respiratory, digestive, and urinary systems. Additional topics may include blood, metabolism, immunology and reproduction. Laboratory experience is provided through demonstration and interactive (virtual) laboratories. Pre-requisite: BMD 251 Minimum Grade of C.</td>
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<tr>
<td>BMD 290</td>
<td>Sp Top - H</td>
<td>1 TO 3 cr</td>
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<td>Topics of current health interest.</td>
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<tr>
<td>BMD 311</td>
<td>Human Anatomy</td>
<td>3 cr</td>
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<td>A course in human gross and microscopic anatomy in a systematic approach, with an emphasis on structure-function relationships at the cell, tissue and organ level. The topics include anatomy of integumentary, musculoskeletal, nervous, cardio-vascular, lymphatic, respiratory, digestive, urinary and reproductive systems. This course is lecture-based with no lab component. Pre-requisite: BLY 122 Minimum Grade of D.</td>
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<tr>
<td>BMD 321</td>
<td>Biochemistry I-Molecular Biol</td>
<td>3 cr</td>
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<td>The course covers different aspects of molecular biology including protein structure and function, carbohydrate, lipids, DNA replication, transcription and translation and applications to medical problems (i.e., forensic medicine, diagnosis of genetic diseases, etc). Pre-requisite: CH 201 Minimum Grade of D.</td>
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<tr>
<td>BMD 322</td>
<td>Biochemistry II-Metabolism</td>
<td>3 cr</td>
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<td>The course discusses the chemical basis of metabolism including the conversion of nutrients from digestion to either molecules of biological relevance or to energy. Genetic diseases affecting these pathways are described and discussed. Pre-requisite: BMD 321 Minimum Grade of C and CH 202 Minimum Grade of D.</td>
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<td>BMD 323</td>
<td>Biochemistry Laboratory</td>
<td>1 cr</td>
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<td>This laboratory is designed to provide hands-on experience on several biochemical techniques including cell fractionation, chromatography, DNA isolation, electrophoresis, determination of enzyme activity, etc. Co-requisite: BMD 322 Pre-requisite: BMD 321 Minimum Grade of C.</td>
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<tr>
<td>BMD 334</td>
<td>Human Physiology I</td>
<td>3 cr</td>
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<td>The objectives of this course are to study human physiology with emphasis on cellular physiology (cell structure, metabolism, and transport) and the endocrine and nervous systems and skeletal muscle. This course is the first of a 2 course sequence. Pre-requisite: BLY 121 Minimum Grade of D and BLY 122 Minimum Grade of D and CH 131 Minimum Grade of D and CH 132 Minimum Grade of D.</td>
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<tr>
<td>BMD 335</td>
<td>Human Physiology II</td>
<td>3 cr</td>
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<td>Study of human physiology with emphasis on the basic principles of organ system physiology. The course emphasizes muscle, cardiovascular, renal, respiratory, digestive, and reproductive physiology and an introduction to immunology. This is the second course in a 2 course sequence. Pre-requisite: BMD 334 Minimum Grade of C.</td>
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BMD 336  Physiology Lab - W  1 cr
This laboratory is designed to provide students with hands-on laboratory experience in physiology, with emphasis on the musculoskeletal, cardiovascular, respiratory and nervous systems. Limited to BMD majors unless by special permission. Special fee.
Co-requisite: BMD 335
Pre-requisite: BMD 334 Minimum Grade of C.

BMD 350  Human Genetics and Genomics  3 cr
The course is designed to introduce students to the fundamental concepts of molecular genetics and genomics. The concepts that will be covered in this course include nucleic acid structure and function, mechanisms of replication, transcription, translation, gene expression and regulation. In addition, the course aims to familiarize students with modes of analysis used in comparative genomic research.
Pre-requisite: BMD 321 or BLY 301 or BLY 440.

BMD 390  Sp Top -  1 TO 3 cr
Topics of current health interest.

BMD 401  Immunology  3 cr
This course presents the basic concepts of immunoochemistry, immunobiology and host immune responses to disease. Antigens, antibodies, cells and structures of the immune system will be discussed as well as their roles in the processes of immunity, allergies, transplantation, and diseases.
Pre-requisite: BMD 321 Minimum Grade of C. BMD 321 can be taken concurrently with this course.

BMD 402  Medical Microbiology  4 cr
This course presents the concepts of pathogenicity and virulence as they relate to disease causing bacteria, mycobacteria, fungi, protozoans, and viruses. Mechanisms of pathogenicity, host interactions, epidemiology and diagnosis will be emphasized. General concepts of microbial physiology, taxonomy, genetics, host immune response, and antimicrobial therapy are also presented. The laboratory portion of the course will provide hands-on experience in the handling and identification of each microbe class. Special fee.
Pre-requisite: BMD 321 Minimum Grade of C.

BMD 410  Pathophysiology  3 cr
A systematic study of disease processes involving relationships between pathophysiological changes and clinical manifestations.
Pre-requisite: BMD 321 Minimum Grade of C.

BMD 420  Pharmacology  3 cr
An introduction to pharmacological concepts and effects and uses of major drug classes. Drug design, pharmacodynamics (receptors, mechanisms, dose-response) and pharmacokinetics (time action) are discussed in general (principles), and in particular, for selected classes of drugs.
Pre-requisite: BMD 321 Minimum Grade of C and BMD 322 Minimum Grade of C and BMD 334 Minimum Grade of C and BMD 335 Minimum Grade of C.

BMD 430  Neurosciences  4 cr
A study of neuroscience which integrates neurochemistry, neuroanatomy, and neurophysiology, emphasizing cellular neurobiology, neural systems, and the neurobiology of behavior. Course includes laboratory experience.
Pre-requisite: BMD 311 Minimum Grade of C and BMD 334 Minimum Grade of C.

BMD 450  Introduction to Research  2 cr
Fundamental principles of research will be presented and applied. Students will examine and evaluate a selection of contemporary research and learn many of the responsibilities of professional researchers, particularly in academic settings. Oral classroom presentations are required.
Pre-requisite: BMD 311 Minimum Grade of C and BMD 322 Minimum Grade of C and BMD 323 Minimum Grade of C and BMD 325 Minimum Grade of C and BMD 336 Minimum Grade of C.

BMD 490  Special Topics  1 TO 3 cr
Topics of current health interest.

BMD 493  Issues in Biomed Sciences - W  3 cr
This course will provide an open forum for discussion of current controversial issues in biomedical sciences. The topics will include research integrity, discussions on the impact of medical advances in society as well as issues of historical relevance.
Pre-requisite: BMD 321 Minimum Grade of C.

BMD 494  Directed Research Studies  1 TO 3 cr
The student will perform a biomedical research project under the direction of a faculty mentor. This will include literature searches and presenting the project in a written format. Instructor Permission Required.
Pre-requisite: BMD 321 Minimum Grade of C.

BMD 499  Honors Research Thesis - W - H  1 TO 6 cr
Literature survey and laboratory research experience under the direction of the faculty. Instructor permission required.
Pre-requisite: BMD 311 Minimum Grade of C and BMD 322 Minimum Grade of C and BMD 323 Minimum Grade of C and BMD 325 Minimum Grade of C and BMD 336 Minimum Grade of C.
BMD 501 Immunology 3 cr
This course presents the basic concepts of immunobiology and host immune responses to disease, antigens, antibodies, cells and structures of the immune system will be discussed as well as their roles in the process of immunity, allergies, transplantation and diseases. A term paper is required.

BMD 502 Medical Microbiology 5 cr
The course presents the concept of pathogenicity and virulence as they relate to disease causing bacteria, viruses, and fungi. Mechanisms of pathogenicity, interrelationships, and interactions that occur between the host, the parasite and their environments will be emphasized in molecular terms. General concepts of microbial physiology, genetics, and antimicrobial therapy are also presented. The laboratory portion of the course will provide hands-on experience in the handling and identification of bacteria. A term paper is required.

Business (BUS)

BUS 101 Prof Experience I 1 cr
An introduction to career success tools including: personality and career interest inventories, steps to success, resume preparation, business ethics, personal branding, university and community involvement and other career preparation activities. This course is designed for students in their first and second semester within the MCOB.
Pre-requisite: EH 101 Minimum Grade of C or EH 102 Minimum Grade of C. EH 101 and EH 102 can be taken concurrently with this course.

BUS 150 Intro to Business and Mgt 3 cr
A survey of the field of business, including profit-seeking firms, not-for-profit organizations, and new businesses created by entrepreneurs. Emphasis on the business environment, organization and management, current economic and international issues, and career opportunities. Societal and ethical issues are also examined. Open to University of South Alabama freshmen only.
Pre-requisite: EH 101 Minimum Grade of C or EH 102 Minimum Grade of C. EH 101 and EH 102 can be taken concurrently with this course.

BUS 201 Professional Experience II 1 cr
Continued introduction to Career success tools including: resume building activities, cover letter and references development, career for a day shadowing, speed networking, career fair tools for success, university and community involvement and other career preparation activities. Prerequisite: C or better in BUS 101, Sophomore standing.
Pre-requisite: BUS 101 Minimum Grade of C.

BUS 245 Business Analytics I 3 cr
An introduction to data analytics in business that includes analysis to make data driven business decisions. This course utilizes statistical applications in business problems solving using descriptive statistics, probability theory, sampling distributions, methods of estimation, and tests of hypotheses. The course introduces students to basic predictive business modeling, and the communication of analytical results.
Pre-requisite: University test - Math 75 or MyMathTest 080 or ACT Math 23 or MA 112 Minimum Grade of D or MA 113 Minimum Grade of D or MA 115 Minimum Grade of D or MA 120 Minimum Grade of D or MA 121 Minimum Grade of D or MA 125 Minimum Grade of D or MA 126 Minimum Grade of D or MA 131 Minimum Grade of D or MA 132 Minimum Grade of D or MA 171 Minimum Grade of D or MA 172 Minimum Grade of D or MA 287 Minimum Grade of D.

BUS 255 Business Analytics II 3 cr
A second course in quantitative data analytics in business decision making utilizing methods of analysis including statistical inference, predictive, modeling, forecasting, correlation and regression analysis. It further develops fundamental knowledge and skills for making data driven business decisions including the use of computer applications for problem solving. This course relies heavily on project based learning to provide students with experience of solving data based business problems.
Pre-requisite: (BUS 245 Minimum Grade of C or BMS 245 Minimum Grade of D or BMS 250 Minimum Grade of D or ST 175 Minimum Grade of D or ST 210 Minimum Grade of D) and (University test - Math 75 or (MA 112 Minimum Grade of D or MA 115 Minimum Grade of D or MA 171 Minimum Grade of D or MA 172 Minimum Grade of D) or (MA 115 Minimum Grade of D or MA 121 Minimum Grade of D) or (MA 120 Minimum Grade of D or MA 287 Minimum Grade of D) or (MA 125 Minimum Grade of D or MA 132 Minimum Grade of D) or (MA 126 Minimum Grade of D or MA 233 Minimum Grade of D).

BUS 265 Legal Environ of Business I 3 cr
A study of the global legal environment in which contemporary American business functions, including a review of legal thought and ethical considerations and the foundations and impacts of governmental regulation in areas such as labor and employment, environmental concerns, consumer protection, and antitrust. Contemporary issues, domestic and international concepts and institutions, and social forces that shape the legal environment are emphasized. Requires sophomore standing.

BUS 301 Professional Experience III 1 cr
Career success tools including: personal professional strategic plan development, mock interviewing, dining etiquette, personal and professional mentoring, job search, application, and acceptance, job search ethics, creating a career plan, university and community involvement and other career preparation activities. Prerequisite: C or better in BUS 201, Junior standing.
Pre-requisite: BUS 201 Minimum Grade of C.
BUS 302  Professional Preparation  3 cr
Career success tools including personal professional
strategic plan development, interviewing, personal and
professional mentoring, job search, application, creating
a career plan, university and community involvement, and
other career preparation activities. Prerequisite: Junior
transfer standing. Business students only.

BUS 305  Information Systems and Tech  3 cr
The analysis, design and implementation of information
systems. Analysis of the functional area of business
and integration of computer tools to satisfy information
requirements. Current developments in business computer
systems, including surveys of current systems and the
Internet. Computer classrooms are utilized to provide
students with "hands on" experience.
Pre-requisite: CIS 250 Minimum Grade of D.

BUS 490  Special Topics  3 cr
Designed to provide senior students an opportunity to study
selected topics of particular interest. A student may count no
more than six hours of Special Topics in the concentration.
Prerequisite: Approval of Department Chair.

BUS 496  MCOB Honors Sr Project I - H  3 cr
Applied business project and paper prepared under the
direction of a project advisor plus two other persons
selected by the advisor in consultation with the student.
The student must have developed a proposal for the project
and paper in consultation with the advisor and received
permission from the committee to proceed. In addition,
the student must be entering his or her senior year and be
a major in the Mitchell College of Business. The project
proposal must be formulated no later than the end of the first
semester of the student's senior year and the project must
be completed by the student's graduation date. The student
must have maintained his or her standing in the university
honors program to be eligible to enroll in this course. The
student will formally enroll in the course in his or her last full
semester in school. The course may be counted in one or
two ways: 1) as an additional course not counting towards
the business degree, or 2) in special cases, as a major or
business elective, to be decided by the committee. Requires
completion of the business core with the exception of MGT
485.
Pre-requisite: BUS 496 Minimum Grade of C.

BUS 498  Mitchell Scholars Sr Project  3 cr
Applied business project and presentation prepared
under the direction of the instructor in consultation with the
student. This course will have irregular meetings
scheduled by the instructor and will have both a classroom
component and a project component. The student must
have maintained his/her standing in the Mitchell Scholars
program and be a senior to be eligible to enroll in this
course. This class will be counted in one of three ways:
1) as a business elective, 2) as an additional course not
counting towards the business degree; or 3) in special
cases, as a major elective to be decided by the major
department's faculty. Requires completion of the business
core with the exception of MGT 485 and approval of
Associate Dean.
Pre-requisite: Mitchell Scholars 10 and BUS 305 Minimum
Grade of D and FIN 315 Minimum Grade of D and MGT 300
Minimum Grade of D and MGT 305 Minimum Grade of D
and MGT 310 Minimum Grade of D and MGT 325 Minimum
Grade of D and MKT 320 Minimum Grade of D.

BUS 555  Study Abroad  3 TO 6 cr
Examines issues in business administration in an
international setting at the graduate level. Specific topics
selected from the fields of accounting, economics, finance,
information systems, management or marketing depending
on the instructor's area of expertise. Part or all of the course
will be conducted outside the United States. Prerequisite:
Permission to enroll in a relevant Mitchell College of
Business study abroad program.

BUS 600  Fund of Research  3 cr
This course provides students with the tools and perspective
necessary to succeed in the DBA program. Readings are
drawn from several sources and provide participants with a
better understanding of the way to approach their work.
BUS 602  Applied Stat and Reg  3 cr
This course provides an examination of statistical concepts used for business research. Topics include: fundamentals of probability, sampling, statistical estimation, test of hypotheses, analysis of variance, chi-square analysis and regression analysis. Emphasis is placed on the use of statistical techniques for business research applications.

BUS 604  Multivariate Analysis  3 cr
The course is designed to broaden and enrich a student's knowledge and understanding of statistical methodology as it pertains to the study of multivariate techniques used in behavioral research.

BUS 606  Research Design and Methods  3 cr
This course focuses on the general concepts related to conducting academic research and the various research methods commonly used in business research, including quantitative and qualitative analysis.

BUS 608  Adv Stats & App Res  6 cr
An examination of advanced statistical concepts used for business research. This course is designed to broaden and enrich students' knowledge and understanding of statistical methodology as it pertains to advanced techniques used in behavioral research. In addition, this course provides applied research opportunities to assist in advancing the student's research requirements necessary for degree completion.

BUS 610  Struct Equation Modeling  3 cr
This course provides students with a functional understanding of path analysis theory and procedures of structural equation modeling. Students will learn to specify, estimate, and evaluate models using software packages designed for this purpose.

BUS 699  Res and Teaching Concepts  1 cr
Presentations and discussions related to teaching and research concepts.

Cardiorespiratory Care (CRC)

CRC 330  CRC Assessmnt Skill  5 cr
A presentation of patient assessment skills to prepare for subsequent courses in the curriculum. Modules included are chart review and history, vital signs, physical assessment of the chest, chest radiography, laboratory assessment, bedside pulmonary function testing, electrocardiography, and cardiopulmonary resuscitation. Special Fee.

CRC 331  Respiratory Anatomy-Physiology  3 cr
The structure and function of the respiratory system will be discussed. Emphasis will be placed on (1) the physiologic ramifications associated with respiratory therapeutic intervention and (2) interrelationships between the pulmonary and renal systems and how these two systems influence and control the body’s acid-base status.

CRC 332  Intermittent & Diagnostic CRC  4 cr
This course will focus on cases involving patients receiving intermittent respiratory care modalities including oxygen and aerosol therapy, resuscitation, airway care, pharmacology, tracheobronchial hygiene, and lung expansion therapy. Infection control issues will be included. Diagnostic issues include pulmonary function testing and arterial blood gas analysis. Students will discuss the pathophysiology, health promotion and disease prevention aspects of each case. Relevant laboratory exercises will be conducted.

CRC 334  Pharmacology  3 cr
An overview of pharmacological principles will be presented. Emphasis will be given to drugs influencing the respiratory, cardiovascular, nervous, and renal systems.

CRC 335  Intensive CRC  5 cr
This course will focus on cases involving patients receiving intensive cardiorespiratory care modalities including mechanical ventilation, invasive and non-invasive monitoring, artificial airways. Diagnostic issues will include hemodynamic monitoring and fiberoptic bronchoscopy. Students will discuss the pharmacology, pathophysiology, health promotion and disease prevention aspects of each case. Relevant laboratory exercises will be conducted.

CRC 342  Intermittent CRC Practicum  3 cr
Clinical experiences are conducted in the care of patients who are receiving respiratory care modalities, as discussed in the cases in CRC 330.

CRC 345  Intensive Cardioresp Care Prac  5 cr
Clinical experiences will involve patients who receive intermittent and intensive care modalities and diagnostic procedures discussed in the cases in CRC 335.

CRC 346  Intensive CRC Practicum II  3 cr
This is the second part of a two-part course. This course will focus on cases involving patients receiving intensive cardiorespiratory care modalities including mechanical ventilation, invasive and non-invasive monitoring, and artificial airways. Diagnostic issues will include pulmonary function testing, hemodynamic monitoring and fiber optic bronchoscopy. Students will discuss the pharmacology, pathophysiology, health promotion and disease prevention aspects of each case. Successful completion of this course will help prepare for the National Board for Respiratory Care (NBRC) Therapist Multiple Choice and Clinical Simulation examinations.

CRC 415  Research Methodology  2 cr
A survey of research designs, methods, and evaluative techniques, applicable to basic science and clinical research studies.
CRC 428  Cardiorespiratory Diseases  3 cr
This course will discuss the pathophysiology, signs and symptoms, patient assessment, diagnostic testing, laboratory data, and respiratory therapeutic interventions pertaining to common pulmonary, cardiac, and cardiovascular disease. Review of electrocardiography and Advanced Cardiac Life Support are included. The role of the respiratory therapist during bronchoscopy is also presented. Special Fee.

CRC 430  Neonatal/Pediatric CRC  2 cr
This course will focus on cases involving infants and children. Topics include developmental anatomy and physiology, assessment, pathophysiology, basic and intensive care, pharmacology, extracorporeal membrane oxygenation, and resuscitation. Students will discuss the pharmacology, pathophysiology, health promotion and disease prevention aspects of each case. Relevant laboratory exercises will be conducted.

CRC 435  Critical Care Concepts  3 cr
This course presents current theories and applications of adult critical care, in addition to those of mechanical ventilation. It focuses on pathophysiology, diagnostic procedures, and clinical presentation of disease.

CRC 440  Advanced Clinical I  6 cr
Clinical experiences will involve three major areas: the care of neonatal and pediatric patients receiving intermittent and intensive cardiorespiratory care (as discussed in the CRC 430 course); the care of patients in subacute settings (such as the sleep laboratory, long-term care, pulmonary rehabilitation, and home care); and diagnostic procedures (such as pulmonary function testing, cardiac catheterization, and bronchoscopy).

CRC 441  Advanced Clinical II  6 cr
This course presents current knowledge of adult critical care. The four components are advanced patient assessment, advanced respiratory care, surgical issues, and medical issues. This course includes selected content from the matrix of the National Board for Respiratory Care Adult Critical Care Specialist examination.

CRC 446  CRC Education  2 cr
Fundamental educational principles will be the focal point. These principles include writing instructional objectives, developing didactic, laboratory, and clinical instructional strategies, and constructing evaluation instruments. Accreditation and credentialing issues will also be addressed. Developing and presenting one major instructional topic will be a requirement for each student.

CRC 447  CRC Management  2 cr
This course will provide the student with experiences and projects pertaining to the management of a respiratory therapy and cardiopulmonary department. Some management functions include: JCAHO respiratory therapy standards, staff scheduling, departmental budgeting, quality assurance, evaluation of personnel, purchasing, and grievance procedures.

CRC 450  Clinical Research I - W  2 cr
This is the first part of a two-part course. Students will design and perform a research project, relating to either clinical practice, education, or management. The work involved in this course will extend through two successive semesters. Students register for CRC 450 in the Fall Semester of the senior year for two credit hours and for CRC 451 in the Spring Semester for two credit hours.

CRC 451  Clinical Research II - W  2 cr
This is the second part of a two-part course. Students will design and perform a research project, relating to either clinical practice, education, or management. The work involved in this course will extend through two successive semesters. Students register for CRC 450 in the Fall Semester of the senior year for two credit hours and for CRC 451 in the Spring Semester for two credit hours.

CRC 460  Advanced-Level Exam Review  3 cr
This course reviews the contents of the Therapist Multiple-Choice and Clinical Simulation Examinations offered by the National Board for Respiratory Care (NBRC). Respiratory therapy equipment, therapeutic modalities, therapeutic interventions, medications, and related procedures relevant to these examinations will be reviewed in the form of assignments, discussions, and practice examinations. Special fee.

CRC 499  Senior Honors Project - W - H  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project relevant to the field of Cardiorespiratory Care study that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty members, chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to 6 credit hours. Requires permission of department chair and completion of an approved project prospectus.

CRC 533  Obstructive Pulmonary Dis Mgt  3 cr
This course provides the information necessary for disease management of patients with obstructive pulmonary diseases (OPD). Emphasis will be placed on epidemiology, clinical manifestations, diagnosis, patient and family teaching skills, and patient management. Smoking cessation techniques are included. The administrative aspects of establishing a program/clinic and reimbursement issues will be discussed. This course is open to registered respiratory therapists and registered nurses (with a baccalaureate degree), nurse practitioners, NP students, physician assistants and PA students. Successful completion of this course will help prepare for the National Asthma Education Certification Board examination.
**CRC 543  Obstruct Pulm Dis Mgt-Clinical   3 cr**
This course provides the clinical skills necessary for COPD and asthma management. Emphasis is on the clinical manifestations, verifying diagnosis, patient and family teaching skills, smoking cessation techniques, administrative aspects of establishing a clinic and reimbursement, and disease management, in several clinical settings. This course is the clinical correlate of CRC 533, open to registered respiratory therapists and registered nurses (with a baccalaureate degree), nurse practitioners, NP students, physician assistants, and PA students. Successful completion of this course will help prepare for the National Asthma Education Certification Board examination.

**CRC 590  Sp Topics Resp Ther Education   3 cr**
Topics will include accreditation, use of NBRC school score reports and self-assessment examinations, roles of key personnel, tenure and promotion policies, the instructor's roles in classroom, laboratory and clinical instruction, student evaluation, student counseling and services, higher education law, and current issues in respiratory therapy and allied health education.

**Career Planning (CP)**

**CP 101  Freshman Sem-Continuing Educ   2 cr**
A course for first-time students that assists with maximizing the student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by college life. This course provides an introduction to the nature of higher education and a general orientation to the functions and resources of the University. Extensive reading and writing assignments relevant to the student's first year experience are required.

**CP 250  Career Planning and Develop   3 cr**
Principles, methods, and practice in career planning and development with emphasis on career information, self-analysis, exploration of careers, career opportunities, guidelines for goal achievement.

**CP 450  The Job Campaign   3 cr**
Practical approach to career development designed to help students develop strategies for obtaining suitable employment and making career choices. Emphasis is on the principles, methods, and practice in achieving career goals through the study of careers, preparing resumes, writing letters of application, practicing job interview techniques, and identifying prospective employers.

**Cell Biology And Neuroscience (CBN)**

**CBN 112R  Medical Histology   8 cr**
Summer make-up course in Medical Histology at an LCME approved medical school.

**CBN 114  Neuroanatomy   4 cr**
The course consists of both laboratory and lecture material. Emphasis is given to the functional neurobiology of the human central nervous system. In addition to basic anatomical systems, considerable time is given to the delineation of the anatomical bases of human CNS dysfunction.

**CBN 400  Cell Biol & Neuro Externship   4 cr**
To be determined.

**CBN 405  Research Assistantship   1 TO 4 cr**
Teaching assistantships are available in the following areas: head and neck; thorax and abdomen; pelvis and perineum; or extremities.

**CBN 406  Teach Asst-Histology   1 TO 4 cr**
Participants will assist the faculty in teaching histology laboratories either pertaining to tissues (4 weeks) or organ systems (4 weeks, or 8 weeks for both). The student will be mentored by one of the listed faculty who will assume responsibility for the final evaluation of the student.

**CBN 407  Teach Assistantship - Anatomy   1 TO 4 cr**
Teaching assistantships are available in the following areas: head and neck; thorax and abdomen; pelvis and perineum or extremities.

**CBN 516  Cell Biol-Neurosci Lit Reports   1 cr**
Students and faculty participate in a supervised reading of the current literature and meet periodically (usually once a week) to interact in a discussion of the selected article or topic. The goal of this course is to maintain the faculty's and students' level of information at the "state of the art" in both methods and theory in the discipline to develop critical review skills in reviewing the literature. Student presentation is required to receive credit.

**CBN 517  Dir St - Cell Bio Neuroscience   1 TO 6 cr**
Students participate in research under the direction of a graduate faculty member. The student may pursue independent research or participate in a literature project. This course should be taken by students who have completed their laboratory rotations, but have not yet submitted a research proposal.
CBN 590  Sp Top - 1 TO 3 cr
This course provides in-depth tutorial exposure to specific areas in the discipline. Student and/or faculty presentations followed by group discussion (usually in the Socratic mode), examine the subject matter in an area of current interest either to one student or to a group of students. Credit and title are arranged with an individual faculty member.

CBN 610  Molecular-Cellular Neuroscienc 2 cr
A course which requires students to read and evaluate critically the contemporary literature dealing with the cellular and molecular mechanisms of neural function.

CBN 614  Gene Expr- Reg- Repair- Ther 2 cr
This course requires students to read, present, and evaluate critically the modern literature on gene expression and regulation, repair and therapy.

CBN 616  Cell Biol-Neurosci Resrch Sem 1 cr
Students and faculty present a research topic for discussion before members of the department. The presentations are usually scheduled on a rotational basis. The student may present research data for critique by the faculty.

CBN 799  Research Dissertation 1 TO 6 cr
Independent research by the student under the sponsorship of the graduate faculty. Students are required to submit a research project description form before enrolling in this course. Progress reports of the work accomplished are required every six months.

Chemical Engineering (CHE)

CHE 190  Special Topics - 1 TO 5 cr
Topics of current Chemical Engineering interest. Requires permission of department chair. Fee.

CHE 203  Material & Energy Balances 4 cr
Application of multicomponent material and energy balances to chemical processes involving phase changes and chemical reactions. Minimum grade of 'C' is required and only 2 attempts are permitted. Fee
Pre-requisite: CH 132 Minimum Grade of C and CH 132L Minimum Grade of C and MA 126 Minimum Grade of C and (EH 101 Minimum Grade of C or EH 105 Minimum Grade of C or ACT English 27 or SAT Critical Reading 610 or READING TEST SCORE 33 or University - EH101 Exempt P ).

CHE 290  Special Topics - 1 TO 5 cr
Topics of current chemical engineering interest. Requires consent of department chair. Fee.

CHE 311  CHE Separations I 3 cr
Applications of material balances and equilibrium relations to equilibrium stage design. Design of single stages and cascades for absorption, stripping, distillation, liquid-liquid extraction, and bioseparations. Fee.
Co-requisite: CHE 331
Pre-requisite: CHE 203 Minimum Grade of C.

CHE 321  Transport Phenomena I 3 cr
Fundamentals of momentum transfer with applications in fluid flow through pipes and process equipment. Fee.
Pre-requisite: MA 238 Minimum Grade of C and CHE 203 Minimum Grade of C and PH 201 Minimum Grade of C.

CHE 322  Transport Phenomena II 3 cr
Fundamentals of conductive, convective, and radiative modes of heat transfer with applications in the design of heat exchangers. Fee.
Pre-requisite: CHE 321 Minimum Grade of C.

CHE 331  CHE Thermodynamics I 3 cr
This course introduces the fundamentals of thermophysical property estimation and modeling of non-ideal pure and multicomponent fluid systems, including an introduction to multicomponent vapor/liquid equilibria. Fee.
Co-requisite: CHE 351
Pre-requisite: CH 201 Minimum Grade of C and CHE 203 Minimum Grade of C and CH 201L Minimum Grade of C and MA 238 Minimum Grade of C and CH 201L Minimum Grade of C and PH 201 Minimum Grade of C.

CHE 332  CHE Thermodynamics II 3 cr
This class is an advanced thermodynamics course that uses a molecular level viewpoint to introduce students to applications of thermodynamics principles to complex chemical engineering problems including multicomponent, non-ideal fluid phase equilibria (VLE, VLLE, SLE), and chemical reaction equilibria. The concepts of chemical potential, fugacity, partial molar and excess properties as well as complex activity coefficient models are introduced to solve these problems. Fee.
Co-requisite: CHE 352
Pre-requisite: CHE 331 Minimum Grade of C.

CHE 342  Engineering Communication - W 3 cr
Formal and informal reports, oral presentations, and visual aids. Fee.
Co-requisite: CHE 352
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C.

CHE 351  Modeling Lab 1 cr
Computational tools and numerical methods for solving chemical engineering problems. Fee.
Co-requisite: CHE 311, CHE 331
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHE 352</td>
<td>Measurement Lab</td>
<td>1 cr</td>
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<td>Laboratory practices for measurement of reaction and phase change parameters. Statistical tools for assessing experimental data. Fee. Co-requisite: CHE 332, CHE 372 Pre-requisite: CHE 351 Minimum Grade of C.</td>
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<tr>
<td>CHE 372</td>
<td>Chemical Reactor Design</td>
<td>3 cr</td>
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<td>Fundamentals of systems involving chemical reactions, including batch and flow systems. Design of thermal and catalytic systems with single and multiple reactions. Analysis of kinetic data and mechanisms. Fee. Co-requisite: CHE 322, CHE 332 Pre-requisite: CHE 331 Minimum Grade of C.</td>
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<tr>
<td>CHE 390</td>
<td>Special Topics -</td>
<td>1 TO 5 cr</td>
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<td>Topics of current chemical engineering interest. Requires consent of department chair. Fee.</td>
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<tr>
<td>CHE 421</td>
<td>CHE Separations II</td>
<td>3 cr</td>
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<td>Fundamentals of mass transfer. Mass, energy, and momentum transfer analogies. Design of mass transfer equipment. Fee. Pre-requisite: CHE 311 Minimum Grade of C and CHE 322 Minimum Grade of C.</td>
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<tr>
<td>CHE 441</td>
<td>Chem Engr Ops Lab I - W</td>
<td>2 cr</td>
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<td>Laboratory Studies of the unit operations of chemical engineering with emphasis on momentum and heat transfer. Fee. Pre-requisite: CHE 322 Minimum Grade of C and CHE 342 Minimum Grade of C and CHE 351 Minimum Grade of C and CHE 352 Minimum Grade of C.</td>
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<tr>
<td>CHE 442</td>
<td>Chem Engr Ops Lab II - W</td>
<td>2 cr</td>
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<td>Laboratory studies of the unit operations of chemical engineering with emphasis on stage-wise and differential contactors. Fee. Pre-requisite: CHE 441 Minimum Grade of C and CHE 311 Minimum Grade of C and CHE 421 Minimum Grade of C. CHE 441 can be taken concurrently with this course.</td>
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<tr>
<td>CHE 451</td>
<td>Process Models</td>
<td>3 cr</td>
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<td>Mathematical modeling, simulation, and dynamics of chemical process systems for design and analysis. Fee. Pre-requisite: CHE 322 Minimum Grade of C.</td>
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<tr>
<td>CHE 452</td>
<td>Process Dynamics and Control</td>
<td>3 cr</td>
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<tr>
<td>CHE 461</td>
<td>Process Design I</td>
<td>3 cr</td>
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<td>Engineering economics and elements of process design, including energy and material balances, manufacturing and product cost. Unit operation equipment sizing, and cost. This course is considered a &quot;Senior Capstone Design&quot; course. Fee. Pre-requisite: EG 231 Minimum Grade of C and CHE 332 Minimum Grade of C and CHE 342 Minimum Grade of C and CHE 372 Minimum Grade of C.</td>
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<tr>
<td>CHE 462</td>
<td>Process Design II</td>
<td>3 cr</td>
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<td>Selection, design and specification of principal chemical processes. This course is considered a &quot;Senior Capstone Design&quot; course. Fee. Pre-requisite: CHE 461 Minimum Grade of C.</td>
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<tr>
<td>CHE 463</td>
<td>Simulation of Chemical Process</td>
<td>3 cr</td>
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<td>In this course, students utilize modern software tools, such as Aspen Plus, to model steady rate chemical processes. Simulation topics include physical property selection, flowsheet generation, separations, and reactors. Fee. Pre-requisite: CHE 311 Minimum Grade of C and CHE 332 Minimum Grade of C and CHE 372 Minimum Grade of C.</td>
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<tr>
<td>CHE 490</td>
<td>Special Topics</td>
<td>1 TO 3 cr</td>
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<td>Topics of current chemical engineering interest. Requires consent of department chair or departmental approval. Fee.</td>
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<tr>
<td>CHE 494</td>
<td>Directed Studies</td>
<td>1 TO 3 cr</td>
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<td>Directed study, under the guidance of a faculty advisor, of a topic from the field of chemical engineering, not offered in a regularly scheduled course. A written report is required. May be repeated for a maximum of 6 credit hours. Requires consent of the department chair and minimum GPA of 3.00 for admission or departmental approval. Fee.</td>
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<tr>
<td>CHE 499</td>
<td>Honors Senior Project</td>
<td>1 TO 6 cr</td>
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<td>Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of chemical engineering. The senior project will be judged and graded by three faculty chaired by the honors mentor. This course is required for Honors recognition. A minimum of 4 credit hours is required, but students may enroll for a maximum of 6 credit hours over two semesters. Requires completion of an approved project prospectus. Pre-requisite: CHE 322 Minimum Grade of C and CHE 332 Minimum Grade of C. CHE 441 Minimum Grade of C. CHE 442 Minimum Grade of C.</td>
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<tr>
<td>CHE 501</td>
<td>Chemical Engineering Seminar</td>
<td>0 TO 1 cr</td>
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<td>A weekly research seminar for Chemical Engineering graduate students. Students will attend research presentations by faculty, invited speakers and other students rehearsing for their proposal presentations, thesis defenses or conference presentations. Topics will include research, research methods, safety and responsible conduct of research.</td>
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</table>
CHE 510  Adv Chemical Thermodynamics  3 cr
Advanced classical and molecular thermodynamics as applied to non-ideal multicomponent phase and reaction equilibria for chemical engineering applications. An introduction to statistical thermodynamics will also be given. Fee.

CHE 520  Adv Transport Phenomena I  3 cr
An advanced treatment of the principles and methods of transport phenomena. Detailed coverage of several key aspects of energy and momentum transfer including creeping flows, boundary layers and lubrication theory.

CHE 521  Adv Transport Phenomena II  3 cr
An advanced treatment of the principles and methods of mass transfer, diffusion and adsorption phenomena. Coverage of conservation equations, mass transfer at interfaces and boundary conditions. Includes coverage of adsorption and diffusion on surfaces, porous structures and membranes.

CHE 525  Chemical Reactor Analysis  3 cr
Design, modeling and analysis of non-ideal chemical reactor systems. Includes effects of mass transfer in heterogeneous catalytic reactors, non-steady-state heat transfer and residence time distributions.

CHE 530  Synthetic Fuels  3 cr
Fundamentals of gasification and liquefaction concepts applied to fossil fuels and biomass conversion.

CHE 550  Chemical Process Control  3 cr
Sampled-data algorithms, feedback, feedforward, deadtime compensation, advanced control schemes applied to chemical engineering processes. Fee.

CHE 551  Adv Chem Engineering Modeling  3 cr
Advanced mathematical modeling of chemical process systems for design and analysis.

CHE 563  Simulation of Chem Processes  3 cr
In this course, students utilize modern software, tools, such as Aspen Plus, to model steady state chemical processes. Simulation topics include physical property selection, flowsheet generation, separations and reactors. Fee.

CHE 570  Separation Processes  3 cr
Analysis and design of separation processes. Topics include molecular diffusion and convective mass transfer with applications in the chemical, petroleum and pharmaceutical industries. Fee.

CHE 575  Chem Proc Synth Optimization  3 cr
Use of analysis, synthesis, and optimization in process development. Fee.

CHE 580  Chem Process Safety and Design  3 cr
Fundamental principles of chemical process safety, fires and explosions and design for the mitigation of associated hazards. Fee.

CHE 590  Special Topics -  3 cr
Topics of current chemical engineering interest. Requires consent of the department chair or departmental approval. Fee.

CHE 592  Directed Independent Study  1 TO 6 cr
Directed study, under the guidance of a faculty advisor, of a topic from the field of chemical engineering, not offered in a regularly scheduled course. A written report is required. Requires consent of the department chair and overall minimum GPA of 2.5 for admission or departmental approval. Fee.

CHE 594  Project in Chem Engineering  3 cr
Approved investigation of original problems under direction of a faculty member. Requires approved prospectus. Fee.

CHE 599  Thesis  1 TO 6 cr
May be taken more than once. Only 6 hours may be applied for credit toward a degree. Requires approved prospectus. Fee.

Chemistry (CH)

CH 101L  Survey Inorg-Org Chem Lab  1 cr
Laboratory exercises associated with CH 101. CH 101 must be taken concurrently or as a prerequisite. Together, CH 101 and CH 101L count as one laboratory science course, partially fulfilling general education requirements. Fee. Core Course.
Co-requisite: CH 101

CH 103L  Chemistry-Its Role Society Lab  1 cr
Laboratory exercises associated with CH 103. CH 103 must be taken concurrently or as a prerequisite. Together, CH 103 and CH 103L count as one laboratory science course, partially fulfilling general education requirements. Fee. Core course.
Co-requisite: CH 103
Pre-requisite: CH 103 Minimum Grade of D or CH 105 Minimum Grade of D. CH 103 can be taken concurrently with this course.

CH 131L  General Chemistry I Lab  1 cr
Laboratory exercises associated with CH 131. CH 131 and CH 131L count as one laboratory science course, partially fulfilling general education requirements. Fee. Core course.
Pre-requisite: CH 100 Minimum Grade of D or CH 110 Minimum Grade of D or ACT Math 24 or SAT Mathematics 590 or MA 112 Minimum Grade of C or MA 113 Minimum Grade of C or MA 172 Minimum Grade of C or MA 115 Minimum Grade of C or MA 121 Minimum Grade of C or MA 120 Minimum Grade of C or MA 287 Minimum Grade of C or MA 125 Minimum Grade of C or MA 132 Minimum Grade of C or MA 126 Minimum Grade of C or MA 233 Minimum Grade of C or MyMathTest 080 or University test - Math 85 .
CH 132L  General Chemistry II Lab  1 cr
Laboratory exercises associated with CH 132. CH 132 must
be taken concurrently or as a prerequisite. Together, CH
132 and CH 132L count as one laboratory science course,
partially fulfilling general education requirements. Fee. Core
course.
Pre-requisite: CH 131 Minimum Grade of D and CH 131L
Minimum Grade of D.

CH 201L  Organic Chemistry I Lab  1 cr
Laboratory exercises associated with CH 201. (Offered
Fall and Spring Semesters.) The laboratory introduces
basic organic laboratory practices such as the collection
of physical properties data, separation and purification
techniques, synthesis, and spectroscopic methods. CH 201
must be taken concurrently or as a prerequisite. Fee.
Co-requisite: CH 201
Pre-requisite: ((CH 116 Minimum Grade of D) or (CH 132
Minimum Grade of D and CH 132L Minimum Grade of D)).

CH 202L  Organic Chemistry II Lab  1 cr
Laboratory exercises associated with CH 202. The
laboratory continues with the basic organic laboratory
practices with additional synthetic methods. (Offered Fall
and Spring Semesters.) CH 202 must be taken concurrently
or as a prerequisite. Fee.
Co-requisite: CH 202
Pre-requisite: (CH 222 Minimum Grade of D) or (CH 201
Minimum Grade of D and CH 201L Minimum Grade of D).

CH 265L  Introductory Analysis Lab  1 cr
Laboratory exercises associated with CH 265. (Offered Fall
and Spring Semesters.) CH 265 must be taken concurrently
or as a prerequisite. Fee.
Co-requisite: CH 265
Pre-requisite: (CH 116 Minimum Grade of D or (CH 132
Minimum Grade of D and CH 132L Minimum Grade of D)).

CH 300L  Phys Chem for Life Sci Lab-W  1 cr
Laboratory exercises associated with CH 300. (Offered
Fall Semester.) CH 300 must be taken concurrently or as a
prerequisite. Fee.
Co-requisite: CH 300
Pre-requisite: (CH 265 Minimum Grade of D and CH 265L
Minimum Grade of D) or (CH 266 Minimum Grade of D and
MA 126 Minimum Grade of D or MA 223 Minimum Grade of D) and (PH 202 Minimum Grade of D or PH 217 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) or (MA 227 Minimum Grade of D or MA 234 Minimum Grade of D and PH 115 Minimum Grade of D). PH 202 and MA 227 and MA 234 can be taken concurrently with this course.

CH 301L  Physical Chemistry I Lab-W  1 cr
Laboratory exercises associated with CH 301. (Offered Fall
Semester.) Lab is required for chemistry majors. Fee.
Co-requisite: CH 301
Pre-requisite: (CH 265 Minimum Grade of D or CH 266
Minimum Grade of D) and (MA 126 Minimum Grade of D
or MA 223 Minimum Grade of D) and (PH 202 Minimum
Grade of D or PH 217 Minimum Grade of D) or MA 227
Minimum Grade of D or (MA 234 Minimum Grade of D and
PH 115 Minimum Grade of D) or PH 113 Minimum Grade of D and (EH 102 Minimum Grade of C or EH 105 Minimum
Grade of C). PH 202 and MA 227 and MA 234 can be taken concurrently with this course.

CH 302L  Physical Chemistry II Lab - W  1 cr
Laboratory exercises associated with CH 302. (Offered
Spring Semester.) Lab is required for chemistry majors. Fee.
Co-requisite: CH 302
Pre-requisite: ((EH 102 Minimum Grade of C or EH 105
Minimum Grade of C) and (CH 222 Minimum Grade of D) or
(CH 223 Minimum Grade of D) or (MA 126 Minimum Grade of D) and (CH 265 Minimum Grade of D) and (MA 227 Minimum Grade of D) or MA 223 Minimum Grade of D) and (PH 202 Minimum Grade of D or PH 217 Minimum Grade of D) or MA 227 Minimum Grade of D or MA 234 Minimum Grade of D and (PH 115 Minimum Grade of D or PH 113 Minimum Grade of D). PH 202 and MA 227 and MA 234 can be taken concurrently with this course.

CH 401L  Intermed Inorganic Chem Lab  2 cr
Laboratory exercises associated with CH 401. (Offered
Spring Semester). Fee.
Co-requisite: CH 401
Pre-requisite: (CH 301 Minimum Grade of D and CH 301L
Minimum Grade of D) or CH 332 Minimum Grade of D and
(CH 302 Minimum Grade of D and CH 302L Minimum Grade of D) or CH 333 Minimum Grade of D.

CH 414L  Environmental Chemistry Lab  1 cr
Laboratory exercises associated with CH 414. Real-
world examples will be used to learn appropriate isolation
techniques followed by chemical and instrumental analysis.
CH 414 must be taken concurrently. (Offered in Fall
Semester.) Fee.
Co-requisite: CH 414
Pre-requisite: (CH 201 Minimum Grade of D or CH 222
Minimum Grade of D) or (CH 265 Minimum Grade of D or
CH 266 Minimum Grade of D).

CH 465L  Instrumental Analysis Lab  2 cr
Laboratory exercises associated with CH 465. (Offered Fall
Semester.) Fee.
Co-requisite: CH 465
Pre-requisite: (CH 265 Minimum Grade of D and CH 265L
Minimum Grade of D) or CH 266 Minimum Grade of D and
(CH 300 Minimum Grade of D and CH 300L Minimum
Grade of D) or (CH 302 Minimum Grade of D and CH 302L
Minimum Grade of D) or CH 333 Minimum Grade of D) or
((CH 301 Minimum Grade of D and CH 301L Minimum
Grade of D) or CH 332 Minimum Grade of D).
CH 514L  Environmental Chemistry Lab  1 cr
Laboratory exercises associated with CH 514. Real-world samples will be used to learn appropriate isolation techniques followed by chemical and instrumental analysis. CH 514 must be taken concurrently. (Offered in Fall Semester.) Fee.
Co-requisite: CH 514
Pre-requisite: (CH 202 Minimum Grade of D or CH 223 Minimum Grade of D).

CH 565L  Instrumental Analysis Lab  2 cr
Laboratory exercises associated with CH 565. (Offered Fall Semester.) Requires Graduate status. Fee.
Pre-requisite: ( (CH 265 Minimum Grade of D and CH 265L Minimum Grade of D) or CH 266 Minimum Grade of D ) and (CH 300 Minimum Grade of D and CH 300L Minimum Grade of D) or ( (CH 302 Minimum Grade of D and CH 302L Minimum Grade of D) or CH 333 Minimum Grade of D) or ( (CH 301 Minimum Grade of D and CH 301L Minimum Grade of D) or CH 332 Minimum Grade of D).

CH 101  Survey of Inorg and Org Chem  3 cr
An intensive presentation of inorganic and organic chemistry principles selected to convey a basic understanding of their relationship to and function in the life process. Laboratory exercises will introduce students to basic laboratory procedures, often using exercises related to life process. This course is generally taken by students in the College of Nursing. CH 101L must be taken concurrently. Together, CH 101 and CH 101L count as one laboratory science course, partially fulfilling general education requirements. (Offered Fall and Spring Semesters.) Core Course.
Co-requisite: CH 101L

CH 103  Chemistry-Its Role in Society  3 cr
Chemical principles to allow understanding of the technical aspects of air and water pollution, chemical solutions of the energy crisis, the polymer industry, drugs, nutrition, and genetic engineering. CH 103 is not designed to lead to other chemistry courses and may not be used to substitute for CH 131 for students majoring or minoring in Chemistry. CH 103L must be taken concurrently. Together, CH 103 and CH 103L count as one laboratory science course, partially fulfilling general education requirements. (Offered Fall and Spring Semesters) Core course.
Co-requisite: CH 103L

CH 131  General Chemistry I  3 cr
First of a two-semester sequence for majors, minors, and others seeking quantitative treatment. Topics include the nuclear model, stoichiometry, chemical reactions, gas laws, thermochemistry, atomic structure, and molecular bonding. CH 131 and CH 131L must be taken concurrently. Together, CH 131 and CH 131L count as one laboratory science course partially fulfilling general education requirements. (Offered Fall and Spring Semesters) Requires CH 100 or ACT Math score of 24 or greater (or its equivalent as determined by the University) or letter grade of C or higher in MA 112 (or any higher level MA experience) or a score of 80 or greater on the Mathematics Placement Test and the completion of a high school physical science unit (or its equivalent) or one term of college chemistry. Core Course.
Pre-requisite: CH 100 Minimum Grade of D or CH 110 Minimum Grade of D or ACT Math 24 or SAT Mathematics 590 or MA 112 Minimum Grade of C or MA 113 Minimum Grade of C or MA 172 Minimum Grade of C or MA 115 Minimum Grade of C or MA 121 Minimum Grade of C or MA 120 Minimum Grade of C or MA 287 Minimum Grade of C or MA 125 Minimum Grade of C or MA 132 Minimum Grade of C or MA 126 Minimum Grade of C or MA 233 Minimum Grade of C or MyMathTest 080 or University test - Math 85 .

CH 132  General Chemistry II  3 cr
Continuation of CH 131. Topics include solutions, colligative properties, chemical kinetics, equilibrium, acids and bases, pH, buffers, titrations, thermodynamics, and electrochemistry. Additional topics may include nuclear chemistry, organic and biochemistry, chemistry of inorganic compounds, transition metal complexes, and industrial chemistry. Both the lecture and laboratory experiences of CH 131 (General Chemistry I) are prerequisites. CH 132L must be taken concurrently. Together, CH 132 and CH 132L count as one laboratory science course, partially fulfilling general education requirements. (Offered Fall and Spring Semesters.) Core Course.
Pre-requisite: CH 115 Minimum Grade of D or (CH 131 Minimum Grade of D and CH 131L Minimum Grade of D).

CH 150  Intro to Computer Chemistry  2 cr
This course will introduce the student to direct application and use of computer activity for applications in chemistry; acquisition of data from instrumentation, data analysis, presentation of experimental data, and chemical structure and modeling programs. Fee.
Pre-requisite: (CH 115 Minimum Grade of D or (CH 131 Minimum Grade of D and CH 131L Minimum Grade of D) or (CH 141 Minimum Grade of D and CH 141L Minimum Grade of D) ) and ( (MA 113 Minimum Grade of D or MA 172 Minimum Grade of D) or (MA 115 Minimum Grade of D or MA 121 Minimum Grade of D) or (MA 125 Minimum Grade of D or MA 132 Minimum Grade of D) or (MA 126 Minimum Grade of D or MA 233 Minimum Grade of D) ).
CH 141 and CH 141L can be taken concurrently with this course.
CH 201 Organic Chemistry I 3 cr
Fundamentals of structure and chemical behavior of organic molecules including nomenclature, properties, structure, stereochemistry, spectroscopy (both infrared and nuclear magnetic resonance), reactions, synthesis, and mechanisms of alkanes, alkenes, alkyl halides, and alcohols. (Offered Fall and Spring Semesters). CH 201L must be taken concurrently.
Co-requisite: CH 201L
Pre-requisite: CH 116 Minimum Grade of D or (CH 132 Minimum Grade of D and CH 132L Minimum Grade of D) or (CH 141 Minimum Grade of D and CH 141L Minimum Grade of D).

CH 202 Organic Chemistry II 3 cr
Continuation of study of structure and chemical behavior of organic molecules including aromatic compounds, ketones and aldehydes amines, carboxylic acids and their derivatives, carbohydrates, amino acids, peptides and proteins, nucleic acids, alkenes, ethers and epoxides, and conjugated dienes. (Offered Fall and Spring Semesters.) CH 202L must be taken concurrently. Fee.
Co-requisite: CH 202L
Pre-requisite: (CH 201 Minimum Grade of D and CH 201L Minimum Grade of D) or CH 222 Minimum Grade of D.

CH 265 Introductory Analysis 3 cr
A detailed study of the fundamental theories and principles of chemistry with emphasis on their application to quantitative analysis. Because proficiency of the material covered in CH 132 is vital for success in this course, students are strongly advised to take the two courses as close together as schedules permit. (Offered Fall and Spring Semesters.)
Co-requisite: CH 265L
Pre-requisite: (CH 116 Minimum Grade of D or (CH 132 Minimum Grade of D and CH 132L Minimum Grade of D) or (CH 141 Minimum Grade of D and CH 141L Minimum Grade of D).

CH 300 Physical Chem for Life Sci 3 cr
Designed to introduce the concepts of physical chemistry to students interested in the biochemical and biological aspects of chemistry. Topics are presented from viewpoint of their applications to biochemical problems; thermodynamics/biochemical energetics, properties of solutions, biological redox reactions, chemical/enzyme kinetics. (Offered Fall Semester.) CH 300L must be taken concurrently.
Co-requisite: CH 300L
Pre-requisite: ( (CH 265 Minimum Grade of D and CH 265L Minimum Grade of D) or CH 266 Minimum Grade of D ) and (MA 126 Minimum Grade of D or MA 233 Minimum Grade of D) and (PH 202 Minimum Grade of D or PH 217 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CH 301 Physical Chemistry I 3 cr
Co-requisite: CH 301L
Pre-requisite: ( (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (CH 265 Minimum Grade of D and CH 265L Minimum Grade of D) or CH 266 Minimum Grade of D) and (MA 126 Minimum Grade of D or MA 233 Minimum Grade of D) and (PH 202 Minimum Grade of D or PH 217 Minimum Grade of D) or (MA 227 Minimum Grade of D or MA 234 Minimum Grade of D) and (PH 115 Minimum Grade of D or PH 113 Minimum Grade of D). PH 202 and MA 227 and MA 234 can be taken concurrently with this course.

CH 302 Physical Chemistry II 3 cr
Quantum Theory and Applications to Atoms and Molecules, Spectroscopy, and Statistical Thermodynamics. (Offered Spring Semester.) Required for chemistry majors.
Co-requisite: CH 302L
Pre-requisite: ( (CH 265 Minimum Grade of D and CH 265L Minimum Grade of D) or CH 266 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (MA 126 Minimum Grade of D or MA 223 Minimum Grade of D) and (PH 202 Minimum Grade of D or PH 217 Minimum Grade of D) or (MA 227 Minimum Grade of D or MA 234 Minimum Grade of D) and (PH 115 Minimum Grade of D or PH 113 Minimum Grade of D). PH 202 and MA 227 and MA 234 can be taken concurrently with this course.

CH 394 Directed Studies - 1 TO 4 cr
Student works in a research laboratory under faculty guidance. May be repeated; sum of all directed studies cannot exceed eight (8) credits. Requires Junior standing or permission of Department Chair.

CH 401 Interm Inorganic Chemistry 3 cr
Atomic and molecular structure and bonding emphasizing the use of symmetry, group theory, and molecular orbitals; NMR spectrometry; coordination chemistry; organometallic chemistry and homogeneous catalysis. (Offered Spring Semester).
Co-requisite: CH 401L
Pre-requisite: (CH 301 Minimum Grade of D and CH 301L Minimum Grade of D) and (CH 302 Minimum Grade of D and CH 302L Minimum Grade of D) or (CH 303 Minimum Grade of D).

CH 403 Bioinorganic Chemistry 3 cr
Survey of bioorganic chemistry appropriate for upper-level undergraduate and beginning graduate students. The approach will be molecular and chemical in nature with a focus on the study of the non-carbon elements, especially the transition metals, as related to biological activity. (Offered Fall Semester). Recommended: CH 301, CH 302, or CH 440. Fee.
Pre-requisite: CH 202 Minimum Grade of D or CH 223 Minimum Grade of D.
### CH 414 Environmental Chemistry 3 cr
Introduces the cycling of elements in the earth as groundwork for understanding the chemical reactions and fate of chemical species introduced as contaminants to the environment. The chemistry of natural and anthropogenic contaminants in the atmosphere, the hydrosphere, the lithosphere and the transport and transformation of chemical species in the environment are discussed. CH 414L must be taken concurrently. (Offered in Fall Semester.)
Co-requisite: CH 414L
Pre-requisite: (CH 201 Minimum Grade of D or CH 222 Minimum Grade of D) and (CH 265 Minimum Grade of D or CH 266 Minimum Grade of D).

### CH 440 Biochemistry I 3 cr
Study of fundamental biochemical concepts; emphasis is placed on protein, carbohydrate, and lipid structures as related to their functional behavior; enzyme kinetics and mechanisms of action; thermodynamic relationships in biochemical systems. (Offered Fall Semester). Cross-listed with BLY 440.
Pre-requisite: (CH 202 Minimum Grade of D or CH 223 Minimum Grade of D).

### CH 441 Biochemistry II 3 cr
Study of the reaction and regulations of intermediary metabolism; the biochemistry of genetic systems to include regulatory mechanisms and protein synthesis. (Offered Spring Semester). Cross-listed with CH 440 Minimum Grade of D or BLY 440 Minimum Grade of D.

### CH 443 Lab Studies in Biochemistry 2 cr
Course familiarizes the student with the basic laboratory techniques commonly employed in biochemical research. (Offered Spring Semester). Cross-listed with CH 440 Minimum Grade of D or BLY 440 Minimum Grade of D.

### CH 445 Instrumental Analysis 3 cr
Modern analytical instruments, their operating principles, and their applications. (Offered Fall Semester).
Co-requisite: CH 465L
Pre-requisite: (CH 265 Minimum Grade of D and CH 266 Minimum Grade of D) or (CH 300 Minimum Grade of D and CH 300L Minimum Grade of D) or (CH 302 Minimum Grade of D and CH 302L Minimum Grade of D) or (CH 333 Minimum Grade of D) or (CH 301 Minimum Grade of D and CH 301L Minimum Grade of D) or (CH 332 Minimum Grade of D).

### CH 470 Computational Chemistry 4 cr
Designed to provide an introduction to some of the techniques used in molecular modeling and computational chemistry, and to illustrate how these techniques can be used to study physical, chemical and biological phenomena. Topics: quantum mechanical methods, empirical force fields, molecular mechanics and dynamics, Monte Carlo, continuum electrostatics, and free energy perturbation methods. (Offered Spring Semester). Permission of instructor.
Pre-requisite: (CH 132 Minimum Grade of D and CH 132L Minimum Grade of D) or (CH 141 Minimum Grade of D and CH 141L Minimum Grade of D) and CH 202 Minimum Grade of D.

### CH 490 Sp Top - 1 TO 4 cr
Study of a significant topic in Chemistry. May be repeated for a maximum of four credits when the content varies. Requires Senior standing.

### CH 492 Seminar I 1 cr
Information retrieval from scientific references, journals, and on-line databases directed toward computer-based preparation of a student seminar having as the capstone experience a formal seminar for Department Faculty and students. (Offered Spring Semester). Requires Senior standing or permission of Department Chair. Fee.

### CH 493 Seminar II 1 cr
Continuation of CH 492. Taken the next semester registered after successful completion of CH 492 unless special permission granted by the Department Chair. Presentation of a formal seminar for Department Faculty and students. (Offered Fall and Spring Semesters). Requires Senior standing or permission of Department Chair.
Pre-requisite: CH 492 Minimum Grade of D.

### CH 494 Directed Studies 1 TO 4 cr
Student works in a research laboratory under faculty guidance. May be repeated; sum of all directed studies cannot exceed eight (8) credits. Requires Senior standing or permission of Department Chair.

### CH 499 Sr Honors Chemistry Project-H 3 cr
Student research under faculty direction; written report and oral presentation of research work to faculty and students. This course may be repeated once for a maximum of six credits. Requires permission of department chair.

### CH 514 Environmental Chemistry 3 cr
Introduces the cycling of elements in the earth as groundwork for understanding the chemical reactions and fate of chemical species introduced as contaminants to the environment. The chemistry of natural and anthropogenic contaminants in the atmosphere, the hydrosphere, the lithosphere and the transport and transformation of chemical species in the environment are discussed. CH 514L must be taken concurrently. (Offered in Fall Semester.)
Co-requisite: CH 514L
Pre-requisite: (CH 202 Minimum Grade of D or CH 223 Minimum Grade of D).
CH 515  Environmental Toxicology  3 cr
Introduction to the scientific and technical principles of toxicological processes in the context of the ecosystem. Students will understand both the types of major environmental toxicants and how to properly evaluate their toxicity and factors that influence toxicity. Students will recognize and coherently formulate risk assessment and by using the tools and techniques acquired, develop and communicate proposals for remedy.

CH 521  Marine Nat Product Chemistry  3 cr
Chemical-physical analysis and synthesis of alkaloids, antibiotics, algae and bacterial metabolites, plant pigments, steroids, and terpenes found in the marine environment. (Offered as required.) Requires Graduate status. Fee. Pre-requisite: (CH 202 Minimum Grade of D or CH 223 Minimum Grade of D).

CH 530  Biochem of Marine Organism  3 cr
Study of biochemical regulatory processes associated with energy production, vision, defense mechanisms and other physiological activities within vertebrate and invertebrate species of the marine environment. (Offered as required.) Requires Graduate status.

CH 540  Biochemistry I  3 cr
Study of fundamental biochemical concepts; emphasis is placed on protein, carbohydrate, and lipid structures as related to their functional behavior, enzyme kinetics and mechanisms of action; thermodynamic relationships in biochemical systems. (Offered Fall Semester.) Requires Graduate status. Cross-listed with BLY 540. Pre-requisite: (CH 202 Minimum Grade of D or CH 223 Minimum Grade of D).

CH 541  Biochemistry II  3 cr
Study of the reactions and regulations of intermediary metabolism; the biochemistry of genetic systems to include regulatory mechanisms and protein synthesis. (Offered Spring Semester.) Requires Graduate status. Cross-listed with BLY 541. Pre-requisite: CH 540 Minimum Grade of B or BLY 540 Minimum Grade of B.

CH 543  Lab Studies in Biochemistry  2 cr
Course familiarizes the student with the basic laboratory techniques commonly employed in biochemical research. (Offered Spring Semester.) Requires Graduate status. Cross-listed with BLY 543. Fee. Pre-requisite: CH 441 Minimum Grade of D or CH 540 Minimum Grade of B or CH 541 Minimum Grade of B. CH 441 and CH 541 can be taken concurrently with this course.

CH 550  Readings in Marine Chemistry  3 cr
Readings of primary literature on topics of special interest in the area of marine chemistry and biochemistry. Offered as required. Requires Graduate status. Fee.

CH 565  Instrumental Analysis  3 cr
Modern analytical instruments, their operating principles, and their applications. (Offered Fall Semester). Requires Graduate status. Pre-requisite: (CH 265 Minimum Grade of D and CH 265L Minimum Grade of D) or CH 266 Minimum Grade of D) and (CH 300 Minimum Grade of D and CH 300L Minimum Grade of D) or (CH 302 Minimum Grade of D and CH 302L Minimum Grade of D) or (CH 301 Minimum Grade of D and CH 301L Minimum Grade of D) or (CH 333 Minimum Grade of D) or (CH 332 Minimum Grade of D) or (CH 331 Minimum Grade of D).

CH 570  Computational Chemistry  4 cr
Designed to provide an introduction to some of the techniques used in molecular modeling and computational chemistry, and to illustrate how these techniques can be used to study physical, chemical, and biological phenomena. Topics: quantum mechanical methods, empirical force fields, molecular mechanics and dynamics, Monte Carlo, continuum electrostatics, and free energy perturbation methods. (Offered as required.) Requires Graduate status. Fee. Pre-requisite: (CH 116 Minimum Grade of C or CH 132 Minimum Grade of C or CH 141 Minimum Grade of C) and (CH 202 Minimum Grade of C or CH 223 Minimum Grade of C).

CH 590  Special Topics -  1 TO 4 cr
Study of a significant topic in chemistry. May be repeated for a maximum of four credits when the content varies. Requires Graduate status.

CH 592  Seminar  1 cr
The use of scientific references and journals retrieval. Library assignment may be directed toward preparation of student seminars which are scheduled concurrently. (Offered as required.) Requires Graduate status. Fee.

CH 594  Directed Studies-  1 TO 4 cr
Literature survey and research under senior staff guidance. May be repeated but not to exceed four credits. Fee.

Civil Engineering (CE)

CE 102  Intro to Civil Engineering  2 cr
Introduction to Civil Engineering as a profession and the issues facing today's Civil Engineers. Team work, freehand sketching and Computer Aided Design (CAD) will be introduced. Students will be introduced to powerful computational tools such as spreadsheets and MathCad and learn their application in Civil Engineering. Techniques of writing a successful research paper will also be presented. Pre-requisite: MA 113 Minimum Grade of D or MA 125 Minimum Grade of D.
CE 204  Surveying Fundamentals  2 cr
Applications of fundamental surveying techniques. Students will be introduced to the applications of Global Positioning Systems (GPS) and Geographical Information Systems (GIS) in Civil Engineering.
Co-requisite: CE 205
Pre-requisite: MA 113 Minimum Grade of C or MA 115 Minimum Grade of C or MA 125 Minimum Grade of C and CE 102 Minimum Grade of C. MA 125 can be taken concurrently with this course.

CE 205  Surveying Fundamentals Lab  1 cr
Students will collect field data and use state-of-the-art surveying and GPS equipment. Collected data will be used in Geographical Information Systems (GIS) software.
Co-requisite: CE 204
Pre-requisite: MA 113 Minimum Grade of C or MA 115 Minimum Grade of C or MA 125 Minimum Grade of C and CE 102 Minimum Grade of C. MA 125 can be taken concurrently with this course.

CE 314  CE Materials  3 cr
Study of Engineering Properties of Materials used in civil engineering including steel, concrete, asphalt, and timber.
Co-requisite: CE 315
Pre-requisite: EG 315 Minimum Grade of D.

CE 315  CE Materials Lab  1 cr
Study of experimental techniques used to evaluate engineering properties of materials. These techniques will be used to test materials used in civil engineering according to ASTM standards.
Co-requisite: CE 314
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C and EG 315 Minimum Grade of D.

CE 340  Soil Mechanics  3 cr
Co-requisite: CE 341
Pre-requisite: EG 315 Minimum Grade of D and (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D).

CE 341  Geotechnical Laboratory-W  1 cr
Soil identification and classification: experimental measurement of soil properties and technical reporting.
Co-requisite: CE 340
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and CE 340 Minimum Grade of D. CE 340 can be taken concurrently with this course.

CE 352  Intro to Transportation  3 cr
Principles of transportation engineering with emphasis on highways and traffic.
Pre-requisite: CE 204 Minimum Grade of C and CE 205 Minimum Grade of C and ST 315 Minimum Grade of C.

CE 353  Transp-Geometric Design  3 cr
Basic principles and techniques of highway design, including route layout, alignment, intersection design, and materials/earthwork estimation. Use of computer tools to generate and analyze highway designs.
Pre-requisite: CE 352 Minimum Grade of D.

CE 360  Water Resources Engineering I  2 cr
The application of fluid mechanics and other science and engineering disciplines in the development of structures, projects, and systems involving water resources. Introductions to open-channel flow, closed-conduit flow, hydraulic structures, hydraulic machinery, and groundwater flow. Fee.
Co-requisite: CE 367
Pre-requisite: EG 360 Minimum Grade of D.

CE 367  Hydraulics Laboratory - W  1 cr
Laboratory and field measurement of fluid and flow properties; hydraulic laboratory practice and model stimulation techniques.
Co-requisite: CE 360
Pre-requisite: EG 360 Minimum Grade of D or CE 365 Minimum Grade of D.

CE 370  Intro to Enviromental Eng  3 cr
Introduction to the fundamentals of water quality characterization, water pollution hazardous waste management, water and wastewater treatment, solid waste management, waste minimization and control.
Co-requisite: CE 374
Pre-requisite: CH 132 Minimum Grade of C and MA 238 Minimum Grade of D.

CE 374  Intro to Enviromental Eng Lab  1 cr
Introduction to specific physical, chemical, and microbiological methods of analysis common to environmental engineering; including laboratory and field measurement of water quality characteristics and interpretation of results.
Co-requisite: CE 370
Pre-requisite: CH 132 Minimum Grade of C and MA 238 Minimum Grade of D.

CE 384  Structural Analysis  3 cr
Analysis of statically determinate structures such as trusses, beams, and frames including the calculation of deflections. Introduction to analysis of indeterminate structures.
Co-requisite: CE 385
Pre-requisite: EG 315 Minimum Grade of D.

CE 385  Structural Analysis Lab  1 cr
Modeling and analysis of determinate and indeterminate structures. Use of state-of-the-art structural analysis software.
Co-requisite: CE 384
Pre-requisite: EG 315 Minimum Grade of D.
CE 410  Construction Engineering  3 cr
An introduction to the construction industry and the role of civil engineering in construction. Construction engineering methods including preparation of cost estimates, critical path scheduling and resource allocation. Instructor permission. Fee.

CE 412  Mgmt & Sustainability of C.I.  3 cr
Management and sustainability of Civil infrastructure is designed to present an overview of infrastructure engineering and management systems and to use project management, decision support tools, and life cycle costing tools in connection with infrastructure planning and assessment. Students will be presented with the understanding that achieving sustainability requires the consideration to meeting present and future human needs and respecting “triple bottom line: economic, social, and environmental goals. The course also provides a review of several important design and management tools to support sustainable development and communities.

CE 431  Civil Engineering Design I  2 cr
Introduction to the practice of civil engineering and the engineering design process. In depth consideration of ethical issues in engineering practice. Participation in engineering design teams for project planning, proposal development, and completion of a feasibility study. Written and oral presentations of results. Senior Capstone Course. Fee.
Pre-requisite: CE 352 Minimum Grade of D or CE 443 Minimum Grade of D or CE 460 Minimum Grade of D or CE 470 Minimum Grade of D or CE 480 Minimum Grade of D or CE 485 Minimum Grade of D. CE 352 and CE 443 and CE 460 and CE 470 and CE 480 and CE 485 can be taken concurrently with this course.

CE 432  Civil Engineering Design II  4 cr
A multidisciplinary development of a project involving analysis and design in Civil Engineering. Implementation of design concepts and methodologies from conception to final design. Completion of a comprehensive design project including cost estimates, oral and written presentation of results. A senior capstone course. Fee.
Pre-requisite: CE 431 Minimum Grade of D.

CE 440  Intro to Geotech Eng  3 cr
An Introduction to Geotechnical Engineering designed to provide tools to analyze geomechanical and geohydraulic problems associated with the design of foundations, retaining structures, slopes and other geotechnically related designs.
Pre-requisite: CE 340 Minimum Grade of D and CE 341 Minimum Grade of D. CE 340 can be taken concurrently with this course.

CE 442  Foundation Engineering  3 cr
Principles of foundation analysis, design and construction in engineering practice.
Pre-requisite: CE 443 Minimum Grade of D.

CE 443  Geotechnical Engineering  2 cr
An introduction to Geotechnical Engineering. Analysis of geomechanical and geohydraulic problems accompanying the design of foundations, retaining structures and slopes.
Pre-requisite: CE 340 Minimum Grade of D.

CE 452  Transportation Geometric Design  3 cr
This course will provide students with an understanding of the basic principles and techniques of highway design. This will include laying out potential routes, design of the alignment and intersections, and evaluation of earthwork requirements. The student should be able to understand and apply these principles to highway design problems. The student should also be able to use existing computer tools to generate and analyze designs. Upon completion, students should be prepared to work in the field of highway design. Fee.
Pre-requisite: CE 352 Minimum Grade of D.

CE 460  Water Resources Engineering II  3 cr
The application of hydrologic and hydraulic principles for hydrologic analysis, frequency analysis, flood routing, hydrologic simulation, urban hydrology, floodplain hydraulics, and coastal engineering.
Pre-requisite: CE 360 Minimum Grade of D and CE 367 Minimum Grade of D.

CE 466  Coastal and Harbor Eng  3 cr
An introduction to the principles of coastal hydraulic and sedimentary processes and the design of coastal and harbor works such as ship channels, marinas, jetties, breakwaters, groins, seawalls and beach nourishment projects.
Pre-requisite: CE 460 Minimum Grade of D. CE 460 can be taken concurrently with this course.

CE 470  Water-Wastewater Trtmnt Design  3 cr
Development of the principles of design for components of water supply and wastewater treatment facilities, including drinking water distribution and wastewater collection systems.
Pre-requisite: CE 471
Pre-requisite: CE 360 Minimum Grade of D and CE 370 Minimum Grade of D and CE 374 Minimum Grade of D.

CE 471  Water-Wastewater Design Lab  1 cr
Application of design principles and criteria to analyze, design, and evaluate water and wastewater treatment facility components, including water distribution and wastewater collection systems.
Pre-requisite: CE 360 Minimum Grade of D and CE 370 Minimum Grade of D and CE 374 Minimum Grade of D.

CE 474  Industrial Waste Treatment  3 cr
Topics in Industrial Waste Treatment unit processes and their design, including those addressing wastewater treatment, air pollution control, solid waste, and hazardous management.
Pre-requisite: CE 470 Minimum Grade of D.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
<th>Co-requisites</th>
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<tbody>
<tr>
<td>CE 480</td>
<td>Design of Steel Structures</td>
<td>3 cr</td>
<td>Design of Steel Trusses, Girders, Building Frames, and other Steel Structures.</td>
<td>Co-requisite: CE 481 Pre-requisite: CE 384 Minimum Grade of D and CE 314 Minimum Grade of D and CE 315 Minimum Grade of D.</td>
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<tr>
<td>CE 481</td>
<td>Steel Design Lab</td>
<td>1 cr</td>
<td>Application of structural steel design methods to specific cases.</td>
<td>Co-requisite: CE 480 Pre-requisite: CE 384 Minimum Grade of D and CE 314 Minimum Grade of D and CE 315 Minimum Grade of D.</td>
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<tr>
<td>CE 482</td>
<td>Timber Design</td>
<td>3 cr</td>
<td>This course will cover the design of timber structures. Design loads, structural behavior, properties and grades of wood will be covered. Design of beams, columns, diaphragms, shearwalls, structural glued laminated timber, and structural connections. Instructor Approval Required Pre-requisite: CE 384 Minimum Grade of D and CE 385 Minimum Grade of D.</td>
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<tr>
<td>CE 486</td>
<td>Reinforced Concrete Design Lab</td>
<td>1 cr</td>
<td>Integrated reinforced concrete design problems similar to those found in practice will be presented. Students will solve similar problems in class during the lab period. Co-requisite: CE 485 Pre-requisite: CE 384 Minimum Grade of D and CE 314 Minimum Grade of D and CE 315 Minimum Grade of D.</td>
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<tr>
<td>CE 490</td>
<td>Special Topics</td>
<td>1 TO 4 cr</td>
<td>Topics of current civil engineering interest.</td>
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<tr>
<td>CE 494</td>
<td>Directed Studies</td>
<td>1 TO 4 cr</td>
<td>Directed study, under the guidance of a faculty advisor, of a topic from the field of civil engineering not offered in a regularly scheduled course. Requires department chair permission.</td>
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<tr>
<td>CE 499</td>
<td>Honors Senior Project</td>
<td>1 TO 6 cr</td>
<td>Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of Civil Engineering study, that will lead to a formal presentation at the Annual Honors Student Colloquium. The senior project will be judged and graded by three faculty, chaired by the honors mentor. This course is required for Honors recognition. A minimum of 4 credit hours is required, but a student may enroll for a maximum of 6 credit hours over two semesters. Prerequisites: Completion of the most advanced required course in the subdiscipline of the project (CE 440, CE 366, CE 470, or CE 384) and completion of an approved project prospectus. Pre-requisite: CE 352 Minimum Grade of C or CE 366 Minimum Grade of D or CE 384 Minimum Grade of C or CE 443 Minimum Grade of C or CE 470 Minimum Grade of C.</td>
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<tr>
<td>CE 501</td>
<td>Intro to Coastal Design Enviro</td>
<td>3 cr</td>
<td>An overview of the unique aspects of the design environment faced by civil engineers along the coast including water wave mechanics, coastal water levels, coastal circulations and mixing, coastal groundwater levels and flow, coastal sediment transport, and hurricane winds.</td>
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<tr>
<td>CE 502</td>
<td>Intro to CE Dsn-Coastal Enviro</td>
<td>3 cr</td>
<td>An introduction to the design of civil engineering infrastructure in the coastal environment including beaches, seawalls, revetments, bulkheads, piers, jetties, constructed wetlands, coastal bridges and roadways, hurricane resistant buildings, sewer outfalls and other environmental protection devices and coastal regulatory policy. Pre-requisite: CE 501 Minimum Grade of C.</td>
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<tr>
<td>CE 510</td>
<td>Construction Engineering</td>
<td>3 cr</td>
<td>An introduction to the construction industry and the role of civil engineering in construction. Construction engineering methods including preparation of cost estimates, critical path scheduling and resource allocation. Instructor permission required. Fee.</td>
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<tr>
<td>CE 512</td>
<td>Mgmt &amp; Sustainability of Infr</td>
<td>3 cr</td>
<td>This course is designed to present an overview of infrastructure systems and how to manage and maintain these systems. Project management, decision support tools, and life cycle costing tools will be presented, in connection with infrastructure planning and assessment. Infrastructure sustainability will also be addressed, particularly considering the &quot;triple bottom line&quot; of economic, social, and environmental goals. The course also provides a review of several important design and management tools to support sustainable development and communities. A course project is required.</td>
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CE 542  Foundation Engineering  3 cr
This course is to provide advanced knowledge of selected
gеоtесhісаl principles for analysis, design and construction
of a variety of foundations systems. This course is dually
listed with an equivalent 400 level course (CE 442). Fee.
Pre-requisite: CE 441 Minimum Grade of C and CE 443
Minimum Grade of C.

CE 547  Groundwater  3 cr
Principals of fluid flow through porous media, well
hydraulics. Ground water contamination, including principals
that govern fate, transport, and remediation. Fee.
Pre-requisite: CE 340 Minimum Grade of C and CE 470
Minimum Grade of C.

CE 551  Traffic Engineering  3 cr
This course will focus on traffic flow parameters and their
influence on roadway traffic conditions, with emphasis
on traffic data collection, traffic safety analysis, roadway
markings, traffic signs, traffic signal timing and signal
capacity analysis, and traffic management systems.
Pre-requisite: CE 352 Minimum Grade of C.

CE 552  Transportation Geometric Design  3 cr
This course will provide students with an understanding
of the basic principles and techniques of highway design.
This will include laying out potential routes, design of the
alignment and intersections, and evaluation of earthwork
requirements. The student should be able to understand
and apply these principles to highway design problems.
The student should also be able to use existing computer
tools to generate and analyze designs. Upon completion,
students should be prepared to work in the field of highway
design. This course is dually listed with an equivalent 400
level course (DE 452). Fee.
Pre-requisite: CE 352 Minimum Grade of C.

CE 553  Transportation Systems Evaluation  3 cr
This course will focus on concepts and principles of
transportation economic analysis, transportation costs
and benefits, user and nonuser consequences, methods
of evaluation of plans and projects, environmental impact
assessments, and transportation programming and
management. Requires Instructor Permission.

CE 560  Coastal Hydrodynamics  3 cr
Theory and analysis of advanced coastal and estuarine
hydrodynamics. Potential topics to be covered include: wave
mechanics; tidal dynamics; coastal and estuarine circulation;
and transport and mixing in coastal waters.
Pre-requisite: CE 501 Minimum Grade of C.

CE 563  Hydrodynamic Modeling  3 cr
Theory and application of numerical models to coastal
hydrodynamics. Potential topics to be covered include:
overview of numerical simulation techniques; wave
transformation processes; engineering wave models;
principles of circulation; and advanced circulation models.
Pre-requisite: CE 501 Minimum Grade of C.

CE 566  Coastal and Harbor Engineering  3 cr
Advanced principles of coastal hydraulic and sedimentary
processes and the design of coastal and harbor works
such as ship channels, marina, jetties, breakwaters, groins,
seawalls, and beach nourishment projects. This course is
dually listed with an equivalent 400 level course (CE 466).
Fee.
Pre-requisite: CE 460 Minimum Grade of C and CE 501
Minimum Grade of C.

CE 571  Biological Wastewater Treatment  3 cr
Theory, analysis and design criteria of biological treatment
systems for municipal and industrial wastewaters, including
suspended and attached growth processes in both the
aerobic and anaerobic environments.
Pre-requisite: CE 470 Minimum Grade of C.

CE 572  Physical Wastewater Treatment  3 cr
Advanced theory and applications in physical and chemical
wastewater treatment. Topics covered include mass
transfer optimization; chemical treatment of nutrient loads;
dissolved oxygen;

CE 574  Industrial Waste Treatment  3 cr
Topics in Industrial Waste Treatment unit processes and
their design, including those addressing waste water
treatment, air pollution, solid waste, and hazardous waste
management. This course is dually listed with an equivalent
400 level course (CE 474). Credit for both CE 474 and CE
574 is not permitted. Fee.
Pre-requisite: CE 470 Minimum Grade of C.

CE 579  Fundamentals of Environmental Engineering  3 cr
Fundamentals of water quality characterization, water
pollution, hazardous waste management, water and
wastewater treatment, solid waste management, and
waste minimization and control. This course includes a
comprehensive project in addition to the lecture class. Note:
This course is a core course for MS degree students in the
Environmental Toxicology Program and not intended for
Engineering Majors. Instructor Permission. (This course is
dual listed with CE 370.) Fee.
Pre-requisite: (CH 116 Minimum Grade of C or CH 132
Minimum Grade of C).

CE 580  Steel Design  3 cr
Design of steel trusses, girders, building frames, and
other steel structures. This course is dually listed with an
equivalent 400 level course (CE 480). Fee.
Co-requisite: CE 581
Pre-requisite: CE 384 Minimum Grade of C or CE 385
Minimum Grade of C.
CE 581  Steel Design Lab  1 cr  Application of structural steel design methods to specific cases. This course is dually listed with an equivalent 400 level course (CE 481). Fee.  
Co-requisite: CE 580  
Pre-requisite: CE 384 Minimum Grade of C and CE 385 Minimum Grade of C.

CE 582  Timber Design  3 cr  This course will cover the design of timber structures. Design loads, structural behavior, properties and grades of wood will be covered. Design of beams, columns, diaphragms, shearwalls, structural glued laminated timber, and structural connections. This course is dually listed with an equivalent 400 level course (CE 482). Instructor Approval Required.

CE 583  Advanced Steel Design  3 cr  This course covers the design of built-up members, composite beams, columns and floors. Design of advanced bolted and welded connections will also be covered. Students will use state-of-the-art software to model and design complex steel structures.  
Pre-requisite: CE 480 Minimum Grade of C or CE 481 Minimum Grade of C.

CE 584  Advanced Structural Analysis  3 cr  Students will be introduced to the analysis of indeterminate structures using classical and matrix methods. Students will also be introduced to advanced structural modeling techniques using state-of-the-art software. Fee.  
Pre-requisite: CE 384 Minimum Grade of C and CE 385 Minimum Grade of C.

CE 585  Concrete Design  3 cr  Fundamentals of reinforced concrete analysis and design. Design of beams, one-way slabs, short columns, and single footings. Calculations of cracking and deflection of beams. This course is dually listed with an equivalent 400 level course (CE 485). Fee.  
Co-requisite: CE 586  
Pre-requisite: CE 384 Minimum Grade of C or CE 385 Minimum Grade of C.

CE 586  Concrete Design Lab  1 cr  Integrated reinforced concrete design problems similar to those found in practice will be presented. Students will solve similar problems in class during the lab period. This course is dually listed with an equivalent 400 level course (CE 486). Fee.  
Co-requisite: CE 585  
Pre-requisite: CE 384 Minimum Grade of C and CE 385 Minimum Grade of C.

CE 587  Advanced Concrete Design  3 cr  Students will be introduced to the analysis and design of reinforced concrete footings, retaining walls, two-way floor systems, long columns, beams subjected to torsion and deep beams. Fee.  
Pre-requisite: CE 485 Minimum Grade of C and CE 486 Minimum Grade of C.

CE 588  Prestressed Concrete Design  3 cr  Students will be introduced to the concepts of prestressing, loss of prestress, design of prestressed beams, columns and slabs. Fee.  
Pre-requisite: CE 485 Minimum Grade of C and CE 486 Minimum Grade of C.

CE 590  Special Topics -  1 TO 4 cr  Topics of current civil engineering interest.

CE 592  Directed Independent Study -  1 TO 3 cr  Directed study, under the guidance of a faculty advisor, of a topic from the field of Civil Engineering not offered in a regularly scheduled course. Requires Instructor Permission. Fee.

CE 594  Projects in Civil Engineering  1 TO 3 cr  May be repeated for credit. Requires approved proposal and consent of director of engineering graduate studies. Fee.

CE 599  Thesis  1 TO 6 cr  Thesis research. May be taken more than once. Requires approved prospectus. Fee.

Classics (CLA)

CLA 103  Art History I  3 cr  A survey of art and architecture of Europe and the Near East from the prehistoric to the end of the Gothic era. Identical with ARH 103. Credit cannot be received for both CLA 103 and ARH 103. Fee. Core Course.

CLA 105  Encounter with the Humanities  3 cr  Introduction to the various disciplines within the humanities with emphasis on the role each plays in a liberal arts education. Identical with AIS 105. Credit cannot be received for both CLA 105 and AIS 105. Fee. Core Course.

CLA 110  Intro Anc Greek Roman Culture  3 cr  A survey of the history, literature, philosophy, religion, art architecture, sociology, and political institutions of the Greek and Roman world with readings in translation from major Greek and Latin authors.

CLA 240  Western Philosophy: Classical  3 cr  Survey of classical Greek philosophy. The philosophers surveyed may include Presocratic philosophers, Socrates, Plato, Aristotle, and Hellenistic philosophers. Fulfills the General Education Requirement. Identical with PHL 240. Credit cannot be received for both CLA 240 and PHL 240. Pre-requisite: CA 101 Minimum Grade of D.

CLA 290  Sp Top -  3 cr  Different figures, periods or topics of significance in Classics will be studied as announced. May be repeated, when content varies, for a total of six hours.
CLA 304 Ancient Greek Art Architecture 3 cr
Architecture, sculpture, and painting in Ancient Greece and the expansion and influence of Greek culture in the Ancient World. Pre-requisite: ARH 103 Minimum Grade of C or CLA 110 Minimum Grade of C.

CLA 306 Roman Art 3 cr
Roman Art: Architecture, sculpture, and painting in Ancient Rome and its empire. Fee. Pre-requisite: (ARH 103 Minimum Grade of C or CLA 103 Minimum Grade of C) or CLA 110 Minimum Grade of C.

CLA 310 Classical Mythology 3 cr
Through the disciplines of English and Philosophy, this course will provide an introduction to myths and to the literature that recounts the myths, legends, and folktales of ancient Greece and Rome. This course will also look at how different writers treat the material and why their treatments vary. Cross-listed with PHL 310, REL 310, and EH 310. Credit cannot be received for both CLA 310 and either PHL 310 or REL 310 or EH 310.

CLA 311 Classical Political Thought 3 cr
The course examines the central themes of classical Western political philosophy through the reading and discussing of the primary works of such thinkers as Plato, Aristotle, Augustine, and Aquinas. (Cross-listed as PHL 311 and PSC 311).

CLA 390 Sp Top - 3 cr
Different figures, periods or topics of significance in Classics will be studied as announced. May be repeated, when content varies, for a total of six hours.

CLA 402 Rhetoric: Ancient and Modern 3 cr
Readings in rhetorical theory, ancient and modern, are applied in specific writing assignments which encourage students to adopt a point of view and address a specific audience. Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.

CLA 454 Ancient Greek Culture 3 cr
Through the disciplines of History and Philosophy, ancient Greek culture, including its history, literature, philosophy, art and architecture will be examined. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CLA 455 Ancient Roman Culture 3 cr
Through the disciplines of History and Philosophy, ancient Roman culture, including its history, literature, philosophy, art and architecture will be examined. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CLA 492 Seminar - 3 cr
An in-depth investigation of figures, periods or topics in Classics for advanced undergraduates. May be repeated, when content varies, for a total of six hours.

CLA 494 Directed Studies 1 TO 3 cr
Directed research in Classics under the guidance of a member of the department. Credit according to the magnitude of the individual project. May be repeated, if content varies, for a total of three hours. Prerequisites: Junior or senior standing and approval of directing professor and department chair.

CLA 499 Honors Thesis -W 3 TO 6 cr
Extended research paper prepared under the direction of thesis advisor plus two-person committee selected by advisor in consultation with student. Prerequisites: The student must have developed a proposal for the thesis in consultation with the advisor, and received permission for the work from the committee. In addition, the student must be a senior major or minor, have completed the common core, and have at least 3.3 GPA in the Classics concentration of the Philosophy major. Credit for this course is only given as an addition to the hours required for the major. Pre-requisite: (PHL 120 and PHL 240 and PHL 245 and PHL 321 and PHL 461 and PHL 310 ) or (REL 310 or CLA 310 ). PHL 240 can be taken concurrently with this course.

CLA 594 Directed Studies 3 cr
Directed research in philosophy under the guidance of a member of the department. May be repeated, if content varies, for a total of six hours. Prerequisite: Graduate Student in Department conferring a Graduate Degree (hence not open to Philosophy majors in any Concentration in Philosophy.)
Clinical/Counseling Psychology (CCP)

**CCP 742 Advanced Psych Assessment 3 cr**
This course will offer an in-depth understanding of the assessment of complex cases, which includes both mental illness and physical disorders, as well as the impact of complex social issues, such as culture, ethnicity, and economic issues. The course covers topics pertaining to adults and children. The emphasis will be on the integration of nomothetic and empirical perspectives with idiographic approaches in an evidence-based assessment model. Topics covered will be assessing special populations (e.g., severely mentally ill, trauma, forensic, parents), therapeutic assessment, person-centered report writing, providing feedback, theoretical and scientific issues in assessment, and current controversies.
Pre-requisite: CCP 706 Minimum Grade of B. CCP 706 can be taken concurrently with this course.

**CCP 745 Teaching of Psychology 3 cr**
This course will offer an in-depth understanding of the teaching of psychology at the post secondary level.

**CCP 750 Applied Psychophys Biofeedback 3 cr**
This course will survey theory, research, and applications of psychophysiology and biofeedback in the prevention and treatment of illness and the enhancement and maintenance of health.
Pre-requisite: CCP 706 Minimum Grade of B.

**CCP 752 Clinical Neuropsychology 3 cr**
This course will offer an in-depth understanding of the different theories of brain function in humans. Assessment methods for detecting abnormal functioning and the localization of functioning by behavioral methods will also be examined. The possible etiologies of abnormal functioning as well as their treatment will be reviewed.
Pre-requisite: CCP 706 Minimum Grade of B and CCP 742 Minimum Grade of B.

**CCP 756 Practicum Therapy 1 TO 3 cr**
Supervised experience with child and/or adult populations; includes case conference and seminars. This course may include supervised placement in an applied setting.
Pre-requisite: CCP 706 Minimum Grade of B or PSY 506 Minimum Grade of B. CCP 706 and PSY 506 can be taken concurrently with this course.

**CCP 758 Psychology Resilience & Trauma 3 cr**
This course will offer an in-depth understanding of resilience, as it manifests across the lifespan in response to various types of traumas (natural vs. manmade; community-wide versus family- or individually-specific). Prevention and reduction of psychological impact related to trauma and the development, enhancement, and maintenance of resilience in the face of adversity will be emphasized.
Pre-requisite: CCP 706 Minimum Grade of B. CCP 706 can be taken concurrently with this course.

**CCP 759 Group and Systems Theory 3 cr**
This course will survey group and systems theories and the interventions that have been derived from this perspective. The dynamics of group processes will be delineated.
Pre-requisite: CCP 706 Minimum Grade of B.

**CCP 763 Prevention Treat Public Health 3 cr**
This course will survey the basic theory and techniques underlying the study of public health problems. Research related to the prevention and treatment of several specific public health problems (e.g. suicide, HIV/AIDS, youth violence) will be covered in depth.

**CCP 764 Consult Psych Program Develop 3 cr**
This course provides an overview of approaches to psychological consulting and program development in individual, small group and large organization contexts. Specific aspects of psychological consulting in mental health, business, and educational settings will be reviewed.

**CCP 766 Clinical Supervision 3 cr**
This course provides an overview of the various theoretical approaches to supervision of professional psychological services, particularly psychotherapy services. In addition, relevant research findings in the area of supervision are reviewed. Students also have the opportunity to receive feedback on audio/video tapes of their supervision sessions with a junior graduate student clinician.
Pre-requisite: CCP 706 Minimum Grade of B and CCP 756 Minimum Grade of S.

**CCP 772 Child Family Psychopath Interv 3 cr**
This course provides an overview of current theory and research findings relevant to psychological disorders typically occurring in childhood and adolescence. In addition, evidence-based interventions for various childhood disorders are reviewed. A focus will be upon an ecological and developmental view of childhood psychopathology that integrates family, community, and societal forces in a comprehensive view of such disorders.
Pre-requisite: CCP 706 Minimum Grade of B.

**CCP 780 Applied Health Psychology 3 cr**
This course will survey theory, research, and applications of health psychology in the prevention and treatment of illness and the enhancement and maintenance of health.
Pre-requisite: CCP 706 Minimum Grade of B. CCP 706 can be taken concurrently with this course.
CCP 782  Advanced Practicum  1 TO 3 cr
Supervised experience with child and/or adult populations in a variety of settings; includes case conferences and advanced psychological assessment and interventions and supervision of lower level graduate students.
Pre-requisite: CCP 756 Minimum Grade of B.

CCP 790  Special Topics-  0 TO 3 cr
Selected topics in psychology and may be repeated or credit when course varies.

CCP 795  MCPP  3 cr
CCP 795 Multicultural Counseling in Professional Psychology. Provides a foundation in multicultural awareness, knowledge, and skills from a clinical and counseling psychology perspective.

CCP 796  Directed Studies  1 TO 3 cr
Directed study and research.

CCP 797  Psychology Internship  1 TO 3 cr
The predoctoral internship is a supervised learning experience in a work setting similar to that in which students will eventually be employed. The internship provides students with an opportunity to apply the theories and concepts learned during their graduate program. Not more than 18 hours may be taken.

CCP 799  Dissertation Research  1 TO 6 cr
Completion and oral defense of a dissertation based upon original research. May be repeated for up to 12 hours credit. A minimum of nine hours is required to meet degree requirements.

Co-op (COE)

COE 100  COOP Alternating I  0 cr
Work assignment as per program.

COE 101  COOP Alternating II  0 cr
Work assignment as per program.
Pre-requisite: COE 100 Minimum Grade of S.

COE 110  COOP Parallel I  0 cr
Work assignment as per program.

COE 111  COOP Parallel II  0 cr
Work assignment as per program.
Pre-requisite: COE 110 Minimum Grade of S.

COE 120  Internship I  0 cr
Work assignment as per program.

COE 121  Internship II  0 cr
Work assignment as per program.
Pre-requisite: COE 120 Minimum Grade of S.

COE 200  COOP Alternating III  0 cr
Work assignment as per program
Pre-requisite: COE 101 Minimum Grade of S.

COE 201  COOP Alternating IV  0 cr
Work assignment as per program.
Pre-requisite: COE 200 Minimum Grade of S.

COE 210  COOP Parallel III  0 cr
Work assignment as per program.
Pre-requisite: COE 111 Minimum Grade of S.

COE 211  COOP Parallel IV  0 cr
Work assignment as per program.
Pre-requisite: COE 210 Minimum Grade of S.

COE 220  Internship III  0 cr
Work assignment as per program.
Pre-requisite: COE 121 Minimum Grade of S.

COE 221  Internship IV  0 cr
Work assignment as per program.
Pre-requisite: COE 220 Minimum Grade of S.

COE 300  COOP Alternating V  0 cr
Work assignment as per program.
Pre-requisite: COE 201 Minimum Grade of S.

COE 301  COOP Alternating VI  0 cr
Work assignment as per program.
Pre-requisite: COE 300 Minimum Grade of S.

COE 310  COOP Parallel V  0 cr
Work assignment as per program.
Pre-requisite: COE 211 Minimum Grade of S.

COE 311  COOP Parallel VI  0 cr
Work assignment as per program.
Pre-requisite: COE 310 Minimum Grade of S.

COE 400  COOP Alternating VII  0 cr
Work assignment as per program.
Pre-requisite: COE 301 Minimum Grade of S.

COE 401  COOP Alternating VIII  0 cr
Work assignment as per program.
Pre-requisite: COE 400 Minimum Grade of S.

COE 410  COOP Parallel VII  0 cr
Work assignment as per program.
Pre-requisite: COE 311 Minimum Grade of S.

COE 411  COOP Parallel VIII  0 cr
Work assignment as per program.
Pre-requisite: COE 410 Minimum Grade of S.

COE 500  COOP Alternating I  0 cr
Work assignment as per program

COE 501  COOP Alternating II  0 cr
Work assignment as per program
Pre-requisite: COE 500 Minimum Grade of S.

COE 510  COOP Parallel I  0 cr
Work assignment as per program
COE 511  COOP Parallel II  0 cr
Work assignment as per program
Pre-requisite: COE 510 Minimum Grade of S.

COE 600  COOP Alternating III  0 cr
Work assignment as per program.
Pre-requisite: COE 501 Minimum Grade of S.

COE 601  COOP Alternating IV  0 cr
Work assignment as per program.
Pre-requisite: COE 600 Minimum Grade of S.

COE 610  COOP Parallel III  0 cr
Work assignment as per program.
Pre-requisite: COE 511 Minimum Grade of S.

COE 611  COOP Parallel IV  0 cr
Work assignment as per program.
Pre-requisite: COE 610 Minimum Grade of S.

CMN 351  Psy-Mental Health Nsg Clin  2 cr
The purpose of this course is to provide students the opportunity to analyze theories, concepts, research, and issues and trends in psychiatric-mental health nursing.
The focus of the course is on internal and external factors affecting the mental health of children, adolescents, adults, elderly, and families. The emphasis is on the role of the professional nurse in health promotion and maintenance, illness care, and rehabilitation of children, adolescents, adults, elderly, and families experiencing psychiatric-mental health concerns.
Co-requisite: CMN 350

CMN 411  Nursing in Community Systems  4 cr
The purpose of this course is to provide students an in-depth exploration of community health nursing concepts and principles from a population health care perspective. The course focuses on the prevention of disease and promotion of health. Resources which support disease prevention and health promotion are investigated and evaluated. The changing needs of an increasingly culturally diverse population within the social context of community systems are examined along with the environmental, economical, political, and legal constraints to the health of community systems. Course content includes concepts from nursing and the public health sciences. The course will emphasize the use of nursing process and public health concepts to assess the complex factors in the community that affect the health of populations.

CMN 420  Community Health Nursing  3 cr
The purpose of this course is to provide students an opportunity to explore community health nursing concepts and principles from a population health care perspective. The changing needs of an increasingly culturally diverse population within the social context of the community systems are examined along with the environmental, economical, political, and legal constraints to the health of systems.
Co-requisite: CMN 421
Pre-requisite: (AHN 330 Minimum Grade of C or AHN 447 Minimum Grade of C) and (AHN 331 Minimum Grade of C or AHN 448 Minimum Grade of C) and CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C and MCN 347 Minimum Grade of C and MCN 348 Minimum Grade of C. AHN 330 and AHN 447 and AHN 331 and AHN 448 can be taken concurrently with this course.
CMN 421 Community Health Nurs Clinical 1 cr
The purpose of this course is to provide students the opportunity to complete a clinical project integrating community health nursing concepts and principles from an aggregate health care perspective. The changing needs of an increasingly culturally diverse population within the social context of the community are examined. Course content includes environmental, economical, political, and legal constraints to the health of aggregates.
Co-requisite: CMN 420
Pre-requisite: (AHN 330 Minimum Grade of C or AHN 447 Minimum Grade of C) and (AHN 331 Minimum Grade of C or AHN 448 Minimum Grade of C) and CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C and MCN 347 Minimum Grade of C and MCN 348 Minimum Grade of C. AHN 330 and AHN 447 and AHN 331 and AHN 448 can be taken concurrently with this course.

CMN 547 Psych Family Nsg Intensive 1 cr
This is a clinical practice course in psychiatric-mental health nursing. The focus is on the application of theories, concepts, research, and issues and trends in psychiatric-mental health nursing and on the use of the nursing process with children, adolescents, adults and families experiencing psychiatric-mental health concerns.

CMN 548 Intro to Family Psych NP 3 cr
The purpose of this first didactic course is to prepare the Advanced Family Psychiatric/Mental Health Nurse Practitioner students to assess, diagnose, and manage selected health care needs of adults and children. Emphasis is placed on synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management.
Co-requisite: CMN 551
Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.

CMN 550 Psych Family NP Cl Progression 1 TO 4 cr
The purpose of this progression course is to provide opportunities for Psychiatric/Mental Health Nurse Practitioner students to apply concepts from Advanced Psychiatric/Mental Health Nursing I in primary and acute care mental health settings with adults and families experiencing psychiatric/mental health concerns. The emphasis is on mental health nursing across the lifespan.

CMN 551 HPDP & Issues for Fam Psych NP 2 cr
This didactic course prepares the Family Psychiatric/Mental Health Nurse Practitioner student to identify and implement appropriate and culturally sensitive health promotion and disease prevention strategies across the lifespan of individuals and families in primary care settings. Emphasis is placed on health promotion/disease prevention with strategic planning at the primary, secondary, and tertiary levels.
Co-requisite: CMN 548

CMN 552 Family Psych NP I 3 cr
This didactic course prepares the Advanced Family Psychiatric-Mental Health Nurse Practitioner student to assess, diagnose, and manage selected health care needs of culturally diverse populations across the life span. The focus is on advanced practice nursing with individuals and families in a variety of health care settings. Emphasis is placed on wellness and the pathophysiology and epidemiology underlying acute and chronic psychiatric/mental health problems.
Co-requisite: CMN 553
Pre-requisite: CMN 548 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.

CMN 553 Family Psych NP Practicum I 3 cr
The purpose of this practicum course is to provide opportunities for Advanced Family Psychiatric-Mental Health Nurse Practitioner students to apply concepts in primary and acute care settings with adults and families experiencing psychiatric/mental health concerns. The emphasis is on mental health nursing across the lifespan.
Co-requisite: CMN 552
Pre-requisite: CMN 552 Minimum Grade of C.

CMN 554 Family Psych NP II 3 cr
The purpose of this course is to provide the Advanced Family Psychiatric-Mental Health Nurse Practitioner student an in-depth study of psychiatric/mental health care management of adults and their families within the framework of advanced nursing. The focus is on selected acute and chronic complex psychiatric/mental health care problems. Emphasis is on the interaction among health care providers in a culturally diverse environment.
Co-requisite: CMN 555
Pre-requisite: CMN 552 Minimum Grade of C.

CMN 555 Family Psych NP Practicum II 3 cr
The purpose of this course is to provide opportunity for the Advanced Family Psychiatric-Mental Health Nurse Practitioner student to practice within advanced nursing framework. The focus is on the role of the advanced practice nurse in the health care management of adults with psychiatric/mental health concerns. Emphasis is on collaboration with other health care providers in a culturally diverse environment.
Co-requisite: CMN 554

CMN 556 Family Psych NP Practicum III 4 cr
The purpose of this culminating course is to provide a preceptor and faculty facilitated experience in the Advanced Family Psychiatric-Mental Health Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses.
Co-requisite: CMN 557
Pre-requisite: CMN 554 Minimum Grade of C and NU 610 Minimum Grade of C or NU 607 Minimum Grade of C or NU 608 Minimum Grade of C or NU 613 Minimum Grade of C. NU 610 and NU 607 and NU 608 and NU 613 can be taken concurrently with this course.
CMN 557  Family Psych NP III  3 cr
The purpose of this course is to provide a forum for the evaluation of issues and trends encountered in Advanced Family Psychiatric-Mental Health Nurse Practitioner health care. Emphasis is on critical analysis and management of issues by the Psychiatric-Mental Health Nurse Practitioner in an interdisciplinary health care delivery system.
Co-requisite: CMN 556
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

CMN 556  Family NP Clin Progression  1 TO 9 cr
The purpose of this practicum course is to provide opportunities for the Family Nurse Practitioner to apply concepts from previous courses and CMN 572, 574, or 577 in select clinical settings. Focus is on individuals and families in primary care settings. The emphasis is on diagnostic reasoning and decision-making/critical-thinking.

CMN 568  Intro to Family NP  3 cr
The purpose of this first didactic course is to prepare Advanced Family Nurse Practitioner students to assess, diagnose, and manage selected health care needs of adults and children. Emphasis is placed on synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management.
Co-requisite: CMN 571
Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.

CMN 571  HPDP in Family NP  2 cr
The purpose of this didactic course is to prepare the Advanced Family Nurse Practitioner student to identify and implement appropriate and culturally competent health promotion and disease prevention strategies across the lifespan. The focus is on the advanced practice nursing of individuals and families in primary care settings. Emphasis is placed on health promotion/disease prevention with strategic planning at the primary, secondary, and tertiary levels of prevention. Prevention, early diagnosis, prompt treatment, and in-depth patient education with dysmetabolic syndrome and diabetes will be emphasized. Effective strategies for life-style behavior change will also be evaluated.
Co-requisite: CMN 568

CMN 572  Family NP I  3 cr
This didactic course prepares the Advanced Family Nurse Practitioner student to assess, diagnose, and manage selected health care needs of culturally diverse populations across the lifespan. The focus in on the advanced practice nursing of individuals and families in primary care settings. Emphasis is placed on wellness and the pathophysiology and epidemiology underlying acute and chronic health problems.
Co-requisite: CMN 573
Pre-requisite: CMN 568 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.

CMN 573  Family NP Pract I  3 cr
This practicum course provides opportunities for the Advanced Family Nurse Practitioner to apply concepts in select clinical settings. Focus is on individuals and families in primary care settings. The emphasis is on culturally competent delivery of health care, diagnostic reasoning and decision making/critical thinking.
Co-requisite: CMN 572

CMN 574  Family NP II  3 cr
This course provides an in-depth study of the health care management of children, adults, and families within the framework of advanced nursing. Emphasis is on the interaction among health care providers in a culturally diverse environment. The focus is on selected acute and chronic complex health problems of children, adults, and families in primary health care settings.
Co-requisite: CMN 575
Pre-requisite: CMN 572 Minimum Grade of C.

CMN 575  Family NP Pract II  3 cr
This practicum course provides an opportunity for the Advanced Family Nurse Practitioner student to practice within an advanced nursing framework. The focus is on the role of the advanced practice nurse in the health care management of children, adults, and families. Emphasis is on collaboration with other health care providers in a culturally diverse environment.
Co-requisite: CMN 574

CMN 576  Family NP Pract III  4 cr
The purpose of this practicum course is to provide opportunities for the Family Nurse Practitioner student to apply concepts from CMN 577 and previously required courses in select clinical settings. Focus is on individuals and families in primary care settings. The emphasis is on diagnostic reasoning and decision making/critical thinking.
Co-requisite: CMN 577
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C. NU 607 and NU 608 can be taken concurrently with this course.
CMN 577  Family NP III  3 cr
The purpose of this course is to provide a forum for the evaluation of issues and trends encountered in health care. Emphasis is on critical analysis and management of these issues by the Advanced Family Nurse Practitioner student in an interdisciplinary health care system.
Co-requisite: CMN 576
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

CMN 604 Psychiatric Family NP PP&D  3 cr
This course assists the Family Psych Mental Health Nurse Practitioner student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the Family Psych Mental Health Nurse Practitioner student's selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

CMN 617 Family Psych NP Residency I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The Family Psych Nurse Practitioner student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the Nurse Practitioner DNP student will work with the primary faculty advisor to complete projects and advance their selected practice area. The Nurse Practitioner student will have access to and authority for expanded scope of practice to master the DNP competences. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, students must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required.
Pre-requisite: CMN 604 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

CMN 618 Family Psych NP Residency II  3 cr
Provides students the opportunity to fully express all DNP competencies. The student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: CMN 617 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

CMN 619 Family Psych NP Residency III  3 cr
Final course in residency series as student continues to implement and evaluate project plan. Provides student the opportunity to fully express all DNP competencies. The student, guided by the core faculty and advisor, completes quality improvement evidence-based system's change project.
Pre-requisite: CMN 618 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

CMN 643 Public Health Admin PP&D  3 cr
This course assists the public health nursing administration DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the public health students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

CMN 644 Public Health Residency I  3 TO 6 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The public health nursing administration student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the public health nursing administration DNP student will work with the primary faculty advisor to complete projects and advance their selected practice area. The public health nursing administration student will have access to and authority for expanded scope of practice to master the DNP competences. Residency sites will depend upon the public health nursing administration student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required.
Pre-requisite: CMN 643 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

CMN 645 Public Health Residency II  3 TO 6 cr
Provides public health nursing administration students the opportunity to fully express all DNP competencies. The public health nursing administration student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: CMN 644 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.
CMN 646  Public Health Residency III  3 TO 6 cr
Final course in residency series, the public health nursing administration student continues to implement and evaluate project plan. Provides public health nursing administration student the opportunity to fully express all DNP competencies. The public health nursing administration student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: CMN 645 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

CMN 680  Family NP PP&D  3 cr
This course assists the family nurse practitioner student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the family nurse practitioner students’ selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

CMN 681  Family NP Residency I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The family nurse practitioner student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the family nurse practitioner student will work with the primary faculty advisor to complete projects and advance their selected practice area. The student will have access to and authority for expanded scope of practice to master the DNP competencies. Residency sites will depend upon the family nurse practitioner student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. A total of 180 clinical hours of direct practice/management is required.
Pre-requisite: CMN 680 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

CMN 682  Family NP Residency II  3 cr
Provides family nurse practitioner students the opportunity to fully express all DNP competencies. The family nurse practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: CMN 681 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

CMN 683  Family NP Residency III  3 cr
Final course in residency series, the family nurse practitioner student continues to implement and evaluate project plan. This course provides the family nurse practitioner student the opportunity to fully express all DNP competencies. The family nurse practitioner student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: CMN 682 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

CMN 692  CMN DNP Project Progression  3 cr
Students will register for this course to complete residency course work under supervision of faculty. Students must remain continuously enrolled until all residency requirements are completed.
Co-requisite: CMN 619
Pre-requisite: CMN 618 Minimum Grade of C or CMN 645 Minimum Grade of C or CMN 682 Minimum Grade of C.

Communication (CA)

CA 110L  Public Speaking Lab  0 cr
Public speaking labs associated with blended public speaking sections. CA 110 and CA 110L must be taken concurrently. Likewise, if a student drops CA 110, he/she must drop CA 110L at the same time. Together, CA 110 and CA 110L satisfy the general education public speaking requirement.
Co-requisite: CA 110

CA 100  Intro to Communication Media  3 cr
Course examines various approaches people take to communicating. Focuses on developing an awareness of how and why we communicate and why we do not always communicate effectively. Includes consideration of variables related to interpersonal, group, public, and mass-communication contexts. Fee.

CA 101  Introduction to Media  3 cr
Course examines the functioning of communication media in contemporary society including the political, economic and social environment. The structure and functions of newspapers, magazines, film, recording, radio, television, advertising and public relations industries are examined. The impact of the media on individuals and institutions is explored. Fee.

CA 110  Public Speaking  3 cr
A beginning study of the principles of speech communication as they relate to speaker-audience communication. The student is provided an opportunity to develop the art of audience and subject analysis, research, critical thinking, organization, language, and delivery of speeches. This course includes a video component. Fee.
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CA 200</td>
<td>Survey of Comm Theory</td>
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<td></td>
<td>Introductory survey of theoretical orientations</td>
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<td>in the field of human communication. Focuses on alternative</td>
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<td>explanations regarding elements of the communica</td>
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<td>tion process, models of communication, the communica</td>
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<td>tion act, and the communication relationship. Fee.</td>
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<td>Pre-requisite:</td>
<td>(ACT English 27 or SAT Critical Reading 610</td>
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<td>CA 210</td>
<td>Argumentation</td>
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<td>Examines the role of argumentation in a democra</td>
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<td>tic society and aims to develop critical thinking</td>
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<td>and reasoned advocacy. Course makes functional a</td>
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<td>knowledge of tests of evidence and the modes of</td>
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<td>logical reasoning. Students participate in variou</td>
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<td>s forms of argumentation and debating. Fee.</td>
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<td>Pre-requisite:</td>
<td>EH 101 Minimum Grade of C and EH 102 Minimum</td>
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<td>CA 211</td>
<td>Interpersonal Comm</td>
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<td>A study of communication behavior in the interpere</td>
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<td>ncial setting. Focuses on development of knowledge,</td>
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<td>trust, understanding, supportiveness, etc., in a</td>
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<td>relationship, and their collective impact on the</td>
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<td>communication exchange. Fee.</td>
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<td>CA 220</td>
<td>Writing Comm Media - W</td>
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<td></td>
<td>Intensive study of writing for various media and</td>
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<td>audiences. Specific attention is given to improv</td>
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<td>tuation, spelling, word use, sentence composition,</td>
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<td>Associated Press style, and organization of ma</td>
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<td>terial, as well as the different formats for the</td>
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<td>different media. Media styles studied include pri</td>
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<td>nt, broadcast, on-line journalism, and public re</td>
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<td>lations, which also includes a study of evaluating,</td>
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<td>documenting, and prioritizing facts in the writi</td>
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<td>ng of news stories and media releases for public</td>
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<td>relations. Computer fee.</td>
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<td>Pre-requisite:</td>
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<td>CA 222</td>
<td>Rhetoric, Culture, and Society</td>
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<td></td>
<td>Course examines rhetoric or the art of persua</td>
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<td>sion, as it relates to popular culture. Students</td>
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<td>will apply rhetorical theory to such topics as</td>
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<td>music, film, and advertising.</td>
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<td>CA 224</td>
<td>Intro to Strategic Comm</td>
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<td>Introduction to Strategic Communication focuses</td>
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<td>on theories, concepts and applications of the ad</td>
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<td>vertising and public relations fields. It provi</td>
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<td>des an overview of theories, practices, ethics,</td>
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<td>campaigns, and the role of strategic communica</td>
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<td>tion in the process of marketing products, ideas,</td>
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<td>and people. The course involves the evaluation</td>
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<td>of communication ideas used to build brands, cre</td>
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<td>ate and sustain positive relationships, and solve</td>
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<td>problems to advance the interests of brands and</td>
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<td>organizations. Pre-requisite: CA 101 Minimum Gra</td>
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<td>CA 230</td>
<td>Comm in Organization</td>
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<td>Application of communication principles and tech</td>
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<td>niques to those aspects of one's life in an orga</td>
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<td>nization that have been shown to be the most dif</td>
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<td>ficult and troublesome parts of the communication</td>
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<td>milieu in the world of work. Includes interviewi</td>
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<td>ng, conference participation, leadership decisi</td>
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<td>ons, conflict management, and organizational cha</td>
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<td>nge as communication phenomena. Fee.</td>
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<td>CA 240</td>
<td>Digital Cinema Prod Basics</td>
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<td>This course will teach the basics of directing,</td>
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<td>composition, lighting, audio and editing in the</td>
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<td>digital realm. Techniques of working with actors</td>
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<td>and the technical and aesthetic considerati</td>
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<td>ons of moving-picture photography, audio design</td>
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<td>and storytelling through editing will be covered</td>
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<td>by lecture, example, and practical exercise. Tec</td>
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<td>CA 241</td>
<td>Intro TV Studio Production</td>
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<tr>
<td></td>
<td>Theory and practice of television production. C</td>
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<td>oncentrates on exploring the uses of television</td>
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<td>in varied contexts, including corporate, communi</td>
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<td>ty, and broadcasting applications. Fee.</td>
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<td>CA 244</td>
<td>Radio Broadcasting</td>
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<td></td>
<td>A survey of radio broadcast operations. Examines</td>
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<td>terrestrial, Internet, and satellite radio. Em</td>
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<td>phasis on audience analysis, programming, pro</td>
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<td>motions, production, performance, and regulatory</td>
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<td>standards. Fee.</td>
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<td>CA 250</td>
<td>Radio and TV Performance</td>
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<td>Course focuses on the unique aspects of radio a</td>
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<td>nd television as communication media. Different</td>
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<td>styles of delivery for various media projects w</td>
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<td>ill be studied - broadcast news, advertising, a</td>
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<td>nd entertainment. Course also focuses on restrai</td>
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<td>nts and requirements of the individual medium o</td>
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<td>n the practice of broadcast delivery. Fee.</td>
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<td>Pre-requisite:</td>
<td>CA 110 Minimum Grade of D.</td>
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<td>CA 260</td>
<td>Digital Writing and Production</td>
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<td>This course considers the nature of the digital</td>
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<td>environment as it relates to communication. Topi</td>
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<td>c include writing in the online environment, eff</td>
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<td>ective use of images and multimedia, and basic w</td>
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<td>eb design. Computer fee.</td>
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CA 270  Sports Journalism  3 cr
This is a traditional lecture and writing course that will provide students with an overview of sports journalism and hone writing, reporting and editing skills. Students will learn how to write a game story, advance/follow-up story, sports column and feature story during the semester. As in the journalism industry, students will adhere to strict deadlines. Computer Fee.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CA 271  Strategic Publication Design  3 cr
Course focuses on the approaches of visual communication to strategically reach target audiences and meet an organization's mission brand and communication specific goals. This involves the use of modern industry software tools to apply the concepts and techniques of basic design principles, color, typography, layout and graphics in the planning and development of publications and design pieces. Computer Fee.
Pre-requisite: CA 101 Minimum Grade of D and (EH 101 Minimum Grade of D or EH 110 Minimum Grade of D or EH 190 Minimum Grade of D or USA 010 Minimum Grade of D) and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D).

CA 275  Decision Making - Small Groups  3 cr
Theory and practice in leading and participating in small group decision making. Special focus on group problem solving and the management of conflict in small group decision-making meetings. Fee.

CA 281  Editing and Layout  3 cr
Principles and practices of selection and preparation of written and pictorial materials for newspapers, magazines, and related media. Layout and design, production planning, and related topics. Computer Fee.
Pre-requisite: CA 220 Minimum Grade of C.

CA 283  Chinese Film  3 cr
This course will introduce students to major topics in Chinese history, covering both ancient periods, such as the Three Kingdoms period, and twentieth-century events such as the war with Japan and the Cultural Revolution. Post-Tiananmen Chinese society will also be stressed. Students will explore these themes through Chinese film and literature, and will thus become familiar with major directors, including Zhang Yimou and Jia Zhangke and writers such as Yu Hua.

CA 288  History of the Mass Media  3 cr
The role of journalism in American society from the Revolution to the present. This course is equivalent on HY 288. Fee.

CA 290  Special Topics -  1 TO 3 cr
A variable-topics course treating communication concepts and topics relevant to the disciplines. May be repeated once when course content changes for a total of six credit hours. Fee.

CA 300  Fnds of Comm Research  3 cr
Introduction to research foundations in the field of communication. Includes historical, critical, descriptive, and experimental methods. Computer fee.

CA 301  Skepticism in Media-Philosophy  3 cr
This course examines some of the most fundamental questions about human knowledge, belief and rationality and compares the treatment of such issues in philosophical discussions and contemporary media, especially film. Identical with PHL 301. Credit cannot be received for both CA 301 and PHL 301.
Pre-requisite: EH 102 Minimum Grade of D or EH 103 Minimum Grade of D.

CA 310  Persuasion  3 cr
Basic theories and techniques of persuasion and their application to typical communication situations and problems in today's society. Fee.

CA 315  Gender and Communication  3 cr
Survey of research and theory concerning the differences in communication between men and women and the effects and functions of communication between men and women. Fee.

CA 320  Broadcast Scriptwriting - W  3 cr
Study and practice in the techniques of writing scripts for radio and television. Special scripting projects. Fee.
Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.

CA 321  Media Planning  3 cr
Students develop an understanding of planning traditional and digital media as a part of an integrated brand communication strategy. The course concentrates specifically on how media work together strategically to shape consumers' brand experiences across media platforms. Fee.
Pre-requisite: CA 220 Minimum Grade of C and CA 224 Minimum Grade of C.

CA 322  Creative Strategy - W  3 cr
Creative Strategy focuses on the theoretical foundations of creative strategic thinking in advertising and visual communication. The course concentrates on writing effective copy for traditional and digital media as part of a strategic brand communication campaign. Computer Fee.
Pre-requisite: CA 224 Minimum Grade of D.

CA 323  Sports PR  3 cr
Study of the role of public relations in sports, particularly as it relates to strategic communication. Discussion topics include the sports organization - media relationship, organizational media (traditional and digital), the legal and ethical dimensions of sport, and crisis communication. Fee.
Pre-requisite: CA 224 Minimum Grade of D.
CA 324  Strategic Writing - W  3 cr
Strategic Writing focuses on understanding writing styles and formats of different communication media for maximum message impact. This involves crafting written messages for specific target audiences, selecting appropriate media and the adaptation of writing style and tone. Emphasis is placed on strategic, concise and effective writing. Computer Fee. Pre-requisite: CA 220 Minimum Grade of C and CA 224 Minimum Grade of D.

CA 325  Applied Comm Workshop  3 cr
A workshop stressing practical applications of the principles and theories of communication disciplines to those settings and problems in the world of work that are of special interest to the students enrolled. Fee.

CA 326  P.R. & Non-Profit Fundraising  3 cr
Public Relations and Non-Profit Fundraising provides an understanding of how organizations use public relations to build mutually beneficial relationships between organizations and their public to achieve their philanthropy goals through effective fundraising. Pre-requisite: CA 224 Minimum Grade of D.

CA 330  Intercultural Communication-W  3 cr
CA 330 is the study of the theory and practice of intercultural communication. The course's goal is to focus on global dialogues within critical organizational incidents. This course has three objectives: to explain the culture-based situational conflict model; to integrate theory and practice in the discussion of organizational conflict; and to provide an excellent opportunity for writing within the organizational communication content areas.

CA 340  Video Field Production  3 cr
The focus of this course is on production techniques, processes and skills. Analysis of television production as a communication process, program formats, production equipment and facilities, production and unit management and the role of the director. Fee. Pre-requisite: CA 101 Minimum Grade of D.

CA 341  Intermediate TV Studio Prod  3 cr
This course will give students practical grounding in the concepts and technology associated with the production of studio-based news and information programs. Technology Fee. Pre-requisite: CA 241 Minimum Grade of D.

CA 343  Film History  3 cr
An examination of the development of motion pictures from 1893 to the present. Films representing major periods, movements, and styles will be examined. Fee.

CA 344  Film and TV Genres  3 cr
A study of the formation and evolution of film and television genres. Selected genres will be studied in terms of their structure and cultural history. Fee.

CA 350  Broadcast News  3 cr
Course includes both writing in the broadcast media and exploring broadcast news operations. Assignments include writing broadcast news stories and evaluating broadcast news operations. Lectures cover the characteristics of broadcast news, news styles, news policy, and ethics and responsibility in broadcast news. Fee Pre-requisite: CA 220 Minimum Grade of C.

CA 352  Media Literacy Information Age  3 cr
Study of how to be a good consumer of mass media messages. Topics include how media messages are affected by media production techniques, media technology, professional values and the media's political-economic structure. Fee. Pre-requisite: CA 100 Minimum Grade of D or CA 101 Minimum Grade of D.

CA 353  Broadcast News Editing  3 cr
This course focuses on the post-education for television news. Students will edit footage they shot for CA 350, learning to weave together b-roll, interview, natural sound, and voice-over to create a compelling narrative. Co-requisite: CA 350 Pre-requisite: CA 220 Minimum Grade of C. CA 220 can be taken concurrently with this course.

CA 354  Media and Politics  3 cr
Examining the role and influence of mass media in politics, exploring how and why the media contribute to and shape democracy. Pre-requisite: (PSC 130 Minimum Grade of C or CA 100 Minimum Grade of C or CA 101 Minimum Grade of C).

CA 356  Digital Cinema Management  3 cr
A survey of the legal, budgeting, revenue stream and distribution issues associated with film and television production. Topics include preproduction and production management, script breakdown, scheduling, and above and below the line talent. Computer Fee.

CA 357  Basic Film Production  3 cr
This course will teach the basics of planning, scripting, shooting and editing short films in the 16mm format. Technology Fee. Pre-requisite: CA 240 Minimum Grade of D and CA 340 Minimum Grade of D.

CA 358  Digit Comp, Animation & Graph  3 cr
This course will introduce the basics of digital special-effects, two-dimensional computer animation and two- and three-dimensional video graphics. Technology Fee. Pre-requisite: CA 240 Minimum Grade of D and CA 340 Minimum Grade of D.
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CA 360</td>
<td>Comm and the Internet</td>
<td>3 cr</td>
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<td></td>
<td>Intensive study and application of rhetorical and communication theories to understanding problems that arise as the Internet and the World Wide Web begin to render fixed media-based communication obsolete. Implications for advertising, journalism, organizational record keeping and management, interpersonal communication, training, entertainment, etc. Computer fee.</td>
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<tr>
<td>CA 366</td>
<td>Visual Info Electron Com Media</td>
<td>3 cr</td>
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<td>Rhetorical issues in the design of Internet and World Wide Web materials. Focus on how motion, color, and other visual elements compete for audience attention; how rhetorical theory, learning theory, and communication theory inform the myriad decisions involved in visual presentation. This course will address these rhetorical issues from the creator's and user's view point. Computer fee.</td>
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<tr>
<td>CA 370</td>
<td>Interm Reporting-Writing-W</td>
<td>3 cr</td>
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<td>Study of intermediate skills needed for reporting, evaluating, and writing news stories, with particular attention given to the reporting of public affairs issues. Vanguard practicum. Fee. Pre-requisite: (CA 220 Minimum Grade of C and EH 102 Minimum Grade of C).</td>
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<tr>
<td>CA 371</td>
<td>Branding &amp; Visual Messages</td>
<td>3 cr</td>
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<td>The focus of this course examines the understanding of how to build, measure and manage a brand from visual conception. Emphasis is on the visual aspects of brand management from the creative power of visual branding through research and visual strategy development and theories. Advanced areas of digital and/or print media are used in creative development and execution of persuasive and effective messages. Computer Fee. Pre-requisite: CA 271 Minimum Grade of D.</td>
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<tr>
<td>CA 381</td>
<td>Strategic Publication Design</td>
<td>3 cr</td>
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<td>Course focuses on the approaches of visual communication to strategically reach target audiences and meet an organization's mission, brand and communication specific goals. This involves the use of modern industry software tools to apply the concepts and techniques of basic design principles, color, typography, layout and graphics in the planning and development of publications and design pieces. Computer Fee. Pre-requisite: CA 224 Minimum Grade of C and CA 321 Minimum Grade of D and CA 324 Minimum Grade of D. CA 321 and CA 324 can be taken concurrently with this course.</td>
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<tr>
<td>CA 382</td>
<td>Photojournalism</td>
<td>3 cr</td>
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<td>The study of basic photography and the principles of still photography journalism, with particular emphasis on camera use, photo processing, visual aesthetics, and journalistic story-telling. Computer fee.</td>
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<tr>
<td>CA 383</td>
<td>Digital Photography</td>
<td>3 cr</td>
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<td>Through this course students will develop a general understanding of the ability of photographic images to communicate concepts, ideas and emotion through creative photography. It will be a hands-on course, in which students will use digital cameras to produce photographs that achieve the desired message. Computer Fee.</td>
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<tr>
<td>CA 384</td>
<td>Account Management</td>
<td>3 cr</td>
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<td>Students learn the account service function in an advertising agency. They develop an understanding of the account manager's role by focusing on the inter-relationships between the account manager, creative, media planners, and other agency specialists. Requires Junior or Senior standing. Computer fee. Pre-requisite: CA 224 Minimum Grade of D.</td>
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<tr>
<td>CA 387</td>
<td>Magazine &amp; Feature Writing-W</td>
<td>3 cr</td>
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<td>A writing and reporting course focusing on advanced skills, including alternative structures for news stories. Designed to give students a broad overview of the magazine industry and its current trends with emphasis on newspaper and magazine feature writing. Fee. Pre-requisite: (CA 220 Minimum Grade of C and EH 102 Minimum Grade of C).</td>
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<tr>
<td>CA 390</td>
<td>Special Topics -</td>
<td>1 TO 3 cr</td>
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<td></td>
<td>An advanced variable-topic course treating communication concepts and topics relevant to the discipline. May be repeated twice for up to six hours credit. Fee.</td>
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<td>CA 394</td>
<td>Dir St -</td>
<td>1 TO 3 cr</td>
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<td>Directed individual study of literature in an area of need and interest to the student. May be repeated for a maximum of six hours credit. Fee.</td>
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<tr>
<td>CA 410</td>
<td>Advanced Persuasion</td>
<td>3 cr</td>
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<td>An advanced examination of an application of persuasive techniques in communication situations and contexts (e.g. field, laboratory, interpersonal, small group, nonverbal, mass communication). Fee.</td>
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<tr>
<td>CA 411</td>
<td>Relational Communication</td>
<td>3 cr</td>
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<td>An examination of issues, theories, research and skills that apply to managing and nurturing close relationships. Emphasis is given to applying course concepts to promote relational growth and manage interpersonal conflict through interaction in relationships. Fee.</td>
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<tr>
<td>CA 422</td>
<td>Rhetorical Theory</td>
<td>3 cr</td>
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<td>A broad survey of the Western rhetorical tradition designed to give students a working knowledge of rhetoric and its historical and contemporary influence on communicative events and perspectives. Fee.</td>
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</tr>
</tbody>
</table>
CA 424  Rhetorical Criticism - W  3 cr
This course is designed to introduce students to the process of rhetorical analysis. Through criticism of communication artifacts, students learn to identify key elements of the rhetorical process and to develop critical thinking, writing, and viewing skills. The course prepares students to interpret, understand, analyze, and critique communication in diverse contexts including speeches, advertisements, interpersonal conversations, films, and works of art to name a few. Culminating experience for communication studies students. Fee.
Pre-requisite: (ACT English 27 or SAT Critical Reading 610 or University - EH101 Exempt P or (EH 101 Minimum Grade of C or EH 110 Minimum Grade of D or EH 190 Minimum Grade of D or USA 010 Minimum Grade of S) ) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CA 425  Issues in Rhetoric  3 cr
Close examination of a single contemporary rhetorical phenomenon. Topics will rotate based upon disciplinary relevance and student needs. May be repeated once for credit when content varies for a maximum of six credits.

CA 430  Adv Organizational Communicatn  3 cr
Study and application of organizational and communication theory of assessment of organizational and communication needs. Critical analysis of intervention programs and strategies. Fee.
Pre-requisite: CA 230 Minimum Grade of D.

CA 435  Comm Training-Dev Programs - W  3 cr
Review and analysis of communication training and development programs designed to solve communication problems in groups and organizations. Students will develop and present a training or development program. Computer fee

CA 440  Adv Video Field Production  3 cr
Theory and practice of television production. Concentrates on exploring and understanding the concepts and technology involved in advanced video production for a variety of applications including commercial, corporate, and community outlets. Culminating experience for digital cinema & television students. Fee.
Pre-requisite: CA 340 Minimum Grade of D.

CA 441  Adv TV Studio Production  3 cr
Advanced theory and practice of television production. Concentrates on exploring the advanced uses of television in varied contexts, including corporate, community, and broadcasting applications. Fee
Pre-requisite: CA 341 Minimum Grade of D.

CA 445  Ethics-Social Respons Comm  3 cr
Study of social responsibility and ethics in communication. Acquaints student with ethical standards and expectations society has for communicators. Capstone Course. Requires Junior or Senior standing. Fee.

CA 449  Mass Media Social Effects  3 cr
Examination of the interaction between mass communication and American society. Current research literature in the field will be analyzed and methods of improving the system will be discussed. Fee.
Pre-requisite: CA 101 Minimum Grade of D.

CA 450  Adv Broadcast News  3 cr
This is an advanced course in broadcast news reporting and production. Students will have hands-on practice in a newsroom situation. Fee.
Co-requisite: CA 451
Pre-requisite: CA 350 Minimum Grade of C.

CA 452  The News Documentary  3 cr
This course gives students experience in producing short documentaries for the media. Students will produce their own documentary with the intent of entering the finished product in student competitions. Culminating experience for broadcast journalism students. Fee.
Pre-requisite: CA 450 Minimum Grade of C.

CA 453  Campaign and Election Comm  3 cr
Provides students with a broad overview of political communication from both historical and contemporary perspectives so students may understand how the subject has evolved over time to become a unique field of theoretical and research interest. Special attention is paid to campaigns and elections, agenda-setting research, and media power. The major focus is on the United States. Fee.

CA 454  TV News Production  3 cr
This course is designed to give upper level Broadcast Journalism students hands-on experience creating a weekly television news program. Students will gain additional experience in news production and TV news programming. Students will report, produce and announce the news on the Jag-TV station.
Pre-requisite: CA 350 Minimum Grade of C and CA 450 Minimum Grade of C. CA 450 can be taken concurrently with this course.

CA 455  Law of Communication  3 cr
Study of the broad application of principles of law to American Communication, including study of free speech, freedom of information, mass media law and regulation including libel, copyright, and right of privacy. Fee.

CA 456  Social Media and Politics  3 cr
An examination of how and why digital information technologies are used by citizens, activists, journalists, and politicians to shape and influence individual's political participation and engagement and public policy and society. Pre-requisite: (PSC 130 or CA 100 or CA 101 ).
CA 460  Comm. Technology Systems  3 cr
An examination of the new communication technology systems with an emphasis on how they reconfigure patterns of communication organizations, production, storage, and dissemination. The role of communication technology systems today and tomorrow, and implications for organizational, local, national, and international contexts will be studied. Computer fee.

CA 470  Strategic Communication  3 cr
Digital media play a key role in campaigns and the daily work of marketing, advertising and public relations professionals. This course integrates the growing research in the area of digital media practices and focuses on engagement, listening and analytics. Fee.
Pre-requisite: CA 224 Minimum Grade of C and CA 300 Minimum Grade of C and CA 321 Minimum Grade of C.

CA 471  Prof & Creative Portfolio  3 cr
This course focuses on how to conceptualize and develop a professional and creative portfolio by creating a campaign spanning digital mass communication. Students examine the advertising creative industry from the perspectives of the media designer, freelancer, and entrepreneur while centering on the tools, techniques, principles, methods, strategies and practical skills needed to build an inspired portfolio. Computer Fee.
Pre-requisite: CA 371 Minimum Grade of D.

CA 472  Enterprise Reporting  3 cr
Advanced study of news reporting and presentation techniques including investigative reporting. Students concentrating in print will produce a professional-quality print project. Culminating experience for print journalism students who take this course. Computer fee.
Pre-requisite: CA 370 Minimum Grade of D. CA 370 can be taken concurrently with this course.

CA 474  Consumer Sales Promotion  3 cr
This course explores the role, function, planning and implementation of sales promotion in the brand communication process. Topics include contests, coupons, price discounts, sampling, and sweepstakes as well as the legal regulation of sales promotions. Computer Fee.
Pre-requisite: CA 224 Minimum Grade of D.

CA 475  Comm-Group Processes  3 cr
The nature of small group processes. Leadership, communication, and decision making in small groups. Fee.

CA 482  Multi-Media Story Telling  3 cr
This course will teach the basics of creating a professional-quality journalism story for the Web using multimedia techniques. We also explore how multimedia and interactivity are changing the communication experience for communication practitioners as well as for their audiences. Culminating experience for print journalism students who take this course. Technology Fee.
Pre-requisite: CA 260 Minimum Grade of D and CA 350 Minimum Grade of D and CA 382 Minimum Grade of D. CA 260 and CA 350 and CA 382 can be taken concurrently with this course.

CA 485  Cases in Strategic Comm  3 cr
Students study how strategic communication campaigns in the advertising and public relations fields have developed opportunities, strengthen relationships and solved problems through research, planning, communication, and evaluation. Using the case study approach, cases focus on strategic management, planning, decision-making and policy formation of the integration of strategies and tactics. Fee.
Pre-requisite: CA 300 Minimum Grade of D and CA 324 Minimum Grade of D. CA 300 and CA 324 can be taken concurrently with this course.

CA 486  Strategic Campaigns  3 cr
Students apply strategies and techniques in executing a professional strategic communication campaign for a corporate, nonprofit, association and/or government client. This involves research, audience analysis, objectives, tactics, planning, messaging, media strategies, communication, creative development, budgeting and evaluation. Fee.
Pre-requisite: CA 321 Minimum Grade of D and CA 271 Minimum Grade of D and CA 485 Minimum Grade of D.

CA 487  Tideline Agency  3 cr
This course allows students to execute strategic communication plans and creative materials for multimedia advertising and public relations campaigns for select clients in an agency setting. Students will learn and apply basic concepts involved in a working ad agency startup. Requires a minimum overall GPA of 3.0 and instructor permission. Technology fee.

CA 490  Special Topics  1 TO 3 cr
An advanced variable-topic course treating communication concepts and topics relevant to the discipline. May be repeated twice for up to six hours credit. Fee.

CA 492  Seminar -  1 TO 3 cr
An investigation of advanced topics and concepts of communication. Topics will rotate based upon disciplinary relevance and student need. May be repeated once for credit when content varies for a maximum of six credit hours. Fee.
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CA 494</td>
<td>Directed Studies</td>
<td>1 TO 3 cr</td>
<td>Investigation of questions of special interest in communication. May be repeated to a maximum of six semester hours, provided no repetition of subject matter occurs. Students are required to file a description of their goals and objectives for their study. This description is to be specific so that it can serve in place of a syllabus for this course. Fee.</td>
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<tr>
<td>CA 496</td>
<td>Prof Studies - Internship</td>
<td>1 TO 3 cr</td>
<td>On-the-job experience in a selected communication area related to potential career selection. Supervision by communication advisor and off-campus agency required. The Internship Program may be repeated for up to six credits. Requires prior approval of internship coordinator and student's advisor. Fee.</td>
</tr>
<tr>
<td>CA 499</td>
<td>Senior Honors Project - H</td>
<td>3 TO 6 cr</td>
<td>Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of Communication study, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to six credit hours. Fee.</td>
</tr>
<tr>
<td>CA 500</td>
<td>Found Graduate Study Comm</td>
<td>3 cr</td>
<td>This three-hour course provides an introduction to graduate study in the University of South Alabama Communication Department and an introduction to academic writing. This is a web-enhanced course. We will meet throughout the semester face-to-face in seminar format and in an informal “Meet and Greet” for graduate students and faculty.</td>
</tr>
<tr>
<td>CA 501</td>
<td>Qualitative Research Methods</td>
<td>3 cr</td>
<td>An in-depth study of a variety of qualitative research methodologies and their use in communication research, along with study of the use and practical applications of mixed-method and triangulation research methods. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 502</td>
<td>Communication Theory</td>
<td>3 cr</td>
<td>A survey of the theoretical perspectives that guide the study of communication. Competing and complementary epistemological frameworks will be compared. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 503</td>
<td>Quantitative Research Methods</td>
<td>3 cr</td>
<td>An investigation of research used in the study of communication; in-depth study of a variety of quantitative methodologies used in basic and applied communication research settings; study of statistical applications and practical interpretations. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 510</td>
<td>Persuasion in Professional Comm</td>
<td>3 cr</td>
<td>Advanced analysis and development of persuasive messages and argumentative strategies. Ethical responsibilities of the message sender will also be addressed. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 511</td>
<td>Theor Found in Interper Comm</td>
<td>3 cr</td>
<td>Review of the interpersonal communication research literature with respect to the process of mutual adaptation and negotiation. The social and psychological processes constraining and organizing interpersonal communication will be studied. Topics include verbal and nonverbal codes, message production and interpretation, conversation management, relationship definition, and interpersonal communication competence. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 522</td>
<td>Rhetorical Strategy Prof Comm</td>
<td>3 cr</td>
<td>A broad survey of the Western rhetorical tradition designed to give students a working knowledge of rhetoric and its historical and contemporary influence on communicative events and perspectives. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 524</td>
<td>Rhetorical Criticism</td>
<td>3 cr</td>
<td>This course is designed to introduce students to the process of rhetorical analysis. Through criticism of communication artifacts, students learn to identify key elements of the rhetorical process and to develop critical thinking, writing, and viewing skills. This course prepares students to interpret, understand, analyze, and critique communication in diverse contexts including speeches, advertisements, interpersonal conversations, films, and works of art to name a few. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 525</td>
<td>Issues in Rhetoric</td>
<td>3 cr</td>
<td>Close examination of a single contemporary rhetorical phenomenon. Topics will rotate based upon disciplinary relevance and student needs. May be repeated once for credit when content varies for a maximum of six credits. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 530</td>
<td>Analysis of Comm in Orgs.</td>
<td>3 cr</td>
<td>Analysis of interpersonal, dyadic, group, and organization-wide communication events that occur in organizational settings. Attention will be directed to the network of messages that occur in organizations and the organizational change that occurs when a message system is disrupted or changed. Organizational communication research methodologies will be introduced. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
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<td>Course Code</td>
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<tr>
<td>CA 535</td>
<td>Comm. Training &amp; Develop Prog.</td>
<td>3 cr</td>
<td>Review and analysis of communication training and development programs designed to solve communication problems in groups and organizations. Students will develop and present a training or development program. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 542</td>
<td>Moving Image Structure</td>
<td>3 cr</td>
<td>An analysis of moving-image form and process makers who supervise, produce, and/or evaluate electronic and/or film media for organizations. Theories of narrative and of moving-image syntax provide principles for structuring media content and managing the production process. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 545</td>
<td>Communication Ethics</td>
<td>3 cr</td>
<td>Advanced analysis and interaction between organizations and the social institutions of American society. Study of the literature and communication ethics and social responsibility. Fee. Pre-requisite: CA 500. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 549</td>
<td>Media Effects</td>
<td>3 cr</td>
<td>A study of the role of corporate and public communication in the American social structure, including mass media extensions and impact upon institutions. Consideration of historical, legal, social, and economic issues. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 555</td>
<td>Corp. and Public Comm. Law</td>
<td>3 cr</td>
<td>A survey of the law as it deals with public communication. The course provides a working knowledge of First Amendment theory, copyright, trademark, advertising, contracts, access and administrative laws as they relate to the public relations environment. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 560</td>
<td>Digital Communication</td>
<td>3 cr</td>
<td>An examination of the new communication technology systems with an emphasis on how they reconfigure patterns of communication organizations, production, storage, and dissemination. The role of communication technology systems today and tomorrow, and implications for organizational, local, national, and international contexts will be studied. Computer fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 561</td>
<td>Teaching &amp; Professionalism</td>
<td>3 cr</td>
<td>This course will explore the practice of teaching and learning. In this course, the primary goal is to help students to make the transition from student to future colleague, thus there will also be a heavy emphasis on professionalization in the communication studies discipline. Pre-requisite: CA 500 Minimum Grade of C. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 570</td>
<td>Audience Dynamics</td>
<td>3 cr</td>
<td>CA 570 explores how audience dynamics (attitudes, feelings, beliefs, experiences, values, needs, and behavior) influence message development in public relations and advertising campaigns. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 575</td>
<td>Investigation of Group Comm.</td>
<td>3 cr</td>
<td>An in-depth analysis of group communication theories. Topics to be covered include decision making, conflict, conformity, leadership, and observation methods. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 576</td>
<td>Historical Perspectives of SC</td>
<td>3 cr</td>
<td>An in-depth study of the field of strategic communication focusing specifically on the cultural history of advertising and public relations, as well as the contemporary issues, problems, and challenges facing these industries. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 570</td>
<td>Cor. and Public Comm. Law</td>
<td>3 cr</td>
<td>An in-depth study of the field of strategic communication focusing specifically on the cultural history of advertising and public relations, as well as the contemporary issues, problems, and challenges facing these industries. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 585</td>
<td>Strat Comm Crisis Mgmt</td>
<td>3 cr</td>
<td>CA 585 is designed to provide graduate students with a working knowledge of public relations crisis management. Course material focuses on actions to take and actions to avoid in handling a crisis situation from a public relations perspective, and how to work with management, employees, affected publics and the media. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 590</td>
<td>Sp Top in Comm -</td>
<td>1 TO 3 cr</td>
<td>A detailed examination of selected topics in communication theory. Topic announced prior to registration. Course may be repeated once when subject matter varies. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 592</td>
<td>Seminar in Comm Theory</td>
<td>1 TO 3 cr</td>
<td>Departmental seminar investigating a selected field of communication theory through in-depth evaluation of its accompanying body of literature. Topic announced prior to registration. Course may be repeated once when subject matter varies. Fee. Pre-requisite: CA 500 Minimum Grade of B. CA 500 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>CA 594</td>
<td>Dir St in Communication -</td>
<td>1 TO 3 cr</td>
<td>Independent research in field, laboratory, or library under the direction of a member of the graduate faculty.</td>
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</tbody>
</table>
CA 595  Project in Communication  1 TO 3 cr
Work on a significant communication problem within the student's area of specialization. Project will involve analysis of the problem, development of significant communication theory applications, and administration of the solution suggested by the analysis. Project will be designed in consultation with the major advisor and approved by the student's project committee. A maximum of three hours of CA 595 may be applied to the student's degree.

CA 599  Thesis  1 TO 3 cr
Students work independently to plan, research, and write results of an original research project. Students must have completed 24 hours of course work before enrolling in this course. Six credit hours of this course is required to complete the MA Thesis Option Degree in Communication. However, no more than 3 credit hours may be taken in any one semester without the expressed permission of the graduate faculty.

## Communication Sciences-Disordr (CSD)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSD 600</td>
<td>Doctoral Colloquium</td>
<td>1 cr</td>
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<td></td>
<td>This seminar is designed to provide a forum for presentation and discussion of faculty and doctoral student research projects. Topics may also include: teaching and learning styles and grant writing. Must be repeated until candidacy is achieved.</td>
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<tr>
<td>CSD 650</td>
<td>Research Methods in CSD</td>
<td>3 cr</td>
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<td>Current methods and strategies used in research of communication processes.</td>
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<tr>
<td>CSD 651</td>
<td>Speech and Hearing Sci &amp; Inst</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Advanced review of the process of speech production, acoustic phonetics, coarticulation, and speech perception with emphasis on laboratory research methods.</td>
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<tr>
<td>CSD 662</td>
<td>Studies in Speech Science</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Basic and advanced principles of the acoustics and physiology of speech production.</td>
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<tr>
<td>CSD 663</td>
<td>Studies in Hearing Science</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Advanced study of psychological and physiological acoustics.</td>
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<tr>
<td>CSD 664</td>
<td>Studies in Language Science</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Intensive study of the theoretical foundations underlying syntax, semantics, pragmatics, phonology, psycholinguistics, neurolinguistics, sociolinguistics, and applied pragmatics.</td>
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<tr>
<td>CSD 665</td>
<td>Studies in Commn Neuroscience</td>
<td>3 cr</td>
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<td></td>
<td>Advanced study of neurosciences as they relate to processes and pathologies of human communication, including functional neuroanatomy and clinical neurology. Interdisciplinary research paradigms will also be discussed.</td>
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</table>

CSD 672  Laboratory in Speech Science  1 cr
Laboratory experiences in speech science.

CSD 673  Laboratory in Hearing Science  1 cr
Laboratory experiences in hearing science.

CSD 674  Laboratory in Language Science  1 cr
Laboratory experiences in language science.

CSD 675  Lab in Communic Neuroscience  1 cr
Laboratory experiences in communication neuroscience.

CSD 682  Seminar in Speech Science  3 cr
Intensive review of current research in speech production. May include normal and disordered processes. Topics may include acoustic phonetics, physiological phonetics, prosody, production and perception, fluency and voice. May be repeated.

CSD 683  Seminar in Hearing Science  3 cr
Intensive literature review of current knowledge and research in hearing and hearing disorders. Topics may include cochlear mechanics, complex signal processing, electrophysiological measures, development of hearing, hearing in the elderly, and hearing in other species. May be repeated.

CSD 684  Seminar in Language Science  3 cr
Intensive literature review of current methods, problems, and strategies in language research. Topics may include normal language acquisition, language-learning disorders, clinical aphasiology, and neurolinguistics. May be repeated.

CSD 694  Directed Study -  1 TO 3 cr
Independent study under the direction of a graduate faculty member. May be repeated. Requires special permission.

CSD 695  Directed Research  1 TO 3 cr
Research under the direction of a graduate faculty member. May be repeated. Requires special permission.

CSD 696  Profess Pract - Administration  2 cr
Supervised professional experiences in administration under the guidance of faculty mentors. May be repeated.

CSD 697  Profess Pract-Clin Supervision  2 cr
Supervised professional experiences in clinical teaching under the guidance of faculty mentors. May be repeated.

CSD 698  Profess Practicum - Teaching  1 TO 5 cr
Supervised professional experiences in academic teaching under the guidance of faculty mentors. May be repeated.

CSD 799  Dissertation Research  1 TO 9 cr
Independent research under the direction of a graduate faculty member. May be repeated. Requires special permission.
Computer Science (CSC)

CSC 108  Introduction to Programming  2 cr
Problem-solving and pre-programming skills developed using hands-on activities in preparation for the introductory programming course.
Pre-requisite: MA 112 Minimum Grade of C or ACT Math 22 or MyMathTest 070.

CSC 120  Prob Solv and Prog Concepts  4 cr
An introduction to the design of algorithms and their implementation in a high-level programming language. Topics include: problem solving strategies, programming concepts, programming environment, control structures, methods, arrays, searching, sorting, object-oriented programming, and file input/output.
Pre-requisite: (MA 113 Minimum Grade of C or MA 172 Minimum Grade of C) or (MA 115 Minimum Grade of C or MA 121 Minimum Grade of C) or (MA 125 Minimum Grade of C or MA 132 Minimum Grade of C) or ACT Math 27 or MyMathTest 090.

CSC 121  Prob Solv and Prog Concepts II  4 cr
Continuation of CSC 120. Topics include: object-oriented programming concepts, abstract data types, graphical user interfaces and event-driven programming, exception handling, text and binary file I/O, and an overview of dynamic data structures.
Pre-requisite: CSC 120 Minimum Grade of C or CIS 120 Minimum Grade of C.

CSC 190  CSC Special Topics -  1 cr
Selected topics in computer science. Prerequisite: Permission of the CSC coordinator.

CSC 228  Digital Logic Computer Arch  3 cr
Topics include: Boolean algebra, minimization techniques, combinatorial and sequential circuit analysis, memory organization, microprocessor concepts, and CPU architecture.
Pre-requisite: CSC 120 Minimum Grade of C.

CSC 231  Intro Data Structures Algs  4 cr
The course will cover techniques to organize and access collections of data, definition, implementation, and use of Classes and Abstract Data Types(ADT). Topics include: stacks, queues, heaps, search trees, recursion, algorithmic complexity, advance searching and sorting algorithms, and graphs and their application to problems.
Pre-requisite: CSC 120 Minimum Grade of C or CIS 210 Minimum Grade of C.

CSC 311  Networking and Communications  3 cr
An introduction to computer networks. Topics include: data transmission, network architectures, file compression algorithms, communication devices and protocols, network routing and flow algorithms.
Pre-requisite: CSC 231 Minimum Grade of C or CSC 230 Minimum Grade of C. CSC 230 can be taken concurrently with this course.

CSC 320  Computer Org-Architect  3 cr
An introduction to computer organization using a top down approach from system component to the register level, internal representation of data, general assembly and linking concepts, addressing modes, and introduction to a specific processor, its architecture and operating system.
Pre-requisite: CSC 228 Minimum Grade of C and CSC 230 Minimum Grade of C or CSC 231 Minimum Grade of C.

CSC 322  Operating Systems  3 cr
This course covers the development of operating systems that control computing systems. Topics include: file systems, process management, scheduling, memory management (real and virtual), security, and concurrency. Case studies of operating systems are examined.
Pre-requisite: CSC 231 Minimum Grade of C.

CSC 324  Database Concepts  3 cr
Introduction to database design and implementation. Aspects of data modeling, database design theory, storage, indexing, and database application development. Entity-relationship model, relational data model, schema refinement, normal forms, file organizations, index structures, and embedded SQL application development.
Pre-requisite: CSC 231 Minimum Grade of C.

CSC 331  Software Engineering Prin - W  3 cr
Models, techniques, and tools used in project management. Topics include: software development process, task scheduling, estimation and progress measurement. Coordination of development teams. Standards, testing plans, configuration management, metrics and use of CASE tools, system delivery and maintenance strategies.
Pre-requisite: (CSC 231 Minimum Grade of C or CSC 230 Minimum Grade of C or CIS 230 Minimum Grade of C) and CA 275 Minimum Grade of C. CA 275 can be taken concurrently with this course.

CSC 332  Adv Data Structures and Algs  3 cr
This course teaches techniques for the design and analysis of efficient algorithms, emphasizing methods useful in practice. Topics to be covered include: mathematical foundations; analytic, empirical, and qualitative evaluation techniques; hash tables; graph algorithms; balanced trees; priority queues; dynamic programming; and divide-and-conquer.
Pre-requisite: CSC 231 and MA 267.
CSC 333  Prog Language Theory  3 cr
Formal examination of programming languages. Formal
Language concepts including syntax and basic grammars
are studied. Language features such as data types and
structures, control structures, and data flow are examined.
The run-time environment and the process of interpretation/comilation are covered. Interpreter and compilation
techniques are introduced.
Pre-requisite: CSC 331 Minimum Grade of C.

CSC 399  Conc and Distributed Comp  3 cr
This course focuses on security issues in concurrent and
distributed systems. Security features in the current advent
of cloud computing are vital. Example topics include secure
multi-threading, agent-based security, security policy
composition, secure compartmentalization and more.
Pre-requisite: CSC 311 Minimum Grade of C and CSC 322
Minimum Grade of C.

CSC 410  Compiler Design-Construction  3 cr
Lexical analysis, syntactic analysis, intermediate code
generation, object code generation, optimization, memory
use, generators for scanners and parsers.
Pre-requisite: CSC 332 Minimum Grade of C and CSC 333
Minimum Grade of C and CSC 320 Minimum Grade of C or
EE 264 Minimum Grade of C.

CSC 411  Comm - Network Analysis  3 cr
Data communications and computer networks. An in-depth
treatment of network architectures and protocols for both
WANS and LANS. Topics include: network routing and flow
algorithms, internet working, and distributed systems.
Pre-requisite: CSC 311 Minimum Grade of C and (CSC 322
Minimum Grade of C or CIS 322 Minimum Grade of C).

CSC 412  Real-Time Software Systems  3 cr
Design and implementation of software for real-time
computer systems. Survey of typical real-time systems;
techniques for code-conversion, error checking, and
transmission monitoring.
Pre-requisite: CSC 311 Minimum Grade of C and CSC 322
Minimum Grade of C and CSC 332 Minimum Grade of C.
CSC 322 can be taken concurrently with this course.

CSC 413  Computer Graphics  3 cr
An in-depth study of hardware and software techniques
used in computer graphics. Study of display and entry
devices, including refresh, storage, and raster scan topics.
Software techniques will include display files, windowing,
clipping, two and three-dimensional transformations, and
hidden-surface removal.
Pre-requisite: (CSC 231 Minimum Grade of C) and (MA 237
Minimum Grade of C or MA 227 Minimum Grade of C).

CSC 414  Modeling and Simulation  3 cr
Analytic and simulation models developed using
deterministic and stochastic techniques. Topics include:
event-driven simulations, queuing theory, Markov
processes, and dynamical systems. “Real World” project
required.
Pre-requisite: (CSC 230 Minimum Grade of C or CIS 230
Minimum Grade of C) and (MA 126 Minimum Grade of C or
MA 233 Minimum Grade of C) and (ST 310 Minimum Grade
of C or ST 275 Minimum Grade of C) or ST 315 Minimum
Grade of C or ST 320 Minimum Grade of C.

CSC 415  Numerical Analysis  3 cr
Mathematical preliminaries, solving linear systems
numerical solution of ordinary and partial differential
equations.
Pre-requisite: (CSC 230 Minimum Grade of C or CIS 230
Minimum Grade of C) and (MA 126 Minimum Grade of C or
MA 233 Minimum Grade of C).

CSC 416  AI Theory and Programming  3 cr
Introduction to basic concepts, implementation techniques,
and philosophies of artificial intelligence and intelligent
systems. Introduction to expert systems, fuzzy logic
systems, neural networks, and techniques for artificial
intelligence programming. The fundamentals of an
AI programming language (LISP or PROLOG) will be
presented. The language will then be used to solve
problems in typical AI applications.
Pre-requisite: CSC 332 Minimum Grade of C or CSC 230
Minimum Grade of C or CIS 230 Minimum Grade of C.

CSC 417  Computer Game Development  3 cr
Introduction to computer game development, including
a variety of related topics. The course will be driven by
research/technical paper discussions, student presentations
and projects. The direction of the course will be guided to
some extent by student interest.
Pre-requisite: CSC 331 Minimum Grade of C or EE 368
Minimum Grade of C.

CSC 418  Adv Game & Simulation Dev  3 cr
This course will cover advanced topics related to the
development of game and simulation software. Topics
include game physics, collision techniques, game
mechanics, level design, artificial intelligence, and security.
Students will design and implement a game or simulation
program that includes elements of artificial intelligence.
Pre-requisite: CSC 417 Minimum Grade of C.

CSC 428  Introduction to Bioinformatics  3 cr
Students in this course will study algorithms pertaining to
bioinformatics (e.g. sequence alignment, biological database
search, and phylogeny reconstruction); gain hands-on
experience using bioinformatics tools; and understand the
interaction of computer science and modern biology within
the context of data-driven knowledge discovery.
Pre-requisite: CSC 230 Minimum Grade of C.
<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>CSC 434</td>
<td>Form Lang - Automata Theory</td>
<td>3 cr</td>
<td>Mathematical preliminaries, languages, context-free grammars, parsing, normal forms, finite automata, regular languages, pushdown automata, Turing machines. Pre-requisite: (CSC 333 Minimum Grade of C or CSC 340 Minimum Grade of C).</td>
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<tr>
<td>CSC 440</td>
<td>Secure Software Engineering</td>
<td>3 cr</td>
<td>The objective of this course is to enhance the security of software by introducing sound security principles that should be incorporated into the software development process. Students will learn a risk management framework and best practices for software security including code reviews, architectural risk analysis, penetration testing, risk-based security test, abuse cases, security requirements, and security operations. Students will also learn common flaws that lead to exploitation and be able to identify and mitigate such errors in practice. Out of class labs and exercises reinforce concepts presented in class. Pre-requisite: CSC 311 Minimum Grade of C and CSC 320 Minimum Grade of C. CSC 320 can be taken concurrently with this course.</td>
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<tr>
<td>CSC 450</td>
<td>Surreptitious Software</td>
<td>3 cr</td>
<td>Students in this course will learn about algorithms for software protection and learn how to use tools for program transformation. Specific topics include obfuscation, watermarking, tamperproofing, birthmarking, and hardware protection. Programming projects will be required in several different languages and course activities will involve preparing student-led lectures, working on programming projects, and writing reports. Pre-requisite: CSC 440 Minimum Grade of C.</td>
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<tr>
<td>CSC 457</td>
<td>Data Warehousing</td>
<td>3 cr</td>
<td>This course focuses on the design, development and usage of data warehouses. Course content includes dimensional modeling, ETL processes, physical design, and analytical processing. New research areas related to data warehousing technology will also be discussed. Pre-requisite: CIS 324 Minimum Grade of C.</td>
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<tr>
<td>CSC 460</td>
<td>Security of HW Implementations</td>
<td>3 cr</td>
<td>The objective of this course is for the student to build upon logic and architectural principles as applied to hardware designs. The key theme of the course is the security impacts of hardware design implementations. Pre-requisite: (CSC 320 Minimum Grade of C or EE 264 Minimum Grade of C).</td>
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<tr>
<td>CSC 485</td>
<td>Cyber-Physical Security</td>
<td>3 cr</td>
<td>This course focuses on the Security of Cyber-Physical Systems (CPS) and Internet of Things (IoT) that go beyond topics commonly considered in Computer and Network Security. This course aims to prepare participants for the cutting edge research undergoing in both areas. The successful participation in this course will require reading number of research papers, presenting learned material, active participation in in-class discussions, and successful accomplishment of a small research project. Pre-requisite: CSC 311 Minimum Grade of C and CSC 322 Minimum Grade of C.</td>
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<tr>
<td>CSC 490</td>
<td>Special Topics</td>
<td>3 cr</td>
<td>Advanced selected topics in computer science. Prerequisite: Permission of the CSC Coordinator.</td>
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<tr>
<td>CSC 510</td>
<td>Compiler Design-Construction</td>
<td>3 cr</td>
<td>Lexical analysis, syntactic analysis, intermediate code generation, object code generation, memory use, generators for scanners and parsers.</td>
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<tr>
<td>CSC 511</td>
<td>Comm-Network Analysis</td>
<td>3 cr</td>
<td>Data communications and computer networks. An in-depth treatment of network architectures and protocols for both WANs and LANs. Topics include: network routing and flow algorithms, internet working, and distributed systems.</td>
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<tr>
<td>CSC 512</td>
<td>Real-Time Software Systems</td>
<td>3 cr</td>
<td>Design and implementation of software for real-time computer systems. Survey of typical real time systems; techniques for code conversion, error checking, and transmission monitoring. Pre-requisite: Computer Science Graduate 030</td>
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<tr>
<td>CSC 513</td>
<td>Computer Graphics</td>
<td>3 cr</td>
<td>An in-depth study of hardware and software techniques used in computer graphics. Study of display and entry devices, including refresh, storage, and raster scan topics. Software techniques will include display files, windowing, clipping, two and three-dimensional transformation, and hidden-surface removal.</td>
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<tr>
<td>CSC 514</td>
<td>Modeling and Simulation</td>
<td>3 cr</td>
<td>Analytic and simulation models developed using deterministic and stochastic techniques. Topics include: event-driven simulations, queueing theory, Markov processes, and dynamical systems. &quot;Real World&quot; project required.</td>
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<tr>
<td>CSC 515</td>
<td>Numerical Analysis</td>
<td>3 cr</td>
<td>Mathematical preliminaries, solving linear systems, numerical solution of ordinary and partial differential equations.</td>
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<td>Course Code</td>
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<td>CSC 516</td>
<td>AI Theory and Programming</td>
<td>3 cr</td>
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<td></td>
<td>Introduction to basic concepts, implementation</td>
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<td>techniques, and philosophies of artificial</td>
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<td>intelligence and intelligent systems. Introduction</td>
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<td>to expert systems, fuzzy logic systems, neural</td>
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<td>networks, and techniques for artificial</td>
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<td>intelligence programming. The fundamentals of an</td>
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<td>AI programming language (LISP or PROLOG) will be</td>
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<td>presented. The language will then be used to</td>
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<td>solve problems in typical AI applications.</td>
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<td>Prerequisite: Graduate Professional Component</td>
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<td>CSC 517</td>
<td>Computer Game Development</td>
<td>3 cr</td>
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<td>Introduction to computer game development,</td>
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<td>including a variety of related topics. The</td>
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<td>course will be driven by research/technical</td>
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<td>paper discussions, student presentations, and</td>
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<td>guided to some extent by student interest.</td>
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<td>CSC 520</td>
<td>Computer Architecture</td>
<td>3 cr</td>
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<td>Instruction set design, pipelining, instruction-</td>
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<td>level parallelism, memory hierarchy design, and</td>
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<td>multiprocessors.</td>
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<td>CSC 522</td>
<td>Performance Eval of Algorithms</td>
<td>3 cr</td>
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<td>Mathematical foundations; analytic, empirical,</td>
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<td>and qualitative evaluation techniques; dynamic</td>
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<td>programming, greedy algorithms, graph</td>
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<td>algorithms; and selected advanced topics.</td>
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<td>CSC 524</td>
<td>Computer Language Design</td>
<td>3 cr</td>
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<td>A study of programming language design and</td>
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<td></td>
<td>specification, including the compiling process,</td>
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<td>parsing, BNF grammars, and models of semantics.</td>
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<td></td>
<td>Differences between interpreters, assemblers,</td>
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<td></td>
<td>and compilers will be studied.</td>
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<td>CSC 525</td>
<td>Complexity Theory</td>
<td>3 cr</td>
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<td></td>
<td>Mathematical preliminaries, languages, finite</td>
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<td></td>
<td>automata, Turing machines, decidability,</td>
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<td>recursive function theory, complexity,</td>
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<td>tractability and NP-complete problems.</td>
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<td>CSC 526</td>
<td>Data Mining</td>
<td>3 cr</td>
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<td>This course provides an in-depth study of data</td>
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<td>mining. Course content includes data preparation,</td>
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<td>feature selection, pattern mining,</td>
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<td>classification, clustering, and sequence mining.</td>
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<td>New research areas in data mining will also be</td>
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<td>discussed. Laboratory assignments will provide</td>
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<td>students with opportunities to interact with and</td>
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<td>develop data mining technologies.</td>
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<td>CSC 527</td>
<td>Software Engineering Princ</td>
<td>3 cr</td>
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<td>Advanced concepts of software engineering will</td>
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<td>be discussed. Program testing techniques</td>
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<td></td>
<td>including: structured design and walk throughs,</td>
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<td>proving program correctness and verifiability,</td>
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<td>and system coding standardization and integration</td>
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<td>will be covered in depth. Software team</td>
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<td>formulation and management techniques will be</td>
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<td>discussed.</td>
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<td>CSC 528</td>
<td>Introduction to Bioinformatics</td>
<td>3 cr</td>
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<td></td>
<td>Bioinformatics is a highly interdisciplinary</td>
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<td></td>
<td>course between computer science and biology.</td>
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<td></td>
<td>It focuses on the analysis of proteins, genes,</td>
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<td></td>
<td>and genomes using computing technologies such as</td>
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<td></td>
<td>computer algorithms and computer databases.</td>
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<td>Students in this course will learn algorithms</td>
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<td>and databases pertaining to bioinformatics (e.g.,</td>
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<td>sequence alignment, suffix tree and its</td>
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<td>biological/biomedical applications, genome</td>
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<td>alignment, biological/biomedical database search,</td>
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<td>and phylogeny reconstruction); gain knowledge</td>
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<td>and hands-on experience of bioinformatics tools;</td>
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<td>understand the interaction between computer</td>
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<td>science (in particular, semantic technologies)</td>
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<td>and modern biology within the context of data-</td>
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<td>driven knowledge discovery.</td>
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<td>CSC 532</td>
<td>Distributed Systems</td>
<td>3 cr</td>
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<td>This course will further enhance the students</td>
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<td>understanding of the details of how an</td>
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<td>operating system functions. It will focus on the</td>
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<td>advanced concepts associated with distributed</td>
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<td>systems. The student will learn the underlying</td>
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<td>concepts of such systems and the algorithms</td>
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<td>needed to provide the required synchronization</td>
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<td></td>
<td>and communication. Pre-requisite: Computer</td>
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<td></td>
<td>Science Graduate 030</td>
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<td>CSC 533</td>
<td>Art Intel-Heuristic Prog</td>
<td>3 cr</td>
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<td>Methods of heuristic programming, the production</td>
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<td>of intelligent algorithms, and simulation of</td>
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<td>human cognitive processes will be studied. AI</td>
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<td>languages, such as LISP and PROLOG, will be</td>
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<td>discussed. Attention placed on the relationship</td>
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<td>between man-made machines (robots) and</td>
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<td>biological organisms with natural intelligence.</td>
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<td>Expert Systems and neural network research will</td>
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<td>be studied.</td>
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<td>CSC 550</td>
<td>Surreptitious Software</td>
<td>3 cr</td>
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<td>Students in this course will learn about</td>
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<td>Algorithms for software protection and learn how</td>
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<td>to use tools for program transformation. Specific</td>
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<td>topics include obfuscation, watermarking,</td>
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<td>tamperproofing, birthingmarking and hardware</td>
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<td>protection. Programming projects will be</td>
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<td>required in several different languages and</td>
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<td>course activities will involve preparing</td>
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<td>student-led lectures, working on programming</td>
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<td>projects, and writing reports.</td>
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<td>CSC 557</td>
<td>Data Warehousing</td>
<td>3 cr</td>
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<td>This course focuses on the design, development</td>
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<td>and usage of data warehouses. Course content</td>
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<td>includes dimensional modeling, ETL processes,</td>
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<td>physical design, and analytical processing. New</td>
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<td>research areas related to data warehousing</td>
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<td>technology will also be discussed.</td>
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<td>CSC 560</td>
<td>Security of HW Implementations</td>
<td>3 cr</td>
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<td>The objective of this course is for the student</td>
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<td>to build upon logic and architectural principles</td>
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<td>as applies to hardware designs. The key theme</td>
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<td>of the course is the security impacts</td>
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<td>of hardware design implementations.</td>
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CSC 580  Data Security  3 cr
The objective of this course is to introduce the inherent strengths and limitations of cryptography in data security applications, focusing on the basic principles of message privacy, key negotiation, and key management. The course covers various aspects of symmetric and asymmetric ciphers and provides a broad coverage of the core areas for engineering cryptographic systems. Students will be expected to implement and analyze simple cryptographic schemes and read supporting articles and papers for presentation. Prerequisite: CIS Graduate Professional Component.

CSC 582  Network Security  3 cr
The objective of this course is to provide students with the knowledge and skills to begin supporting network security within an organization. Students will gain an understanding of fundamental network security concepts and mechanisms, be able to identify security threats and vulnerabilities, and help respond to and recover from security incidents. The course will provide an understanding of how to design and build secure network algorithms and environments while gaining an in-depth knowledge of protocol security, intrusion detection, and principles of cyber defense. Prerequisite: CSC 580 Minimum Grade of C.

CSC 585  Cyber-Physical Security  3 cr
This course focuses on the Security of Cyber-Physical Systems (CPS) and Internet of Things (IoT) that go beyond topics commonly considered in Computer and Network Security. This course aims to prepare participants for the cutting edge research undergoing in both areas. The successful participation in this course will require reading number of research papers, presenting learned material, active participation in in-class discussions, and successful accomplishment of a small research project.

CSC 590  CSC Sp Top -  3 cr
Advanced selected topics in computer science. Prerequisite: Permission of the CSC coordinator.

CSC 595  CS Project Proposal Develop  1 TO 3 cr
Development of the project proposal for the Computer Science specialization master's project. Prerequisite: Graduate Professional Component and Permission of the Director of Graduate Studies. Pre-requisite: CIS 518 Minimum Grade of S.

CSC 598  Computer Science Project  1 TO 3 cr
This course may be repeated for a maximum of six (6) credits. A CIS project committee will provide direction during the project. Prerequisites: Approval of project proposal by student's project committee and permission of the Director of CIS Graduate Studies. Pre-requisite: CSC 595 Minimum Grade of B.

CSC 612  Cybersecurity  3 cr
This course focuses on developing expertise and preparation for independent research in Cybersecurity through an in-depth review of the Cybersecurity literature. The student will be conversant in broad issues and trends in Cybersecurity as defined by skill sets and occupations.

CSC 626  Advanced Big Data  3 cr
This course focuses on developing expertise and preparation for independent research in big data through an in-depth review of the big data and data science literature. The student will be conversant in broad issues and trends in big data as defined by current tools and technologies.

Computer And Inform Sciences (CIS)

CIS 150L  Intro to Comp Applications Lab  0 cr
Laboratory course for CIS 150, Introduction to Computer Applications.

CIS 250L  Adv Comp Applications Lab  0 cr
Laboratory course for CIS 250, Advanced Computer Applications. Pre-requisite: CIS Proficiency Exam P or CIS 150 Minimum Grade of C.

CIS 010  Computer Proficiency Exam  0 cr
The purpose of this course is to administer the Computer Proficiency Exam (CPE) for enrolled students. The CPE consists of multiple choice and performance-based questions for general computer, internet, WWW, e-mail, and office application concepts. Performance-based questions require a series of actions in a simulated environment to demonstrate specific skills being assessed. No outside materials or assistance from the applications' Help files are allowed.

CIS 101  Freshman Seminar CIS  2 cr
A course for first-time students that assists with maximizing the student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by college life for a major in the School of CIS. Taught in small groups, the course provides an introduction to the nature of higher education and a general orientation to the functions and resources of the University and the School of CIS. Extensive reading and writing assignments relevant to the student's first year experience are required.

CIS 110  Intro to Comp-Info Sciences  3 cr
An introduction to information technology using a programming language to study applications in text searching, in real-time 3-D animation, and in sound production. A discussion of the social, ethical, economic, and philosophical implications of computing.
CIS 115  Beginning Programming  4 cr
A first course in programming using a visual, event-driven programming language. Coverage includes algorithmic problem solving, fundamentals of programming, procedures, decisions, repetition, and arrays.
Pre-requisite: MyMathTest 080 or ACT Math 23 or (MA 112 Minimum Grade of C or MA 171 Minimum Grade of C) or MA 267 Minimum Grade of C or (MA 125 Minimum Grade of C or MA 132 Minimum Grade of C).

CIS 150  Intro to Computer Applications  3 cr
This course is designed to provide a broad based introduction to the use of computers and productivity software technologies. Topics to be covered include: use of a current Operating System and basic file management; the fundamentals of word processing, spreadsheet and graphics-based presentation software; and basic image management related to documents and reports. Other topics covered include information assurance and computing safety as related to PC/Internet usage.

CIS 155  Educational & Social Computing  3 cr
This course provides a hands-on approach that focuses on the use of current and emerging computing technologies. Topics include: Use of the University adopted Learning Management System (LMS), Google Apps, Google Docs, safe computing practices, and current trends in social networking.

CIS 190  Special Topics-  1 TO 3 cr
Selected topics in computer and information sciences. Requires permission of Specialization Coordinator.

CIS 210  Intro to C++ Programming  3 cr
Introduction and fundamentals of C++ programming, input-output operations, variables, data types, arithmetic expressions, control statements, looping, functions, arrays, pointers, strings, structures, and abstract data types. Pre-requisite: MA 125 Minimum Grade of C. MA 125 can be taken concurrently with this course.

CIS 211  Advanced C++ Programming  1 cr
Advanced concepts in C++ programming, constructors, destructors, classes and operation overloading. Pre-requisite: (CIS 121 Minimum Grade of C or CIS 210 Minimum Grade of C).

CIS 227  Numerical Computation I  3 cr
Floating point numbers, representation, and errors; software tools for scientific computing; elementary problems in scientific computing. Pre-requisite: MA 126 Minimum Grade of C or MA 233 Minimum Grade of C.

CIS 235  Programming Language Seminar  3 cr
Fundamentals of syntax and style for a relevant, or current programming language. Includes application development in that language. Recommended: Knowledge of a programming language.

CIS 250  Advanced Comp Applications  3 cr
This course is designed to provide continuing, advanced coverage of productivity software technologies. Topics to be covered include: use of a current Operating System and basic file management; the fundamentals of word processing, spreadsheet and graphics-based presentation software; and basic image management related to documents and reports. Other topics covered include information assurance and computing safety as related to PC/Internet usage.
Pre-requisite: CIS 150 Minimum Grade of C or CIS Proficiency Exam P or CIS 010 Minimum Grade of S.

CIS 300  Information Tech in Society  1 cr
A discussion of personal, local, national, and global impact of information technology on ethical, legal, and social issues. Requires Junior standing in the School of Computing.

CIS 321  Data Comm and Networking  3 cr
An introduction to data communications, computer networking and network operating systems. Topics include: basic concepts of data transmission, network architectures, communications devices, and communication protocols. Pre-requisite: ISC 245 Minimum Grade of C or ITE 271 Minimum Grade of C or CIS 120 Minimum Grade of C or CSC 120 Minimum Grade of C.

CIS 324  Database Design-Dev-Mgt  3 cr
Analysis, design, and development of desktop database systems. Coverage of normalization concepts, DBMS models, E-R/Semantic modeling, and query processing. Pre-requisite: ( (MA 112 Minimum Grade of C or MA 171 Minimum Grade of C) or (MA 120 Minimum Grade of C or MA 287 Minimum Grade of C) or MA 267 Minimum Grade of C or (MA 125 Minimum Grade of C or MA 132 Minimum Grade of C) or ACT Math 23 ) or MyMathTest 080 and (ISC 245 Minimum Grade of C or ITE 271 Minimum Grade of C) or (CSC 121 Minimum Grade of N or CIS 121 Minimum Grade of C).

CIS 401  Accelerated Programming  3 cr
This course presents programming concepts in an accelerated manner. Coverage includes ADT's, Classes and Class Libraries, and simple data structures such as linked lists, stacks, queues. Laboratory assignments will be done in a high level, object-oriented language. This course does not count towards a graduate degree in CIS. Requires prior programming experience and permission of Coordinator.

CIS 402  Accelerated OS-Comp Arch  3 cr
This course presents computer architecture and operating systems concepts in an accelerated manner. Coverage includes machine and assembly languages, functioning of a simple processor, machine level data flow, microprogramming, I/O, interrupts and processing drivers, memory management, dynamic process scheduling, and multi-tasking. This course does not count toward a graduate degree in CIS. Requires prior programming experience desired and permission of Coordinator.
CIS 403  Accelerated Data-File Structs  3 cr
This course applies advanced programming concepts and techniques to data structures such as linear and linked list trees, records, files, and database. Sequential and random access file processing methods; searching and sorting methods. Laboratory assignments will be done in a high-level, object-oriented language. This course does not count toward a graduate degree in CIS.
Pre-requisite: CIS 121 Minimum Grade of B or CIS 123 Minimum Grade of B or CIS 142 Minimum Grade of B or CIS 401 Minimum Grade of B or CIS 501 Minimum Grade of B.

CIS 439  Windows Programming  3 cr
This course continues and expands the study of programming begun in either ITE 285 or CIS 121. Concepts previously learned are extended to application programming in the windows (GUI) environments. Students will make use of the OLE, DDE, API features of windows in programming projects. Students will write and use their own DLL’s in producing user interfaces and applications projects.
Pre-requisite: CIS 230 Minimum Grade of C or CIS 263 Minimum Grade of C or ITE 285 Minimum Grade of C or ITE 451 Minimum Grade of C or Computer Science Graduate 030.

CIS 490  CIS Sp Top -  3 cr
Advanced selected topics in computer and information sciences. Requires permission of the specialization coordinator.
Pre-requisite: Computer Sci Prof Component 30

CIS 494  Directed Studies  1 TO 3 cr
May be taken for a maximum of six credits, only three of which may be applied to the CIS major or minor. Requires permission of the specialization coordinator.

CIS 496  CIS Internship  0 TO 3 cr
CIS internship program is designed to give advanced students practical experience in the computer industry. Students will work on sponsored projects with faculty advisors. Credit may apply to degree with approval of the Dean. Requires GPA 2.75 or higher and permission of the Dean.

CIS 497  Senior Capstone Experience-W  3 cr
A comprehensive team project will be completed and documented. Writing assignments will reinforce the importance of life-long learning, leadership skills, and the ethical issues of computing as well as appropriate resume and job application cover letter creation. Oral and written reports will be required. This course is to be taken the final semester of the student’s degree program. Requires application for graduation filed the semester before registering for the course. Completion of the following courses according to major: Computer Science-CSC 333 and CSC 340; Information Systems-ISC 360; Information Technology-ITE 370.
Co-requisite: CIS 498
Pre-requisite: (EH 372 Minimum Grade of C or EH 373 Minimum Grade of C) and (CSC 331 Minimum Grade of C or CSC 340 Minimum Grade of C or ISC 360 Minimum Grade of C or ITE 370 Minimum Grade of C).

CIS 498  CIS Senior Seminar  0 cr
A series of mini-seminars designed to prepare graduating seniors for transition to professional careers in computing or graduate study and to assess student learning outcomes in the curriculum. Mini-seminars would include, but would not be limited to: resume development, interviewing tips and techniques, career planning, professionalism and ethics in the workplace, and advanced graduate study and professional development. Each student will be required to complete one or more senior exit exams and a senior exit survey. Prerequisite: Computer Science: CSC 331; Information Systems: ISC 360; Information Technology: ITE 370.
Co-requisite: CIS 497
Pre-requisite: CIS 497 Minimum Grade of C and (CSC 331 Minimum Grade of C or ISC 360 Minimum Grade of C or ITE 370 Minimum Grade of C). CIS 497 can be taken concurrently with this course.

CIS 499  CIS Senior Honors Project - H  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of computing, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior honors project will be judged and graded by three faculty chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to 6 credit hours. Requires completion of an approved project prospectus and permission of the appropriate Coordinator.
Pre-requisite: Computer Sci Prof Component 30

CIS 518  CIS Research Methodologies  3 cr
A review of computer and information science literature and research topics. Techniques for defining research goals will be described. Students will be expected to identify a research area and conduct a complete review of the literature.
CIS 530  Information Assurance/IT Audit  3 cr
This course covers the understanding and managing of risks and threats to information and information systems. This includes protecting and defending information and information systems by ensuring through authorization and other means concepts such as accessibility, secrecy, reliability, and authentication.

CIS 535  Digital Forensic Analysis  3 cr
This course provides students with advanced tools, techniques, and methodologies for accumulating, securing, analyzing, managing, and reporting evidence related to a forensics examination. The professional communication and presentation of the results of forensic investigations will be emphasized.
Pre-requisite: Computer Science Graduate 030

CIS 538  OS Concepts and Security  3 cr
This course examines the concepts of operating systems such as memory and virtual memory management, as well as processor, process, device, and file management. Topics include the management and organization of network operating systems and operating system security and ethics. Students will manage, configure, and secure operating systems such as Windows, Unix, and Linux in laboratory environments.
Pre-requisite: Computer Science Graduate 030

CIS 539  Windows Programming  3 cr
The practice and principles of developing interactive desktop computer applications. Aspects to be covered will include graphical user interface; use of sophisticated widget, container, and utility libraries; event-driven programming; two-dimensional graphics; in-memory database; and deployment.

CIS 540  Network Security Management  3 cr
This course examines network and web security issues including: risks and threats, system access points, hardware and software defense methods, and organizational security policies. The course will cover the analysis of systems for vulnerabilities, the implementation of security procedures, the monitoring of systems for security breaches, and the recovery or restoration of breached systems.

CIS 590  CIS Sp Top -  3 cr
Advanced selected topics in computer and information sciences. Requires permission of the CSC Coordinator

CIS 594  Directed Studies -  1 TO 3 cr
May be taken for a maximum of three credits to count toward the degree. Requires permission of the Director of Graduate Studies.

CIS 595  CIS Research Development  1 TO 3 cr
Development of the research proposal for master's thesis. Graduate Professional Component. Requires permission of the Director of Graduate Studies.
Pre-requisite: CIS 518 Minimum Grade of S.

CIS 596  CIS Graduate Internship  0 TO 3 cr
CIS graduate internship program is designed to give graduate students practical experience in the computer industry. Students will work on sponsored projects with faculty advisors. Up to three hours may be counted toward the degree. Requires permission of the Director of Graduate Studies.

CIS 597  CIS Graduate Seminar  0 TO 1 cr
This course prepares graduate assistants in the School of CIS to provide support and assistance to faculty for instruction in School of CIS classes. Topical coverage includes but is not limited to: graduate assistant expectations and responsibilities, protection of student educational information (FERPA), practical skills in assisting in computing instruction, graduate assistant best practices, and tips from faculty and experienced graduate assistants. This course does not count towards a graduate degree in CIS. Requires permission of the Director of CIS Graduate Studies.

CIS 598  CIS Project  1 TO 3 cr
Approved investigation of original problems under direction of a faculty member. This course may be repeated for a maximum of three hours of credit towards the degree. Requires permission of the Director of Graduate Studies.

CIS 599  CIS Thesis  1 TO 9 cr
This course may be repeated for a maximum of six credits. A thesis committee will provide direction during the thesis. Requires approval of the thesis project by graduate faculty and the Director of Graduate Studies. Pre-requisite: CIS 595 Minimum Grade of B.

CIS 694  Directed Study -  3 cr
This course focuses on the development of the doctoral prospectus leading to the defense of a dissertation.

CIS 799  Dissertation  1 TO 9 cr
This course focuses on the development of the dissertation.

Counselor Education (CED)

CED 560  Diagnosis/Treatment Planning  3 cr
The Diagnostic and Statistical Manual of Mental Disorders (DSM) is used to develop a basic understanding of mental disorders. Students learn to utilize the DSM classification system to identify counseling techniques and develop counseling plans.

CED 561  Marriage and Family Counseling  3 cr
The theories, principles, and techniques of counseling couples and families are examined. Other topics include ethical and multicultural issues, assessment, and current research in marriage and family counseling.
CED 562  Addictions Counseling  3 cr
This course provides an overview of research and theory in regards to the etiology, assessment, diagnosis and treatment of addictive disorders, e.g. alcoholism, drug addiction, gambling, etc. The course will review theoretical and evidence-based models of counseling for addictive disorders as well as considerations for treating addictive disorders among various special populations and with culturally diverse clients.

CED 563  Divorce Mediation  3 cr
This course will introduce students to the techniques of divorce mediation. Legal, ethical and psychological issues in the divorce mediation process will be examined with special emphasis on the neutral role of the mediator explored.

CED 564  Gerontological Counseling  3 cr
Emphasis is on a basic knowledge of the theories, principles and techniques of counseling elderly individuals, couples and their families. Includes such topics as assessment, ethical and cultural issues, model programs, and current research in gerontological counseling.

CED 565  Found of Prof School Couns  3 cr
Provides an overview of the history, philosophical foundations, and professional duty of professional school counseling. Review of historical and contextual forces that shaped the evolution of professional school counselors’ roles and functions within schools. Special emphasis will be placed on current trends and best practices as identified by ASCA and current literature.

CED 566  Multicultural Counseling  3 cr
Includes a study of historical and current theories and issues in multicultural counseling, provides an understanding of societal trends and changes, and demonstrates strategies/techniques for cross-cultural counseling techniques through class exercises, case studies, and demonstrations. Reflective experiences are used to allow for the development of cultural self-knowledge.

CED 567  Couples Counseling  3 cr
This course will provide an overview of various theoretical approaches and related research findings for couples counseling. The course will also provide an overview of current theory and research in human sexuality, including sexual development, sexual well-being/wellness, sexual orientation and sexual dysfunction and disorders. The course will apply particular focus to sexuality issues as they are an aspect of individual and couples counseling work.

CED 568  Comm Mental Health Counseling  3 cr
This course examines community mental health counseling and includes a survey of its organizational, fiscal, and legal dimensions; of community needs assessment, program delivery, advocacy, funding, and intervention; of the principles of consultation, education and outreach; of client and community characteristics; and of the various practice settings and roles.

CED 569  Child Counseling  3 cr
This course provides an overview of current theoretical perspective and evidence-based intervention paradigms regarding psychological, behavioral, cultural and social context/environmental problems commonly occurring during childhood and adolescence. A focus will be upon knowledge of basic counseling skills for use with children and adolescents as well as learning to conceptualize childhood problems at various levels of social ecology: individual, cultural, academic, familial, community and societal.

CED 571  Foundations of CMHC  3 cr
This course is an introduction to the historical and philosophical foundation of Clinical Mental Health Counseling as well as overview of contemporary clinical practice issues within this counseling specialty.

CED 572  Princ and Theories of Couns  3 cr
Includes a study of various theories, principles, and techniques in counseling. Opportunity is provided for the implementation of counseling techniques through the study of case studies and transcripts.

CED 573  Ed Occup Info Sys - Mats - Res  3 cr
The study of educational, vocational, psychological, and individual resources needed to make employment decisions. Emphasis is on the collection and evaluation of information, procedures and strategies for researching employment opportunities, and the management of information services.

CED 574  Group Couns Theory and Process  3 cr
Includes both the theory and practice of group counseling, counseling with clients of diverse backgrounds, and selecting group work suitable to multicultural needs. Emphasis is on the developmental level and background of clients with which the counselor expects to work.

CED 575  Intro to Community Rehab  3 cr
Introduces the student to a broad field of community rehabilitation. Included is the history, philosophy, present activities and future trends in rehabilitation. A multidisciplinary approach to the study of the "whole person" is emphasized and direct contact with community social service agencies is an integral part of the course.

CED 576  Supv Practicum in Couns  3 cr
This course requires the student to demonstrate the appropriate use of a variety of counseling skills and techniques. Audio and video tapes of individual counseling sessions are critiqued in class by the instructor. Requires special permission of the instructor. Pre-requisite: (CED 571 Minimum Grade of B or CED 565 Minimum Grade of B) and CED 586 Minimum Grade of B and CED 572 Minimum Grade of B and CED 574 Minimum Grade of B and CED 566 Minimum Grade of B and CED 584 Minimum Grade of B.
CED 578  Supv Pract-Group Counseling  3 cr
Supervised practice is provided in group counseling and
other group work experience appropriate for a counselor.
Practicum experience is offered in the setting in which the
student plans to work.

CED 579  Soc and Psych Asp of Disabil  3 cr
The theory, research, and practices in related disciplines
which contribute to an understanding of human disability.
Field work and case study serve as integrating activities.

CED 580  Student Personnel Services  3 cr
Included is a survey of historical developments and current
practices in student personnel services in post-high school
educational institutions. The organization, administration,
and functions of the various services are stressed.

CED 581  Rehab Case Management  3 cr
This course provides for critical analysis of representative
rehabilitation case studies. Case records are used as a
basis for developing an understanding of the clients with
handicaps and their problems, the rehabilitation case
work process, diagnosis, eligibility requirements, and the
provision of services.

CED 582  Data-Driven School Counseling  3 cr
Provides an overview of how school counselors can
access, interpret, and use achievement data, demographic
data, school process data, and perception data to inform
school counseling programmatic decisions. Assessment of
systemic data, using data to guide program development,
formative and summative evaluation methods, and
strategies for dissemination of data are reviewed.

CED 583  Indiv and Group Testing Lab  3 cr
Supervised experience in the selection, administration, and
scoring of educational and psychological tests, and the
interpretation and reporting of test results.
Pre-requisite: EPY 555 Minimum Grade of B.

CED 584  Sem Ethical and Legal Issues  3 cr
Ethical standards of the profession and current legal issues
will be examined in the context of case studies and current
literature. Critical analysis by each student of legal and
ethical issues faced by counselors and psychometrists will
be stressed.

CED 585  Medical Aspects of Rehab  3 cr
Common symptomology, treatment, and medical
management techniques of rehabilitation and physical
medicine are emphasized. Other topics include assessment
of client's functional limitations, interpretation of medical
information, and planning for the client's rehabilitation.

CED 586  Counseling Skills and Process  3 cr
Emphasis is placed on the counseling procedures involved
in developing and maintaining the therapeutic relationship.
Students are required to model the basic skills of counseling
using videotaped incidents and observations for feedback
on skill development.

CED 588  Career Devel, Assess, & Interv  3 cr
Emphasis is placed on a basic knowledge of the theories,
principles, and techniques of career counseling used for
a wide range of ages. Other topics include model career
development programs, assessment, population and age
diversity, individual characteristics, placement and current
research.

CED 590  Special Topics -  3 cr
Guided supervision in the completion of learning tasks in
counselor education such as program design and revision
study of a significant topic, theory, model and supervision
of selected learning activities to acquire specific counseling
and testing skills.

CED 591  Advocacy, Collab. & Consult.  3 cr
This course will provide an overview of advocacy,
collaboration and consultation models and essential skills
for professional school counselors and clinical mental
health counselors. The role that each of these skills play
in the professional identity of the school and mental health
counselor and strategies for using these skills to promote
systemic change and equitable social systems will be
examined.

CED 592  Crisis & Trauma Counseling  3 cr
Students will gain knowledge of research-informed
theoretical models of etiology and development of problems
such as suicidality and other forms of mental health crisis,
as well as grief, trauma, and disaster-related mental health
symptoms. Students will also gain knowledge of evidence-
based models of counseling and intervention in these
areas such as comprehensive risk assessment strategies,
psychological first aid and systems of mental health crisis
management.

CED 594  Dir St and Research  1 TO 3 cr
Students explore through directed study problems and
issues of special interest or significance in Counselor
Education. Not more than three semester hours of any
departmental 594 courses can be accepted toward a degree
program.

CED 595  Internship - School Counseling 1 TO 9 cr
The internship is a supervised learning experience in a work
setting similar to that in which a school counselor eventually
will be employed. The internship provides the student with
an opportunity to apply the theories and concepts learned
during the graduate program. Not more than 12 hours may
be taken. Prerequisite: Special permission of the instructor
and a grade of B or above in CED 586 and CED 576.
Pre-requisite: (PRAXIS- Prof School Counselor 156 ) and
CED 576 Minimum Grade of B and CED 586 Minimum
Grade of B and CED 584 Minimum Grade of B.
CED 596 Internship-School Psychometry 1 TO 9 cr
The internship is a supervised learning experience in a work setting similar to that in which a school psychometrist eventually will be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate program. Not more than 12 hours may be taken. Requires special permission of the instructor.
Pre-requisite: EPY 556 Minimum Grade of B and CED 584 Minimum Grade of B and EPY 558 Minimum Grade of B and CED 583 Minimum Grade of B.

CED 597 Internship in CMHC 1 TO 9 cr
The internship is a supervised learning experience in a work setting similar to that in which a community counselor eventually will be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate program. Not more than 12 hours may be taken. Requires special permission of the instructor.
Pre-requisite: CED 576 Minimum Grade of B and CED 584 Minimum Grade of B and CED 586 Minimum Grade of B.

CED 598 Internship-Rehab Counseling 1 TO 9 cr
The internship is a supervised learning experience in a work setting similar to that in which a rehabilitation counselor eventually will be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate program. Not more than 12 hours may be taken. Requires special permission of the instructor.
Pre-requisite: CED 576 Minimum Grade of B and CED 584 Minimum Grade of B and CED 586 Minimum Grade of B.

CED 599 Thesis 1 TO 9 cr
A student selects a project, study or investigation which is related to an area of specialization in Counselor Education. The project forms a basis for the thesis. A thesis committee will provide direction during the writing of the thesis.

CED 672 Adv Couns Theory and Practice 3 cr
An advanced study of counseling theories and strategies as they apply to practical situations and special populations. Pre-requisite: CED 572 Minimum Grade of B.

CED 674 Adv Theory and Pract Grp Couns 3 cr
This course provides the student with advanced skills and knowledge designed to facilitate working with groups. The course emphasizes group theory, research, and participation in group dynamics.
Pre-requisite: CED 574 Minimum Grade of B.

CED 676 Advanced Practicum-Counseling 3 cr
Supervised field experience in appropriate settings. Required weekly seminar. Requires special permission of the instructor.

CED 678 Negotiation Training 3 cr
This course focuses on the development of negotiation, conflict resolution, and communication skills needed to be effective in resolving a variety of training-related problems. Students will have an opportunity to research and practice in the negotiation process by applying communication and conflict resolution techniques in simulated and real situations.

CED 690 Sp Top - 3 cr
Guided supervision in the completion of learning tasks in counselor education such as program design and revision, study of a significant topic, theory, model, and supervision of selected learning activities to acquire specific counseling and testing skills.

CED 694 Dir St and Research 1 TO 3 cr
Students explore through directed study problems and issues of special interest or significance in Counselor Education. Not more than three semester hours of any departmental 694 courses can be accepted toward a degree program.

CED 699 Research Project 3 cr
A supervised field project, or investigation in the Counselor Specialist Program, serving as the culminating experience in the program. Applying concepts and skills learned during the sixth-year program, the student will conduct an investigation and prepare a field project report in standard form. Pre-requisite: CED 576 Minimum Grade of B.

Criminal Justice (CJ)

CJ 105 Intro to Criminal Justice 3 cr
An overview of crime in the U.S. and the three major criminal justice agencies: law enforcement, courts, and corrections. CJ majors must pass with a grade of "C" or better.

CJ 210 Policing and Society 3 cr
An overview of the police functions in U.S. society, including law enforcement, maintenance of order, and public services and police responsibilities, including organizational and managerial aspects of policing in our democracy. Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

CJ 215 Correctional Policies and Proc 3 cr
An overview of the policies and procedures of U.S. correctional systems, and the methods of treatment of offenders. Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

CJ 223 Intro to Forensic Science 3 cr
Survey of scientific crime detection methods; crime scene search, identification and preservation of evidence; uses of the laboratory for criminal investigation.
**CJ 310 Research Methods-W 3 cr**
This course examines research methodologies in the social sciences, covering the tools and techniques for designing and conducting research, including collecting and analyzing data, and presenting findings. (Cross-listed as PSC 310).
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

**CJ 321 Public and Private Security 3 cr**
An overview of security in modern society, including public and private security, covering the role and administration of security and security personnel.
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C).

**CJ 330 Judicial Process 3 cr**
The study of U.S. judicial process at both the federal and state court levels. (Cross-listed as PSC 330)
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C).

**CJ 331 Constitutional Law 3 cr**
The study of the principles of constitutional powers and liberties examined through a analysis of decisions and opinions by the U.S. Supreme Court. (Cross-listed as PSC 331)
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C.

**CJ 332 Criminal Law 3 cr**
An overview of what constitutes crime and of the body of law governing the punishment of crime.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C.

**CJ 336 The Law and Legal Theory 3 cr**
Explores issues and problems in the area of law, including the nature and rule of law, the aims and roles of legal systems, morality and law, obligations to obey to law and systematic injustices related to race, ethnicity, and gender. (Cross-listed as PHL 336)
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C).

**CJ 337 Liability and Punishment 3 cr**
Explores theoretical issues and problems in the areas of law--especially criminal law--concerning liability and punishment. Topics to be examined include diminished capacity, theories of punishment, and capital punishment. (Cross-listed as PHL 337)
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C.

**CJ 360 Theories of Offending 3 cr**
A study of theories of criminal behavior and delinquent behavior.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

**CJ 363 Crime and Politics in Latin Am 3 cr**
An examination of the violent crime epidemic affecting many parts of Latin America, with specific focus on the themes of democratic transition, political economy, and foreign relations with the United States. Same as PSC 363 and IS 363.
Pre-requisite: (PSC 130 or CJ 105 or IS 100).

**CJ 372 Gender and Criminal Justice 3 cr**
This course examines the experiences of women in the criminal justice system--as criminals, as crime victims, and as criminal justice professionals--together with social values and institutions that shape perceptions and outcomes.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or GS 101 Minimum Grade of C.

**CJ 374 Race, Ethnicity, and Crim Just 3 cr**
The study of the role and impact of race and ethnicity in the development and evolution of the criminal justice system. Topics include criminal victimization, the treatment of criminal offenders, and the impact of race and ethnicity on those in the criminal justice system.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

**CJ 380 Drugs and Crime 3 cr**
An examination of different types of illegal and legal drugs, their effects on the human body including additions, and the relationship of drug abuse and crime.
Pre-requisite: CJ 105 or CJ 205.

**CJ 390 Special Topics - 3 cr**
Study of a significant topic or problem in criminal justice. May be repeated up to two time when content varies.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

**CJ 403 Sexual Violence 3 cr**
This course focuses on the perpetration and experience of sexual violence in the United States and incorporates perspectives from criminal justice, gender studies, sociology, and psychology.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or GS 101 Minimum Grade of C.

**CJ 411 Criminal Justice Admin 3 cr**
This course applies classical and modern management and organization theories to broad range of institutions, actors, and agencies, including police, courts and corrections, as well as drug traffickers, sexual offender treatment centers, and homeland security agencies.
Pre-requisite: (CJ 105 or CJ 205 or PSC 130).

**CJ 422 Criminal Investigations 3 cr**
An overview of the processes used by criminal investigators and the roles of those involved in the judicial process, as well as the interaction that occurs between the police, prosecutors, defense attorneys and the judiciary.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.
CJ 430 Criminal Procedure - W 3 cr
An overview of the processes used by criminal investigators and the roles of those involved in the judicial process, as well as the interaction that occurs between the police, prosecutors, defense attorneys and the judiciary.
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CJ 440 Community Based Corrections-W 3 cr
Examine alternatives to incarceration for offenders with emphasis on current research.
Pre-requisite: (CJ 105 Minimum Grade of C or PSC 205 Minimum Grade of C) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CJ 455 Juvenile Justice Admin Policy 3 cr
An examination of the policies, programs, and practices of crime involving youth and the administration of juvenile justice.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

CJ 469 Criminal Justice Policies 3 cr
This course examines how public policy has shaped both the criminal justice system and its results, with particular emphasis on crime control.
Pre-requisite: CJ 105 Minimum Grade of C or PSC 130 Minimum Grade of C or CJ 205 Minimum Grade of C.

CJ 471 Criminal Justice and Community 3 cr
A presentation of current research on a wide range of topics that impact on the relationship of police and the community.
Pre-requisite: (CJ 105 Minimum Grade of C or PSC 205 Minimum Grade of C).

CJ 472 Comparative CJ Systems 3 cr
An examination of differences and similarities in criminal justice systems globally, including criminal law, crime rates, crime control and law enforcement.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or IS 100 Minimum Grade of C.

CJ 490 Special Topics- 3 TO 9 cr
Study of a significant topic, problem, or issue in criminal justice. May be repeated up to two times when the content varies. Only 6 credit hours may be applied to the criminal justice major.
Pre-requisite: CJ 105.

CJ 491 Seminar on Terrorism 3 cr
This course will examine the meaning, characteristics, typology, history, and causes of terrorism. The course will also summarize the biographies of prominent terrorists and conclude with a discussion of counter-terrorism strategies. Cross-listed with PSC 491 and IS 491.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C or PSC 130 Minimum Grade of C or IS 100 Minimum Grade of C.

CJ 492 Capstone Seminar CJ-W 3 cr
The Capstone course brings together key components form across the criminal justice curriculum. As part of the course, students will write a research paper, present their research, and take a comprehensive exam. CJ majors must earn a grade of C or better for graduation.
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C) and (PSC 130 Minimum Grade of D) and (CJ 220 Minimum Grade of D or CJ 320 Minimum Grade of D) and (CJ 240 Minimum Grade of D or CJ 340 Minimum Grade of D) and (CJ 310 Minimum Grade of D or PSC 310 Minimum Grade of D) and (CJ 330 Minimum Grade of D or PSC 330 Minimum Grade of D) and (CJ 360 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

CJ 494 Directed Studies - 1 TO 3 cr
Students will pursue directed research or readings on an approved topic in criminal justice.
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C).

CJ 496 Internship 3 cr
An opportunity to gain experiential learning through a supervised internship offered by a variety of criminal related agencies.
Pre-requisite: (CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C).

CJ 499 Honors Thesis W 3 TO 6 cr
The research and writing of a major paper in the field of criminal justice. Registration is open to criminal justice majors in the Honors College or those pursuing Department Honors.
Pre-requisite: CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

Cross Registration-SHC (CROS)

CROS 100 Spring Hill College Cross Reg 0 TO 6 cr
Course used to register students in Springhill Cross Registration Program

CROS 300 Spring Hill College Cross Reg 0 TO 6 cr
Course used to register students in Springhill Cross Registration Program
**Developmental Studies (DS)**

**DS 082 Introductory Algebra** 3 cr
This course combines topics in pre- and elementary algebra including operations with whole numbers, fractions, percents, exponents, signed numbers, order of operations; ratio and proportion; functions; graphs of linear equations; solving and graphing systems of linear equations and inequalities; operations with polynomials and factoring polynomials. Requires 100 extra minutes per week of lab time each week.

**Drama (DRA)**

**DRA 100 Theatre Wksp Rehrs-Perform** 1 cr
Practical experience in acting. May be repeated three times for a maximum of four credit hours. Prerequisite: Permission of department chair. Fulfills the Fine Arts and Humanities requirement in general education.

**DRA 101 Theatre Wksp Tech Production** 1 cr
Practical experience in backstage work. May be repeated three times for a maximum of four credit hours. Prerequisite: Permission of department chair. Fulfills the Fine Arts and Humanities requirement in general education.

**DRA 102 Theatre Wksp Special Act** 1 cr
Practical experience in theatre areas other than acting or technical production. May be repeated three times for a maximum of four credit hours. Prerequisite: Permission of department chair. Fulfills the Fine Arts and Humanities requirement in general education.

**DRA 103 Theatre Symposium** .5 cr
A symposium required for all full-time Theatre majors meeting weekly to share and discuss theatre activities. Four hours required for majors for graduation with adjustments made for transfer students. Prerequisites: Must be Theatre Major

**DRA 104 Fundamentals of Dance I** 3 cr
Beginning level instruction in dance, including theory and terminology, with a primary focus on classical ballet. Designed to prepare the student dancer for performance.

**DRA 105 Fundamentals of Dance II** 3 cr
Beginning-level instruction in Dance, with a primary focus on jazz and modern. Through the study of technique, theory, and terminology, students will be introduced to the form from the viewpoint of audience member, performer, and choreographer.

**DRA 110 Introduction to Theatre** 3 cr
A basic survey of theatre practice. Fulfills the Fine Arts and Humanities requirement in general education.

**DRA 111 Introduction to Dance** 3 cr
A basic survey of dance as an art form. Through readings, lectures, viewing of live and filmed dance, and basic studio work, students will gain a better appreciation of the historical development and forms of the art.

**DRA 115 Acting for Non-Majors** 3 cr
An interactive course designed to introduce the non-major to the art and discipline of acting as both performer and observer. Through a sequence of exercises and practice, the student will be introduced to the actor's mode of thinking, creating, and working. Fulfills the Fine Arts and Humanities requirement in General Education.

**DRA 116 Opera & Musical Theatre Wkshop** .5 cr
A performing ensemble dedicated to training students in the fundamentals of stage craft, performance, and production through experience with music for the stage. Standards of opera, operetta, and American musical theatre are explored in scene exercises and fully staged productions on and off campus. Enrollment is open to all students through audition or permission of the instructor. Course is cross-listed with MUO 116. Credit cannot be received for both MUO 116 and DRA 116. May be repeated four times for a maximum of two credit hours. Fulfills the Fine Arts and Humanities requirement in General Education.

**DRA 120 Acting I** 3 cr
A workshop-lecture course introducing a basic process for acting on the stage in the style of modern realism. Restriction: Must be a Drama major or minor or a dance minor. This course fulfills the Fine Arts and Humanities requirement in General Education.

**DRA 130 Stagecraft** 3 cr
A lecture-laboratory course in the fundamentals of stagecraft. This course fulfills the Fine Arts and Humanities requirement in General Education.

**DRA 131 Fundamentals of Stage Lighting** 3 cr
A lecture-laboratory course in the fundamentals of stage lighting. Prerequisite: This course fulfills the Fine Arts and Humanities requirement in General Education. Pre-requisite: DRA 133 Minimum Grade of C. DRA 133 can be taken concurrently with this course.

**DRA 132 Costume Fundamentals** 3 cr
A lecture-laboratory course in the fundamentals of costume making for the stage, including basic sewing skills as they apply to theatrical costumes. This course fulfills the Fine Arts and Humanities requirement in General Education.

**DRA 133 Computer Graphics Theatre** 1 cr
The fundamentals of computer drafting and graphic design for the stage.

**DRA 150 Text Analysis** 3 cr
Reading and analyzing play scripts as blueprints for dramatic actions, sights, sounds, characters, and productions. This course fulfills the Fine Arts and Humanities requirement in General Education.
DRA 204  Dance Techniques I   3 cr
A review and expansion of technique, vocabulary, and history of ballet, jazz, and theatrical dance.
Pre-requisite: DRA 104 Minimum Grade of D or DRA 105 Minimum Grade of D.

DRA 205  Dance Techniques II   3 cr
An exploration of modern dance techniques, vocabulary, and history with ballet as their basis.
Pre-requisite: DRA 204 Minimum Grade of D.

DRA 210  Makeup   1 cr
A study of the materials and techniques of theatrical makeup.

DRA 220  Stage Movement   3 cr
Through exercises and scene study, student-actors explore movement for the stage. This course fulfills the Fine Arts and Humanities requirement in General Education.
Pre-requisite: DRA 121 Minimum Grade of C.

DRA 221  Voice for Actors   3 cr
A workshop-lecture course in speaking voice and articulation for performance. This course fulfills the Fine Arts and Humanities requirement in General Education.
Pre-requisite: DRA 121 Minimum Grade of C.

DRA 230  Drawing & Drafting for Theatre   2 cr
Drawing and Drafting for the Theatre-An introductory course designed to develop basic skills in freehand drawing and mechanical drafting for theatre and the entertainment industry.

DRA 233  Rendering for the Theatre   1 cr
This course focuses on the major painting mediums, styles, of illustration, and techniques utilized in the visual presentations of costume, scene and lighting design for the theatre. The student will develop artistic skills and techniques through studio work in drawing and painting projects for the theatre. One (1) hour (second of three one (1) hour courses designed to develop Theatre Design & Technology students portfolio skills).

DRA 250  Theatre Management   3 cr
A basic course in the principles of accounting, purchasing, office management, house management, and promotion. This course fulfills the Fine Arts and Humanities requirement in General Education.

DRA 261  Creative Dramatics   3 cr
A practical course concerned with improvisational acting with children. Of special interest to students in Education and Leisure Services.

DRA 290  Special Topics -   1 TO 3 cr
Theatre and drama topics not covered in regular curriculum. May be repeated when subject varies for a total of 9 hours.

DRA 300  Adv Wksp Rehearsal and Perform   1 cr
Advanced practical experience in acting. May be repeated for a maximum of 4 hours. Prerequisites: Junior status and Permission of Instructor.

DRA 301  Adv Wksp Technical Production   1 cr
Advanced practical experience in backstage work. May be repeated for a total of 4 hours. Prerequisites: Junior status and permission of Instructor.

DRA 302  Adv Wksp Spec Activities   1 cr
Advanced practical experience in theatre areas other than acting or technical production. May be repeated three times for a total of four hours. Prerequisites: Junior status and permission of department chair.

DRA 310  Playwriting   3 cr
Studies in character, plot development, and the one-act play form. Prerequisite: Permission of Instructor.

DRA 315  History of Musical Theatre   3 cr
A comprehensive overview of the origins and evolution of American Music Theatre to present time. The course also includes both general and specific information toward appropriate performance choices. Cross-listed with MUL 315. Credit cannot be received for both DRA 315 and MUL 315.
Pre-requisite: EH 101 Minimum Grade of C and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

DRA 322  Adv. Voice and Movement   3 cr
An in-depth continuation of voice and movement training for the actor, with a focus on extending range and expressivity in the voice and body. Emphasis will be placed on understanding and transforming the actor's vocal and physical instrument. DRA 120, 220, and 221, or permission of department chair.
Pre-requisite: DRA 120 Minimum Grade of C and DRA 220 Minimum Grade of C and DRA 221 Minimum Grade of C.

DRA 323  Acting II   3 cr
Course is designed to teach theory and techniques in character development and analysis, as used in Realistic theatre, through the use of scene study. Prerequisites: DRA 120 Acting I, DRA 220 Stage Movement, DRA 221 Voice of the Actor, or permission of the dept. chair.
Pre-requisite: DRA 120 Minimum Grade of C or DRA 220 Minimum Grade of C or DRA 221 Minimum Grade of C.

DRA 330  Scene Design   3 cr
The fundamentals of scene design for the stage. Prerequisite: Limited to undergraduate status.
Pre-requisite: DRA 133 Minimum Grade of C.

DRA 331  Lighting Design   3 cr
The course focuses on the fundamentals of lighting design for the Stage.
Pre-requisite: DRA 131 Minimum Grade of C.

DRA 333  Design Portfolio   1 cr
An upper-level course meant to help graduating students focus on designing and developing an aesthetically pleasing portfolio for either graduate school interviews or professional theatre interviews. Development of a digital portfolio and a web page will also be included.
DRA 334 Costume Design  3 cr
A class in basic design theory, concentrating on design concept, characterization and research. Some instruction in figure drawing and rendering. Artistic and Technical concerns as they apply to Costume Design will be addressed through lectures, discussions, and critiques. The course will focus on the first half of the design process: research, direction and rendering of ideas. Special concentration will focus on character analysis and their physical manifestations. In-class critiques will help the student to identify and utilize the characteristics of good design.

DRA 340 Directing I  3 cr
The fundamental techniques involved in directing a stage play: analysis, casting, and blocking.
Pre-requisite: DRA 120 Minimum Grade of C and DRA 150 Minimum Grade of C.

DRA 350 Theatre History I - W  3 cr
A comprehensive study of the important developments in theatre art from its beginnings to 1642, including a computer component.
Pre-requisite: DRA 120 Minimum Grade of C and DRA 150 Minimum Grade of C and EH 102 Minimum Grade of C.

DRA 351 Theatre History II - W  3 cr
A continuation of DRA 350 from the Restoration to the present.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

DRA 352 Period Styles For The Theatre  3 cr
Historical study of dress in relation to costuming for the Stage. For Tech-Design students and Actors.

DRA 410 3-Dimensional Makeup and Masks  3 cr
A class in basic face casting, theatrical masks and slush mold latex appliances for the Stage.
Pre-requisite: DRA 210 Minimum Grade of C.

DRA 416 Opera & Musical Theatre Wkshop  .5 cr
A performing ensemble dedicated to training students in the fundamentals of stage craft, performance, and production through experience with music for the stage. Standards of opera, operetta, and American musical theatre are explored in scene exercises and fully-staged productions on and off campus. Enrollment is open to all students through audition or permission of the instructor. Course is cross-listed with MUO 416. Credit cannot be received for both MUO 416 and DRA 416. May be repeated four times for a maximum of two credit hours. Fulfills the Fine Arts and Humanities requirement in General Education.

DRA 420 Studies in Acting Styles  3 cr
Variable content course featuring acting styles found in different theatrical genres as well as for the camera. May be repeated twice for credit when topic varies.
Pre-requisite: DRA 120 Minimum Grade of C and DRA 220 Minimum Grade of C and DRA 221 Minimum Grade of C.

DRA 433 Studies in Advanced Design -  3 cr
Advanced studies in either Scene Design, Costume Design, or Lighting Design for the Stage. May be repeated once if the topic varies for a total of six credits.
Pre-requisite: DRA 330 Minimum Grade of C or DRA 431 Minimum Grade of C or DRA 432 Minimum Grade of C.

DRA 435 Design Practicum - Main Stage  3 cr
A class geared to giving the student practical application design theory, continued development of render/modeling skill, and actualization of design
Pre-requisite: DRA 330 Minimum Grade of C or DRA 331 Minimum Grade of C or DRA 332 Minimum Grade of C.

DRA 460 Theatre for Youth  3 cr
The reading and production techniques of plays for children and teenagers.

DRA 480 Senior Capstone  3 cr
"A culminating experience for all theatre majors, this course will provide instruction in professional theatre business practices aimed at graduating students about to leave the university for early career opportunities, as well as afford the student the opportunity to prepare and present a major research project that builds upon and synthesizes the knowledge and skills acquired during their theatre studies. A presentation of the research project will be presented to the entire department, and adjudicated by the full-time theatre faculty."
Pre-requisite: DRA 340 Minimum Grade of C.

DRA 490 Special Topics  1 TO 3 cr
Various topics of special interest to Theatre majors. Restrictions. Limited to undergraduate status. Prerequisite: Permission of department chair. May be repeated once for a maximum of six credit hours when topic varies.

DRA 494 Directed Studies -  1 TO 3 cr
Independent study under faculty supervision, involving research readings, or artistic projects. Restrictions: Limited to undergraduate status. Prerequisites: Permission of department chair. May be repeated seven times for a maximum of eight credit hours.

DRA 496 Theatre Internship  6 cr
Practical experience in stock, repertory, or touring theatre.

Earth Sciences (ES)

ES 301 Writing for the Earth Sci -W  3 cr
This course is designed to introduce students to basic scientific writing skills. Participants will review the general principles of clear writing and will apply these principles to writing for a specific audience. Particular emphasis will be placed on conveying the significance of research, outlining the aims, and discussing the results for scientific papers.
Pre-requisite: EH 101 Minimum Grade of C or EH 102 Minimum Grade of C.
ES 492 Honors Earth Sciences Sem - H 3 TO 4 cr
Multidisciplinary (Geography, Geology, Meteorology) topics not covered in current Department of Earth Sciences courses. Topic announced prior to registration. Prerequisites: acceptance into the University Honors Program, the Earth Sciences Departmental Honors Program, or by permission of the Chair of Earth Sciences. (Completion of this course is required for the Earth Sciences Departmental Honors students)

ES 497 Senior Thesis Prospectus - H 2 cr
With the guidance and advice of a Senior Thesis Committee, students will identify a suitable research project in Earth Sciences (Geography, Geology, Meteorology) and develop a thesis prospectus to conduct this research during their senior year. The Senior Thesis prospectus will be evaluated by the committee which must pass it before thesis research can formally begin. Prerequisites: establishment of a senior thesis committee; acceptance into the Departmental Honors Program.

ES 499 Senior Honors Thesis - H - W 3 cr
With the guidance and advice of a Senior Thesis Committee, students will carry out an in-depth research project in Earth Sciences (Geography, Geology, Meteorology) according to an accepted Thesis Prospectus during their senior year. This course will be repeated for up to six (6) credits. Prerequisites: Geography, Geology, Meteorology major, senior status; acceptance into the Departmental or University Honors Program. Pre-requisite: ES 497 Minimum Grade of C or HON 301 Minimum Grade of C and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

Economics (ECO)

ECO 215 Prin of Microeconomics 3 cr
Functions of the price system in a market economy; role of households and business firms in mobilizing resources to meet human needs. The functional and personal distribution and use of income. Relevant problems are discussed.

ECO 216 Prin of Macroeconomics 3 cr
Economics as a science; its nature and functions. Analysis of the American economy from the macroeconomic viewpoint, stressing full employment, monetary and fiscal policy, national income accounting, and their application to current problems and issues.

ECO 300 Introduction to Economics 3 cr
Intensive study of micro-and macroeconomic principles with emphasis on application to current economic issues and problems of interest to public school teachers and students.

ECO 315 Intermediate Microeconomics 3 cr
Operation of the price system, with special reference to a market economy and to related public policies and business issues; analysis of the distribution of income; theories of consumer behavior, the firm, resource allocation, and product distribution. Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 316 Intermediate Macroeconomics 3 cr
The nature and control of forces in a developed economy which determine levels of employment, income and use of resources, and rate and direction of economic growth. Pre-requisite: ECO 214 Minimum Grade of D or ECO 216 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 318 Prin of Managerial Economics 3 cr
Study of economic principles and methods in analyzing problems faced by management of a business or other type of organization; application of economic concepts to finding solutions of such problems that advance the best interest of such organizations. Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 322 Economics of Industrial Org 3 cr
An analysis of the effect of modern industrial structure on competitive behavior and performance, in the light of contemporary price theory and the theory of workable competition; a critical evaluation of the legislative content, judicial interpretation, and economic effects of antitrust laws, current problems and proposed remedies. Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 323 Public Finance 3 cr
The nature, purposes, and economic effects of various types of taxes in a federal government. Problems of tax administration, budgeting, and expenditure of tax revenues. Review of current problems. Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 330 Current Global Economic Issues 3 cr
Application of the standard economic theory to markets to analyze major issues confronting U.S. consumers and businesses in the global economy. Topics include comparative advantage, commercial policy and protectionism, currency markets and foreign exchange rates, economic integration and free trade areas, international trade accounting, and financial aspects of international trade. Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 340 Money and Banking 3 cr
Analysis of monetary, credit, and banking institutions in the American economy, emphasizing commercial banks, the Federal Reserve System, and the Treasury. Credit for both ECO 340 and FIN 343 is not allowed. Pre-requisite: FIN 315 Minimum Grade of D.
ECO 343  Labor Economics  3 cr
United States population analyzed by age, sex, and other characteristics; study of the labor force and its composition; unemployment and underemployment. Education as an investment in productive resources. Economics of leisure, health, housing, recreation, and other areas of human-resource development.
Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 355  Sport & Entertainment Econ  3 cr
The analysis of the economics of decision making and trends in sports and entertainment media. This class will cover cases where economic analysis has caused in behavior, as well as cases where various groups appear to behaving irrationally. Prerequisites: ECO 215 or ECO 300 for non-business and non-economic major.
Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 363  International Economics  3 cr
Modern international trade theory; the balance of payments and the adjustments processes; the evolution of international economic institutions; critical analysis of current international economic policies - trade, monetary, and regional economics organizations.
Pre-requisite: ECO 214 Minimum Grade of D or (ECO 212 Minimum Grade of D or ECO 215 Minimum Grade of D) or ECO 216 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 371  Economic Development  3 cr
Economic development theory with stress on the roles of technology, management, international financing, technical assistance organizations, and international private investment. Factors that control and influence the developmental and growth process either positively or negatively. Prerequisites: ECO 215 or ECO 300 for non-business and non-economics majors.
Pre-requisite: ECO 215 Minimum Grade of C or ECO 300 Minimum Grade of C.

ECO 372  Economics of Urban Development  3 cr
This course addresses contemporary issues of urban and metropolitan areas. The course focuses on understanding the main economic forces leading to the existence of cities and regional agglomeration. Students will also use neoclassical economic theory to critically analyze economic efficiency and the spatial structure of markets. The course includes a wide range of topics such as urban growth, business clusters, poverty, crime, urban transportation, positive and negative externalities in urban areas, land use theory, housing, and the role of local governments.
Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 383  Economic History of the US  3 cr
The evolution of the modern United States economic system. The parts played by exploitation of natural resources, investment from abroad, financial institutions, and technology in arriving at the present economic situation. Critical analysis of development just before, during, and after World War II, and of current economic problems.
Pre-requisite: (ECO 215 Minimum Grade of D or ECO 212 Minimum Grade of D) and (ECO 214 Minimum Grade of D or ECO 211 Minimum Grade of D or ECO 216 Minimum Grade of D) or ECO 300 Minimum Grade of D.

ECO 390  Environmental Economics  3 cr
This course introduces students to the economic and environmental implications of natural resource management. The course covers conceptual and methodological topics, including sustainability, which will be applied to contemporary issues i.e. depletion of renewable resources, land and water scarcity, and climate change. Specific topics include the economics of energy, fisheries, forestry, food and pollution.
Pre-requisite: ECO 215 Minimum Grade of D or ECO 300 Minimum Grade of D.

ECO 451  Mathematical Economics  3 cr
Application of business and economics concepts using economic models and equilibrium, matrix algebra, differentiation, comparative static analysis, optimization problems, and other selected techniques.
Pre-requisite: MA 120 Minimum Grade of D and ECO 215 Minimum Grade of D or ECO 216 Minimum Grade of D or ECO 300 Minimum Grade of D. MA 120 can be taken concurrently with this course.

ECO 453  Intro to Econometrics  3 cr
Study of regression analysis and its application to business, economics, and other social-science problems; emphasis on model building, research writing, and econometric forecasting. Students are required to write a term paper on econometric applications under direct supervision of the instructor.
Pre-requisite: (BUS 245 Minimum Grade of D or ST 210 Minimum Grade of D) and (ECO 215 Minimum Grade of D or ECO 216 Minimum Grade of D or ECO 300 Minimum Grade of D). MA 120 can be taken concurrently with this course.

ECO 490  Special Topics  3 cr
Designed to provide senior students an opportunity to study selected topics of particular interest. A student may count no more than six hours of Special Topics in the concentration.
Pre-requisite: Approval of Department Chair.

ECO 491  History of Economic Thought -W  3 cr
Economic ideas from the Greeks to present with intensive study of the classical, neoclassical, and contemporary schools of economic thought.
Pre-requisite: (ECO 215 Minimum Grade of D or ECO 212 Minimum Grade of D) or ECO 300 Minimum Grade of D.
**ECO 494**  Dir St in Economics  3 cr
Reading and research on selected economic topics under guidance of the departmental faculty. Junior and senior standing, a cumulative GPA of 2.5 or better, and approval of the department chair following the evaluation of a written proposal.

**ECO 496**  Economics Internship  3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed projects under the supervision of Department Chair. No more than three hours of internship credit may be counted toward a degree in the Mitchell College of Business. Prerequisites: Junior or Senior standing, declared major in finance, overall GPA of at least 2.5, and Internship Agreement signed by department Chair.

**ECO 498**  Economics Internship II  3 cr
The internship experience is designed to give students practical experience in their field of study. Students complete directed learning experiences under the supervision of the Department Chair. Prerequisites: Junior or Senior Standing, declared major in economics, overall GPA of at least 2.5 and internship agreement signed by the Department Chair.

**ECO 506**  Economic Theory  3 cr
An introduction to economic theory, including the basic theory of the market (supply and demand); elasticity; introduction to market structure; trade theory; international trade and balance of payments; national income accounting; money and the banking system; macroeconomic theories, and macroleconomic stabilization policy.

**ECO 590**  Sp Top -  3 cr
Designed to provide graduate students an opportunity to study selected topics. (A student may count no more than three hours of Special Topics in the MBA degree program.) Prerequisite: Approval of Department Chair.

**ECO 594**  Independent Study in Economics  3 cr
Readings and research on selected topics. Conferences and formal research report required. Approval of Department Chair.

**EDU 290**  Special Topics  1 TO 3 cr
Guided study of selected educational tasks (e.g. curriculum revision, classroom materials development, models of learning and teaching) and teaching problems and practices for improving student achievement. Not more than six hours may be earned in Special Topics courses.

**EDU 300**  Classroom Management  1 cr
An introductory course in classroom management with emphasis upon effective instructional practices that inhibit student behaviors incompatible with learning. The focus is upon PEPE and how it provides the framework for effective teaching practices through the use of rules and procedures. Co-requisite: EDU 312, EDU 313, EDU 331, EDU 336
Pre-requisite: EDU 330 Minimum Grade of C.

**EDU 301**  Arts in the Elementary School  3 cr
Knowledge and skills appropriate to the elementary school art program. Techniques in media for teaching art in the various grades.

**EDU 302**  Classroom Management  2 cr
An introductory course in classroom management with emphasis upon effective instructional practices that inhibit student behaviors incompatible with learning. The focus is upon PEPE and how it provides the framework for effective teaching practices through the use of rules and procedures. Co-requisite: EDU 311, EDU 335, EDU 337, EDU 345, EDU 362
Pre-requisite: EDU 300 Minimum Grade of C and EDU 303 Minimum Grade of C and EDU 313 Minimum Grade of C and EDU 336 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C.

**EDU 303**  Field Experience SPE  1 TO 3 cr
An in-field opportunity for early field-based practicum in a variety of placements. Pre-requisite: EDU 330 Minimum Grade of C.

**EDU 311**  Partnerships in SPE  3 cr
Emphasis is on the special problems found in the home, community, and school of the exceptional child, the teacher, the family, and community resource agencies. Ways for the teacher to form teams with work collaboratively with all human resources involved in the child's life are explored and ethical and moral standards examined. Co-requisite: EDU 302, EDU 335, EDU 337, EDU 345, EDU 362
Pre-requisite: EDU 300 Minimum Grade of C and EDU 303 Minimum Grade of C and EDU 313 Minimum Grade of C and EDU 336 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 312 Minimum Grade of C.

**EDU 312**  Intell and Physical Disabilit  3 cr
A study of the intellectual and physical disability which usually require substantial curriculum adaptations or ecological accommodation. Historical perspectives, etiology, definitions, classification, treatment, social aspects and interdisciplinary team work will be explored. Co-requisite: EDU 300, EDU 313, EDU 331, EDU 336
Pre-requisite: EDU 330 Minimum Grade of C.

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**Education-K-6 And 6-12 Teacher (EDU)**

**EDU 430L**  K-6 Internship Lab  3 TO 9 cr
Observation and supervised teaching in elementary or early childhood settings with the opportunity for study and discussion of problems and issues encountered.

**EDU 100**  Role of the Teacher  2 cr
This course provides a broad overview of education, schools, and teaching as well as an orientation to the K-6 Teacher Education Program.
EDU 313  Learning & Behav Disorders  3 cr
An examination of the definitions, characteristics, and prevalence of children with learning and/or behavioral disabilities. Emphasis is placed on the causes of problems in motor, perceptual, social, academic, affective and behavioral development. Students will be introduced to current service delivery models and the programming options for individuals with learning and behavioral disabilities.
Co-requisite: EDU 300, EDU 312, EDU 331, EDU 336
Pre-requisite: EDU 330 Minimum Grade of C.

EDU 321  Field Experience in SpeEd Sett  1 cr
A series of in-field opportunities in Special Education. A variety of appropriate placements will be employed depending on each student's interest and needs. May be repeated for credit.
Co-requisite: EDU 400

EDU 322  Field Experience in SpeEd Sett  1 cr
A series of in-field opportunities in Special Education. A variety of appropriate placements will be employed depending on each student's interest and needs. Students are placed in settings related to the student's major areas of study and co-requisites in progress. May be repeated for credit.
Co-requisite: EDU 354

EDU 330  Foundations Read Instruct - W  3 cr
A course to orient the study to fundamentals in the teaching of reading and provides practice in basic skills. This course has a required field experience.

EDU 331  Teaching Reading  3 cr
A course focusing on methodology, materials, and techniques for developing systematic instruction and diagnosis appropriate for early childhood and elementary children. This course has a required field experience.
Co-requisite: EDU 300, EDU 312, EDU 313, EDU 336
Pre-requisite: EDU 330 Minimum Grade of C.

EDU 332  Teaching Language Arts  3 cr
A course presenting methods of promoting meaningful language and literacy skills in early childhood and elementary school programs. This course has a required field experience.

EDU 335  Teaching Mathematics - W  3 cr
A course which deals with effective methods of teaching mathematics to elementary school students. Emphasis will be on developing an understanding of numbers, teaching basic operations, and using teaching aids and materials to meet the various needs of elementary age children. This course has a required field experience.
Co-requisite: EDU 302, EDU 311, EDU 337, EDU 345, EDU 362
Pre-requisite: EDU 300 Minimum Grade of C and EDU 303 Minimum Grade of C and EDU 313 Minimum Grade of C and EDU 336 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 346 Minimum Grade of C.

EDU 336  Teaching Social Studies  3 cr
A course using problem solving and independent investigation as means as teaching the relationship of humans to their environment. Objectives, content and procedures are discussed. This course has a required field experience.
Co-requisite: EDU 300, EDU 312, EDU 313, EDU 331
Pre-requisite: EDU 330 Minimum Grade of C.

EDU 337  Teaching Science  3 cr
A course using discovery, inquiry and problem-solving approaches as a means of teaching science. Relationships of science to entire early childhood and elementary curriculum is discussed. This course has a required field experience.
Co-requisite: EDU 302, EDU 311, EDU 335, EDU 345, EDU 362
Pre-requisite: EDU 300 Minimum Grade of C and EDU 303 Minimum Grade of C and EDU 313 Minimum Grade of C and EDU 336 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C.

EDU 340  Fundamentals of Teaching - W  3 cr
This course provides an introduction to effective instructional practices in the secondary classroom. The focus is on planning for and delivering instruction which promotes successful classroom management. This course has a required field experience.
Pre-requisite: EDM 310 Minimum Grade of C and EDU 400 Minimum Grade of C and EPY 351 Minimum Grade of C.

EDU 341  Middle Level Education - W  3 cr
Philosophy, concepts, and issues of middle level education including the developmental stage of young adolescence, appropriate and responsive curricular, and meeting the physical, emotional, psychosocial, and cognitive needs of diverse learners.
Co-requisite: EDU 342, EDU 363, EDU 451
Pre-requisite: EDU 340 Minimum Grade of C and EDU 453 Minimum Grade of C or EDU 454 Minimum Grade of C or EDU 456 Minimum Grade of C or EDU 457 Minimum Grade of C. EDU 453 and EDU 454 and EDU 456 and EDU 457 can be taken concurrently with this course.

EDU 342  Secondary Field Experience  1 TO 3 cr
Supervised practice in teaching curriculum areas in middle and high school classroom settings during the semester in which block courses are taken.
Co-requisite: EDU 341, EDU 363, EDU 451
Pre-requisite: EDU 340 Minimum Grade of C and EDU 453 Minimum Grade of C or EDU 454 Minimum Grade of C or EDU 456 Minimum Grade of C or EDU 457 Minimum Grade of C. EDU 453 and EDU 454 and EDU 456 and EDU 457 can be taken concurrently with this course.
EDU 345 Field Experience  1 TO 3 cr
Supervised practice in teaching curriculum areas in the elementary or early childhood classroom setting during the semester in which sequence courses are taken.
Co-requisite: EDU 302, EDU 311, EDU 335, EDU 337, EDU 362
Pre-requisite: EDU 300 Minimum Grade of C and EDU 303 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 313 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 336 Minimum Grade of C.

EDU 346 K-6 Education  3 cr
This course will introduce the roles of the teacher in working with children in the elementary grades.

EDU 348 P-3 Education  3 cr
This course will introduce the roles of the teacher in working with children during the early childhood years (preschool through 3rd grade).

EDU 352 Literature for Adolescents  3 cr
This course will introduce the roles of the teacher in working with children from pre-kindergarten through the primary grades. History, management, and parent education techniques are presented.

EDU 354 Serving Students Severe Disabilities  3 cr
Curriculum and methods for individuals who exhibit significant challenges in the areas of cognitive, motor, self care, communicative, and/or social behaviors. Emphasis is on physical management, class/individual scheduling, adapted aids and equipment, task analysis, and functional life skills.

EDU 362 Behavior Management of Exceptional Children  3 cr
Presentation of the principles and applications of behavioral modification, data collection procedures, and single-subject research designs as related to exceptional children and youth in special education environments.
Co-requisite: EDU 302, EDU 311, EDU 335, EDU 337, EDU 345
Pre-requisite: EDU 300 Minimum Grade of C and EDU 303 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 336 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C.

EDU 363 Teaching Adaptive Curriculum Through Classrooms  3 cr
An examination of regular and special education K-12 curricula, materials, and procedures. Specific emphasis will be placed on the selection modification, and adaptation of curricula, materials, and procedures to meet the needs of individuals with learning and behavioral disabilities.
Pre-requisite: EDU 340 Minimum Grade of C.

EDU 372 Behavior Management of Exceptional Children  3 cr
Presentation of the principles and applications of behavioral analysis, data collection procedures, and single subject research designs as related to exceptional children and youth.

EDU 373 Teaching Reading to Students with Disabilities  3 cr
Introduces the student to the curriculum, teaching the methodologies and instructional activities and materials associated with effective and appropriate developmental and functional reading instruction for students with disabilities.

EDU 398 P-3 Field Experience  3 cr
Observation and supervised teaching in an early childhood classroom setting prior to Internship
Pre-requisite: EDU 348 Minimum Grade of C.

EDU 400 Edu Exceptional Child and Youth  3 cr
Introduction to the field of exceptional children and youth, involving the study of various areas of exceptionality.

EDU 410 Formal and Informal Assessment  3 cr
Assesses developmental levels, academic and non-academic performance of exceptional individuals through the administration and interpretation of criterion-referenced instruments, and informal measures. Evaluation of classroom teaching and special education programs is also emphasized.

EDU 429 Opening School Lab Experience  0 TO 1 cr
Professional laboratory experiences of observation and participation for a two-week period at the opening of school. (May be taken twice.) Prerequisite: senior standing.

EDU 430 K-6 Internship  3 TO 9 cr
Observation and supervised teaching in elementary or early childhood settings with the opportunity for study and discussion of problems and issues encountered.
Co-requisite: EDU 495
Pre-requisite: EDU 300 Minimum Grade of C and EDU 302 Minimum Grade of C and EDU 311 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 335 Minimum Grade of C and EDU 337 Minimum Grade of C and EDU 345 Minimum Grade of C and (PRAXIS-Teaching Reading CB 157 or PRAXIS-Teaching Reading 159) and (PRAXIS-Read/Lang Arts Subtest 157 and PRAXIS-Mathematics Subtest 157 and PRAXIS-Social Studies Subtest 154 and PRAXIS-Science Subtest 158).

EDU 432 Impact Type & Atypical Development on Education  3 cr
An examination of typical child development and developmental characteristics of infants, toddlers, and young children with disabilities from the prenatal period through age eight. Characteristics of disabling conditions and their impact upon development are also discussed.

EDU 433 Issues in Elementary Education  3 cr
This course prepares students to work with infants, toddlers, and young children with disabilities and their families. Topics covered include specific teaching and intervention techniques, special education laws and regulations, and service delivery models.
EDU 451  Content Area Literacy  3 cr
Methods and materials in the teaching of reading. Development of effective study and skills at the secondary level is stressed.

EDU 453  Teaching Language Subjects  3 cr
Assists the student in organizing materials and in developing methods of teaching language subjects in secondary schools
Co-requisite: EDU 341, EDU 342
Pre-requisite: EDU 340 Minimum Grade of C.

EDU 454  Teaching Mathematics  3 cr
Assists the student in organizing materials and in developing methods of teaching mathematics in secondary schools.
Co-requisite: EDU 341, EDU 342
Pre-requisite: EDU 340 Minimum Grade of C.

EDU 456  Teaching Science  3 cr
Assists the student in organizing materials and in developing methods of teaching science in secondary schools
Co-requisite: EDU 341, EDU 342
Pre-requisite: EDU 340 Minimum Grade of C.

EDU 457  Teaching Social Studies  3 cr
Assists the student in organizing materials and in developing methods of teaching social studies in secondary schools
Co-requisite: EDU 341, EDU 342
Pre-requisite: EDU 340 Minimum Grade of C.

EDU 465  Student Teaching Secondary Sch  3 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field.
Prerequisite: Appropriate methods course.
Pre-requisite: EDU 341 Minimum Grade of C.

EDU 466  Internship-Language Arts  3 TO 9 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the 6-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field.
Pre-requisite: (EDU 341 Minimum Grade of C and EDU 453 Minimum Grade of B and PRAXIS-Eng Lang Arts-Cont Know 167 ).

EDU 467  Internship - Social Studies  3 TO 9 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field.
Pre-requisite: EDU 341 Minimum Grade of C and EDU 457 Minimum Grade of B and PRAXIS-Soc St Cont Knowledge 155 or PRAXIS-Soc Stud Cont Knowledge 155 .

EDU 468  Internship - Science  3 TO 9 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the 6-12 program. Students will be placed with a person holding a Masters degree and a valid teaching certificate in the appropriate field.
Pre-requisite: EDU 341 Minimum Grade of C and EDU 456 Minimum Grade of B and (PRAXIS-Gen Sci Cont Knowledge 152 or PRAXIS-Gen Science Cont Knowl 152 or PRAXIS-Chem Cont Knowledge 150 or PRAXIS-Chem-Cont Knowledge 150 or PRAXIS-Physics Cont Knowledge 138 or PRAXIS-Biology Cont Knowledge 150 ).

EDU 469  Internship - Math  3 TO 9 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the 6-12 program. Students will be placed with a person holding a Masters degree and a valid teaching certificate in the appropriate field.
Pre-requisite: (EDU 341 Minimum Grade of C and EDU 454 Minimum Grade of B and PRAXIS-Math Cont Knowledge 150 ).

EDU 490  Special Topics  3 cr
Guided study of selected educational tasks (e.g. curriculum revision, classroom materials development, models of learning and teaching) and teaching problems and practices for improving student achievement. Not more than six hours may be earned in Special Topics courses.

EDU 494  Directed Research Studies  1 TO 3 cr
No more than six hours can be accepted for a Bachelor's Degree and Class B Certificate.

EDU 495  K-6 Internship SPE  3 TO 9 cr
Observation and supervised K-6 classroom teaching experience providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.
Co-requisite: EDU 430
Pre-requisite: EDU 300 Minimum Grade of C and EDU 302 Minimum Grade of C and EDU 311 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 335 Minimum Grade of C and EDU 337 Minimum Grade of C and EDU 345 Minimum Grade of C and (PRAXIS-Teaching Reading CB 159 or PRAXIS-Teaching Reading 159 ) and (PRAXIS-Read/Lang Arts Subtest 157 and PRAXIS-Mathematics Subtest 157 and PRAXIS-Social Studies Subtest 154 and PRAXIS-Science Subtest 158 ).

EDU 496  Internship 6-12  9 cr
Observation and supervised classroom teaching experience providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.
Pre-requisite: EDU 372 Minimum Grade of C and EDU 363 Minimum Grade of C.
EDU 497  P-3 Internship  3 TO 9 cr
Observation and supervised classroom teaching experience providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.
Pre-requisite: EDU 302 Minimum Grade of C and EDU 311 Minimum Grade of C and EDU 312 Minimum Grade of C and EDU 331 Minimum Grade of C and EDU 335 Minimum Grade of C and EDU 337 Minimum Grade of C and EDU 345 Minimum Grade of C and EDU 430 Minimum Grade of C and EDU 495 Minimum Grade of C and PRAXIS-Early Child Edu 156.

EDU 498  P-3 Internship  1 TO 3 cr
Observation and supervised teaching experience providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.
Pre-requisite: EDU 348 Minimum Grade of C and EDU 398 Minimum Grade of C.

EDU 499  Senior Honors Project - H  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of elementary/early childhood study, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to six hours. Prerequisite: Participant in honors program and junior level status.

EDU 500  Capstone Portfolio  0 cr
The capstone portfolio is a 0 credit course for graduate students whose programs require a capstone portfolio as all or part of their comprehensive exam. Students will enroll in this course for their final semester. The portfolio will be developed under the guidance of the student's academic advisor and other departmental faculty, and will demonstrate mastery of content knowledge, professional dispositions and skills.

EDU 567  Multicultural Exp in Schools  3 cr
In an increasingly diverse society, teachers must be able to work with students with form a variety of backgrounds, some quite different from teachers’ own cultural backgrounds. This course responds to the growing need for better training for teachers in how to work with a diverse population, increase academic achievement, and prepare students from a global workplace.

EDU 640  Instructional Development  3 cr
Preparation of a modular program of instruction which incorporates all elements of the instructional-design process.

EDU 650  Instructional Techniques  3 cr

EDU 692  Research Proj Seminar  3 cr
Survey of both current and classic research in education. Students will identify a research problem of significance in their area of specialization and develop a strategy or research design to solve this problem.
Pre-requisite: IDE 510 Minimum Grade of B.

Educational Foundations (EDF)

EDF 207  Law and Politics in Educ  3 cr
Examines the legal and political considerations that affect education in America. Emphasis will be placed on the practical applications of these legal and political considerations to the operation of schools.

EDF 211  Clinical and Lab Experience  0 cr
Provides relevant clinical and laboratory experiences directly related to the several academic disciplines that constitute the social foundations of education. Must be taken with EDF 315. Requires a special fee.
Co-requisite: EDF 315

EDF 290  Sp Top -  1 TO 3 cr
Varies in content in one disciplinary area of educational foundations (e.g., history of education or anthropology of education) or in an interdisciplinary area (e.g., multicultural education). May be repeated for credit when course content varies.

EDF 300  Gender & International Devel-W  3 cr
This course introduces concepts in gender, international development and global education through an examination and critique gender issues in developing nations and international efforts to address these concerns from the 1970’s to the present with particular emphasis on the context of women. Includes formal and nonformal education of women, cultural differences (reproduction, marriage, male/female hierarchies) affecting life opportunities, rural vs. urban issues, politics, social class influences, international movements, and organizations and efforts to empower girls and women to advance their lives within the context of gendered social roles. Analysis of issues through various lenses including the Gender Equality Continuum. Students will interact directly with individuals in the field via videoconferencing and other modes of electronic communication. Assessment will center on a guided project and experience specific to individual student interests.
Pre-requisite: EH 102 Minimum Grade of C.
EDF 310  International Develop & Educ-W  3 cr
A study of international development and education in global and gender contexts that includes an examination of policy, structure, sociological issues (gender, religion, social class), and formal, adult and nonformal education. Major agency providers in the field and employment opportunities in the public and private sectors will be reviewed. Students will interact with individuals in the field through videoconferencing, face-to-face dialogues and other electronic interactions. Assessment will center on a guided project and experience specific to individual student interests. This course helps prepare students for a summer study abroad service learning experience in a developing country.
Pre-requisite: EH 102 Minimum Grade of C.

EDF 315  Education in Diverse Society  3 cr
Focused on the effects of diversity on teaching and learning this course is a study of the social context of schooling from historical, philosophical, sociological, political, and comparative perspectives.

EDF 320  Compar & Intl. Gender & Fam  3 cr
The content will focus on comparative and international gender and family issues regarding non-formal adult health education and services. The student will do readings in this content area and compare human rights related to gender and family roles, woman's health issues and family planning services across the nations, how these relate to life opportunities for women and men. Programs providing related services and education will be analyzed. Students will dialogue with individual working in the field to gain a deeper understanding of contemporary real-world endeavors. Assessment will center on a guided project and experience specific to individual student interests and includes a service learning component at a local agency or an agency serving a developing country.

EDF 325  Global Gender Perpec in Ed  3 cr
An examination of gender and race, class, religion, language and ethnicity in formal and nonformal education in US and global contexts that develops cultural competencies and prepares students with an interest in international development/education careers. Students will interact directly with professionals in the field from various cultural backgrounds via videoconferencing and other modes of electronic communication. Assessment will center on weekly applications of course topics to real world situations and guided project or service learning specific to individual student interests.

EDF 330  Amer Ed Comp Global Framework  3 cr
An overview of education in its three aspects: formal, nonformal and informal. It will include the history, philosophy, sociology, policy and structure of the American education in comparison with other countries' systems. A regional approach will include northern Africa, the Indian Subcontinent, Asia, pacific Islands and Australia, Central America and the Caribbean, South America, Canada and Europe. Assessment will center on weekly applications of course topics to real world situations and a guided project or service learning experience specific to individual student interests.

EDF 335  Intern. Devel & Global Ed  3 cr
A study of current problems and issues in non-formal, informal and all levels of formal education. Includes poverty, inequality and human rights and related structures, policies and programs. Includes poverty, inequality and human rights and related structures, policies and programs. Major issue areas include health, gender, rural development, agriculture, civil society, economics, sustainability, politics and reform. Content may vary according to currently important issues. Assessment will center on weekly applications of course topics to real world situations and a guided project or service learning experience specific to individual student interests.

EDF 490  Special Topics  1 TO 3 cr
Varies in content in one disciplinary area of educational foundations (e.g., history of education or anthropology of education) or in an interdisciplinary area (e.g., multicultural education). May be repeated for credit when course content varies.

EDF 494  Directed Studies  1 TO 3 cr
Directed study. Prerequisite: Permission of Department. (No more than two directed studies can be counted toward the Bachelor's Degree and Class B Certificate.)

EDF 501  Cult Found of Education  3 cr
A presentation and investigation of basic concepts, issues, and principles of American education within a social scientific framework; particular emphasis is on multicultural concerns and strategies.

EDF 515  Multicultural Education  3 cr
In a multicultural society, teachers must be able to work with students from a variety of backgrounds—some quite differently from the teachers' own. Four cultural factors are the focus of this course: social class, race, gender, and ethnicity. Teachers sensitive to these factors can prepare students to survive and function in the dominant culture without sacrificing pride in the students' own cultures.

EDF 590  Sp Top -  1 TO 3 cr
Course may vary in content or may be supervised study in one disciplinary area of educational foundations (e.g., history of education or anthropology of education) or in an interdisciplinary area (e.g., multicultural education). May be repeated for credit when course content varies.
EDF 594  Dir St and Research  1 TO 3 cr
Students explore problems and issues of special interest or significance in educational foundations. Not more than three semester hours of any departmental 594 courses can be accepted toward a degree program.

EDF 610  History of American Educ  3 cr
Designed to give the student an historical perspective on important issues in American education. Among these issues are the influence of class, race, gender, ethnicity, and exceptionality on educational attainment; the control of public education; the debate over public schools versus private schools; the status and work of teachers; and the role of education in social change. The student will relate the past to the present in analyzing these issues.

EDF 615  Sem in Ed Policy Studies  3 cr
This course offers advanced graduate students the opportunity to examine educational policy and policy-making from sociocultural, political, historical, philosophical, and comparative and international perspectives. After analyzing a common core of issues, students will investigate a topic of their choice using research skills from the educational foundations disciplines.

EDF 620  Compar-Internat Educ  3 cr
Comparative and International Education will examine different world cultures and nations and their educational systems. The course will explore the various outcomes of education (achievement, status, employment, living conditions) and will examine the world crisis in education. In all, a study of education from a world-wide perspective will help illuminate the educational purposes, programs, and achievements of schools in the United States.

EDF 690  Sp Top -  1 TO 3 cr
Course may vary in content or may be supervised study in one disciplinary area of educational foundations (e.g., history of education or anthropology of education) or in an interdisciplinary area (e.g., multicultural education). May be repeated for credit when course content varies.

EDF 694  Dir St and Research  1 TO 3 cr
Exploration of problems and issues of special interest or significance for advanced students. No more than three semester hours of any departmental 694 courses can be accepted toward a degree.

Educational Leadership (EDL)

EDL 595A  Internship A  1 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.
Co-requisite: EDL 513

EDL 595B  Internship B  1 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.
Co-requisite: EDL 517

EDL 595C  Internship C  1 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.
Co-requisite: EDL 525

EDL 595D  Internship D  1 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.
Co-requisite: EDL 550

EDL 595E  Internship E  1 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.
Co-requisite: EDL 557
EDL 595F  Internship F - Related Topics  1 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.

EDL 699A  Research Project  1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

EDL 699B  Research Project  1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

EDL 699C  Research Project  1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 692 Minimum Grade of B.

EDL 798A  Research Project  1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 792 Minimum Grade of B.

EDL 798B  Research Project  1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 792 Minimum Grade of B.

EDL 798C  Research Project  1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 792 Minimum Grade of B.

EDL 410  Leadership Development  1 cr
This course is for undergraduates who are, or aspire to be, leaders. Faculty from throughout the University will direct weekly class sessions. Requires permission of the Dean of Students.

EDL 501  Theories Instructnl Leadership  3 cr
The need for instructional leaders to understand and be able to operate within the larger context of community effect on opportunities for all students is addressed. Cooperation among schools, the district, parents, and the larger community as essential to the success of instructional leaders and students and ethical practices are emphasized.

EDL 502  Data-Driven Instructnl Leadership  3 cr
This course stresses the engagement of the school community in developing and maintaining a shared vision; planning effectively; using critical thinking and problem-solving techniques; collecting, analyzing, and interpreting data; allocation of resources; and evaluation of results for the purpose of continuous school improvement.

EDL 503  Supervision & Prof Development  3 cr
This course addresses how the instructional leader recruits, selects, organizes, evaluates, and mentors faculty and staff to accomplish school and system goals.

EDL 504  Ethical & Legal Dimens Sch Ldr  3 cr
Students completing this course will demonstrate understanding of the legal system of schools. Students will be able to relate constitutional, federal, state, and local requirements as they concern students, employees, teachers, and instructional program administration. The student will demonstrate an understanding of the concepts of honesty, integrity, and fairness.

EDL 505  Bus Mgmt of Lrng Organizations  3 cr
This course explores leadership skills related to group dynamics, problem identification, accountability, diversity, economic levels, and their relationship to financing schools. Internal and external public relations and political factors which impact the funding of school will also be presented.

EDL 506  Teaching and Learning Leaders  3 cr
Student will acquire the knowledge to ensure that decisions about curricular, instructional strategies, assessment and professional development are based on sound research, best practices, and other contextual information needed to align the curricula with student needs.

EDL 510  Theories of Adlt Tchg & Lrng  3 cr
This course is an introduction to the pedagogy of teaching adult learners. Topics will include basic instructional design, strategies to meet needs of adult learners, higher order questioning, student assessment, and mechanisms for providing feedback to students. The class will model effective teaching and assessment practices. Participants will be expected to demonstrate effective teaching in a summative class presentation.

EDL 512  Community Development  3 cr
Presents the field of community development, including basic terminology, concepts, methods and literature. Purposes are to present conceptual foundations of community development, provide some experiences in practical application, and lay foundations for further study and practice in the field.
EDL 513 Instr Lead and Curr Dev  3 cr
Students in this course will learn to participate in the process of instructional improvement, adaptation to the needs of children and local communities, and instructional leadership within schools. The course will include staff development, instructional evaluation and assessment, school effectiveness concepts, government requirements, cultural diversity, curriculum development, problem solving, small group leadership, conflict management, empowerment, professional ethics, and other interpersonal skills applied to instructional development situations.
Co-requisite: EDL 595A

EDL 517 Education Law  3 cr
Students completing this course will demonstrate understanding of the legal system of schools. Students will be able to relate to constitutional, federal, state, and local requirements as they concern students, employees, teachers, and instructional program administration. Students will understand statutory rights of certified and non-certified personnel in Alabama, including due process, tenure, transfer, suspension, and termination, and will be able to investigate legal matters affecting the administration of schools.
Co-requisite: EDL 595B

EDL 525 School Finance  3 cr
This course explores leadership skills related to group dynamics, problem identification, accountability, diversity, economic levels, and their relationship to financing schools. Internal and external public relations and political factors which impact the funding of school will also be discussed. Fiscal management, including the Alabama Local School Accounting and Reporting system, will be analyzed.
Co-requisite: EDL 595C

EDL 530 School Dist Leadership  3 cr
This course describes the unique forces that shape the role and functions of the school superintendent. The management of conflict is explored as well as the management of all aspects of this school system. The concept of the administrative team is also explored and examined.

EDL 545 Secondary School Leadership  3 cr
Provides understandings and skills in the leadership and management of secondary schools. Emphases are placed upon the administrator’s role in staff and student personnel administration, program development, and building operations.

EDL 546 Elem School Leadership  3 cr
Provides an understanding of the organizational and various other characteristics of a good elementary school with emphasis on leadership.

EDL 549 Practicum in Educ Supv  3 cr
The practicum is a supervised learning experience in several settings which simulates the work situations of educational supervision. An opportunity is provided to apply the theories and concepts learned during the student's graduate program.

EDL 550 Prin of School Lead  3 cr
This course provides understanding and skills in the leadership and management of schools, including elements of effective classroom management, monitoring student services, and school and community relations. Management skills associated with school facilities, transportation, and student records will be studied.

EDL 557 Supervisory Leadership  3 cr
Students completing this course will learn to work with teachers in improving classroom instruction. Students will demonstrate the ability to collect classroom information, including assessment and evaluative data; coordinate student service needs; direct teachers using leadership, motivational techniques, professional ethics, and school management; and use techniques such as personnel selection, stress management, conflict management, scheduling, and research in adapting instruction to the changing needs of the community.
Co-requisite: EDL 595E

EDL 561 Dev of Postsecondary Education  3 cr
This course provides an overview of the organization, development and characteristics of postsecondary education.

EDL 562 Student in Higher Education  3 cr
This course focuses on the demographics and characteristics of the American college student today. Development theories applicable to the diverse population of students (e.g., race, ethnicity, age, gender, sexual orientation, disability) are introduced and examined.

EDL 573 Educational Gerontology  3 cr
Will introduce the students to the organization and administration of programs of instruction of and about older persons, instruction of general or specific audiences about aging, and instruction of professionals working with or on the behalf of older persons.

EDL 575 Org and Plan Postsec Educ  3 cr
Designed as an introduction to and an analysis of organizational and administrative features of postsecondary education.

EDL 578 Law and Postsecondary Educ  3 cr
Explores court decisions and federal and state laws relating to governance, student rights, and tort liability in postsecondary education.
EDL 590  Sp Top - 1 TO 3 cr
Guided supervision in the identification and completion of educational tasks, such as program design, program revision, self study for accreditation visitation, supervision in the organization, and application of selected learning activities to acquire and enhance leadership skills.

EDL 594  Dir St and Research 1 TO 3 cr
Exploration of problems and issues of special interest or significance in Educational Leadership. Not more than three semester hours of any departmental 594 courses can be accepted toward a degree.

EDL 595  Internship 1 TO 6 cr
The internship is a supervised learning experience in several work settings which simulates the reality of Educational Leadership work situations. The internship provides an opportunity to apply the theories and concepts learned during the student's graduate program. Students are expected to complete no less than 50 hours for each semester hour earned.

EDL 598  Residency - 1 TO 6 cr
The residency is designed to place candidates in the cooperating school during critical times of instructional planning. The residency allows interns to experience leadership in as many of the Alabama Leadership Standard indicators as possible. Candidates shall prepare and maintain a comprehensive portfolio which indicates the level of experiences and knowledge gained in instructional leadership during the intern experiences.

EDL 603  Curr Prob and Iss Ed Adm 3 cr
Explores problems and issues at the federal, state, and local levels facing the administration and supervision of American educational institutions. Particular emphasis is on decision making affecting education.

EDL 607  Lead Schs/Multicultural Soc 3 cr
Students will examine the role of educational leaders in schools with diverse student populations and study strategies to address race, class and gender inequities that exist in schools.

EDL 611  Human Relations Skills 3 cr
Designed to assess and improve the student's level of competency in communication and group leadership skills, knowledge of socio-cultural influences and differences, and understanding of the developmental characteristics of human beings.

EDL 621  Sem Prog Curriculum Dev 3 cr
Designed to assess and improve the student's level of competency in program development skills, instructional strategies, systems analysis, and change innovation.

EDL 631  Sem Ed Management Skills 3 cr
Designed to assess and improve the student's knowledge of decision-making styles, problem-solving processes, leadership skills, implementation of organizational change, and physical environments which promote productivity. Additionally, when appropriate to the candidate's expected leadership position, current knowledge of law, finance, plant management, and professional negotiations will be stressed.

EDL 689  Quantitative/Action Research 3 cr
Basic principles of quantitative and action research for decision making and problem solving in the educational environment.

EDL 690  Sp Top - 1 TO 3 cr
May be a content-varying course or may be guided supervision in the identification and completion of educational tasks as well as supervision in the organization and application of selected learning activities to acquire and enhance leadership skills. May be repeated for credit when course content varies.

EDL 694  Dir St and Research 1 TO 3 cr
Students explore problems and issues of special interest or significance to advanced students. Not more than three semester hours of any department 694 courses can be accepted toward a degree.

EDL 695  Mentoring Leadership 3 cr
This course is a learning experience in mentoring relationships. The course provides an opportunity to apply the theories and concepts learned during the student's advanced graduate studies. The student will learn mentoring skills and serve as a mentor for students interested in educational administration or new to the field of administration.

EDL 699  Research Project 1 TO 3 cr
A supervised field project, study, or investigation in Educational Leadership. The student will conduct an investigation and apply concepts and skills learned during the sixth-year program. Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

EDL 701  Adv Organizational Theory 3 cr
An in-depth exploration of organizing in educational settings. Organizational theories and models are examined, as is their application to educational settings, particularly when challenges or changes are introduced.

EDL 702  School Finance 3 cr
General study of finance at local, state, and federal basis. Include principles of taxation, the concepts of equity and adequacy, acceptable practices in securing and administering school funds, and acceptable accounting and business procedures. Explores the unique characteristics of the Alabama Tax structure, its history, and impact on the funding of education.
EDL 703 Adv School Leadership 3 cr
This course explores research-based practices of effective leadership in P-12 education settings. The role of mission and vision in the leadership of an organization, decision-making models, and leadership styles will be explored.

EDL 720 Global Education 3 cr
This course focuses on similarities and differences in the ways various countries educate their citizens from early childhood to adult learners.

EDL 732 Ethics and Law for Ed Leaders 3 cr
An examination of ethical and legal issues present in educational settings, including primary, secondary, and postsecondary education.

EDL 799 Research/Dissertation 1 TO 12 cr
Directed dissertation research in the field of educational leadership. Faculty advisor approval required.

Educational Media (EDM)

EDM 595A Internship A 1 cr
The internship is a supervised learning experience in a work setting similar to that in which a media specialist eventually will be employed.
Pre-requisite: EDM 581 Minimum Grade of B.

EDM 595B Internship B 1 cr
The internship is a supervised learning experience in a work setting similar to that in which a media specialist eventually will be employed.
Pre-requisite: EDM 580 Minimum Grade of B.

EDM 595C Internship C 1 cr
The internship is a supervised learning experience in a work setting similar to that in which a media specialist eventually will be employed.
Pre-requisite: EDM 583 Minimum Grade of B.

EDM 310 Microcomputing Systems 3 cr
Basic understanding of current and emerging technologies for instructional purposes. Requires a special fee.

EDM 312 Ed Tech - 3 cr
Application of current educational technology in various instructional environments. Laboratory experience is given with selected software programs. May be repeated when technological application changes.

EDM 385 Methods Instr Comm 3 cr
Application of current concepts in communication and instructional system design to elementary and secondary teaching. Operation of basic mediaware and overview of literature related to media use are stressed.

EDM 482 Prep Instr Materials 3 cr
Basic elements in the planning preparation, and evaluation of teacher-produced instructional materials.

EDM 490 Sp Top - 3 cr
Investigation of contemporary topics of interest in Educational Media. Requires permission of the department.

EDM 494 Dir St - 1 TO 3 cr
Directed study in Educational Media. No more than two directed studies can count toward the Bachelor's degree. Required departmental approval.

EDM 510 Microcomputing Systems in Ed 3 cr
Application of current and emerging technologies that support and enhance instruction and can be used to improve student achievement.

EDM 520 Research in Ed Tech 3 cr
Introduction to history and theories of computer use in education.

EDM 530 Workshop in Educ Media 1 TO 9 cr
In-depth study and operational experience in current trends and techniques in educational media research.

EDM 533 Curriculum Media for Children 3 cr
This course explores media used for learning and enjoyment with children in preschool through grade eight. Other topics include: the professional roles and responsibilities of a collection developer, the influence of child development and curriculum on collection development, an overview of the marketplace, strategies to encourage teachers to use media center materials in teaching, and related research.

EDM 540 Curr Media for Children & Yth 3 cr
This course initiates or extends a student's knowledge of how to identify, select, and use library media resources for students in grades 6 through 12. Other topics include: the role of a library media specialist in establishing and maintaining a collection of resources; steps that can be taken to encourage students and teachers to use the collection; related research; and ways professionals can keep abreast of the latest knowledge, practices, and resources.

EDM 552 Curr Media for Young Adults 3 cr
This course focuses on the role of the library media specialist in teaching students and instructional staff how to select, evaluate, and use information from print, non-print, and online sources. Emphasis is placed on information access, retrieval, and interpretation; advanced research techniques; copyright laws; and lessons and projects that utilize research information.
EDM 581  Media Center Management  3 cr
This course covers the procedures and routines for effective
media center management, including acquiring, organizing,
classifying, cataloging, maintaining, and inventorying a
relevant collection. Other topics include: selecting resources
to support the total curriculum and budget, responding to
the needs of a school's demographic population, assisting
students and teachers in the application of information skills,
and applying the fundamentals of library design to achieve
an effective environment for learning and leisure use.

EDM 582  Prod of Curriculum Media  3 cr
Provides instruction in the elements of planning, preparation
and evaluation of professional circular materials for group
and individual instruction.
Pre-requisite: EDM 510 Minimum Grade of B or EDM 520
Minimum Grade of B.

EDM 583  Library Media Programs  3 cr
This course covers the professional responsibilities for
planning, implementing, and evaluating a library media
program that serves a school program. Emphasis is placed
on curriculum, leadership, environment, teaching and
learning styles, a planning model, collaboration, staff
development, program administration and evaluation
activities, and ways in which research can be used to help
shape an effective program.

EDM 584  Educational Technology Design  1 TO 3 cr
Design and evaluation of information technology hardware,
software, and networked information resources that support
classroom pedagogy, educational administrative services,
and student learning.
Pre-requisite: EDM 520 Minimum Grade of B and ISD 581
Minimum Grade of B.

EDM 585  Admin Educ Media Center  3 cr
General practices and procedures for establishing,
organizing and operating the media center. Students submit
plans for hypothetical or actual situations.

EDM 590  Sp Top -  0 TO 3 cr
Presents topics of contemporary interest in the area of
Educational Media.

EDM 591  Trends and Issues in Ed Tech  3 cr
Students will investigate current research as well as discuss
emerging trends and developmental issues in the fields of
educational media and instructional technology and their
use as a pedagogical tool in P-12 schools.
Pre-requisite: EDM 510 Minimum Grade of B or ISD 581
Minimum Grade of B.

EDM 594  Dir St and Research -  1 TO 3 cr
Students explore problems and issues of special interest
or significance in Educational Media. Not more than three
semester hours may be accepted toward degree programs.

EDM 595  Internship -  1 TO 9 cr
The internship is a supervised learning experience in a work
setting similar to that in which a media specialist eventually
will be employed. Departmental approval is required.

EDM 599  Thesis  1 TO 9 cr
A student selects a project, study or investigation related to
the area of specialization in Educational Media. The project
forms a basis for the thesis. A thesis committee provides
direction during the investigation and during the writing of
the thesis.

EDM 610  Adv Prod Curric Media  3 cr
The planning, design and preparation of photographic
and audio instructional materials will form the basis of
comprehensive, sophisticated, software systems.

EDM 685  Administering Ed Media Center  3 cr
Practices and procedures for administering the educational
media center.

EDM 689  Info Storage and Retrieval  3 cr
Examination and application of computer systems to school
library media centers.

EDM 690  Sp Top -  3 cr
Presents topics of contemporary interest in the area of
Educational Media.

EDM 696  Adv Ref and Selection Resource  3 cr
Bibliographic organization and reference use of professional
resources in education, including governmental documents,
publications of educational associations, professional
journals and indices, research reports and computerized
bibliographies.

EDM 698  Advanced Cataloging  3 cr
Modern trends in cataloging with emphasis on standards for
cataloging and educational media.

EDM 699  Research Project  3 cr
Provides an opportunity to synthesize and apply the various
program components in a selected instructional setting. May
be repeated for a total of 6 semester hours.

Educational Psychology
(EPY)

EPY 251  Human Growth and Development  3 cr
A study of the physical, mental, social and emotional
development of young people from conception to late
adolescence.
EPY 315  The Adolescent in School  3 cr
Assists future educators to understand adolescent development and behavior of students in the middle and high schools. Issues and problems include the school's role in the social, emotional, and intellectual development of middle and secondary school students from diverse multicultural backgrounds; student-teacher and peer relationships; and the academic and vocational planning process.

EPY 351  Human Growth & Development  3 cr
A study of the physical, mental, social and emotional development of young people from conception to late adolescence.

EPY 355  Eval of Teaching-Learning  3 cr
The application of formative and summative evaluative concepts in building and interpreting tests in the educational setting.

EPY 455  Eval of Teaching-Learning - W  3 cr
The application of formative and summative evaluative concepts in building and interpreting tests in the educational setting.

EPY 490  Sp Top -  3 cr
Study of a significant topic, theory, model or problem in behavioral studies. May be repeated once for credit when content varies.

EPY 494  Directed Study  1 TO 3 cr
Directed individual study and research. Consent of department chair is required. (No more than two directed studies can be counted toward the Bachelor's degree and Class B Certificate).

EPY 502  Psy Prin Learning  3 cr
Psychology of learning as it pertains to education. Emphasis is on both the practical application of learning principles in educational and training classroom situations and theories of learning.

EPY 521  Human Dev and Behavior  3 cr
A study of the crucial developmental principles of human development and behavior focusing on: developmental tasks over the life span; growth patterns of the diverse subcultures emphasizing attitudes, values, and learning styles; family, school, and community impact on people of all ages living and growing in a multicultural society.

EPY 525  Assessment & Research in Educ  3 cr
This course is offered as part of the Alternative Masters Degree in Education. Upon completion of the course, students will be able to construct, evaluate, administer, and interpret classroom and school-related assessment. In addition, students will be prepared to be effective consumers of research reports, writings, and results in professional literature in their field.

EPY 555  Tests-Measurement and Eval  3 cr
Understanding and interpreting the meaning of test scores. Technical qualities desired in a test. Techniques for obtaining information about clients and/or students. Using this information in counseling, consulting, and teaching. Cultural bias in tests. Problems of testing and obtaining information about clients and/or students with diverse backgrounds.

EPY 556  Ed Testing - Wechsler Scales  3 cr
Includes basic theories of intelligence, basic concepts and principles of intelligence testing, extensive practice in administering, scoring and interpreting the Wechsler Adult Intelligence Scale, the Wechsler intelligence Scale for Children and the Wechsler Preschool and Primary Scales of Intelligence in a wide variety of educational settings. Pre-requisite: EPY 555 Minimum Grade of B.

EPY 557  Ind Intel Test -Stanford-Binet  3 cr
Includes basic theories of intelligence, basic concepts and principles of intelligence testing, extensive practice in administering, scoring and interpreting the Stanford-Binet Scale in a variety of educational settings. Competencies in consulting with professional personnel and with parents will be emphasized. Pre-requisite: EPY 555 Minimum Grade of B.

EPY 558  Ed Testing - Kaufman Scales  3 cr
The Kaufman Assessment Battery for Children and the Kaufman Adolescent and Adult Scale are the basic instruments used for extensive practice in administering, scoring, and interpretation of intelligence. The various theories of intelligence, especially those of Horn and Cattel, Luria, Sperry and Neisser are emphasized. Pre-requisite: EPY 555 Minimum Grade of B.

EPY 590  Sp Top -  3 cr
Guided supervision in the completion of learning tasks in educational psychology such as program design and revision, study of a significant topic, theory, model, and supervision of selected learning activities to acquire specific counseling and testing skills.

EPY 594  Dir St and Research  1 TO 3 cr
Students explore through directed study of problems and issues of special interest or significance in Educational Psychology. Not more than three semester hours of any departmental 594 courses can be accepted toward a degree program.

EPY 602  Advanced Theories of Learning  3 cr
A study of the major psychological theories, models, research and principles that apply to the teaching and learning process. Special attention will be given to cognitivistic approaches. Pre-requisite: EPY 502 Minimum Grade of B.
EPY 610  Indiv Diff Among Learners  3 cr
Examination of individual and developmental differences as related to learning, performance and behavior. Intelligence attitudes, cognitive and learning styles, anxiety, prior knowledge, and locus of control are among the topics discussed. Models and methods for using learner characteristics in instructional design, teaching practices, and research are considered.

Electrical Engineering (EE)

EE 220  Circuit Analysis I  3 cr
Resistive networks with independent and dependent sources: Ohm's law; Kirchhoff's law; nodal and loop analysis; network theorems; energy storage elements (capacitors and inductors); operational amplifiers; steady state AC analysis; and introduction to PSPice. Fee. Pre-requisite: EE 263 Minimum Grade of C or CSC 228 Minimum Grade of D. EE 227 can be taken concurrently with this course.

EE 223  Network Analysis  3 cr
Transient analysis of RLC circuits; Three-phase systems; power-factor correction in three-phase power systems; magnetically coupled networks; Operational amplifiers; network frequency response functions and resonance; Fourier series. Pre-requisite: EE 223 Minimum Grade of D and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D). EE 227 can be taken concurrently with this course.

EE 227  Circuits and Devices Lab  1 cr
Introduction to electrical laboratory equipment and instrumentation; analog and digital meters, oscilloscopes, bridges, power supplies, function generators. Measurement of voltage, current and power in DC networks and in single-phase and three-phase AC networks. Verification of Kirchhoff's laws. Measurement of resistance, capacitance, and inductance. Corequisite: EE 223 and credit for or concurrent registration in EH102. Fee. Pre-requisite: EE 223 Minimum Grade of D and and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D). EE 223 and EH 102 can be taken concurrently with this course.

EE 228  Digital Logic Design Lab  1 cr
A series of digital logic circuit experiments and simulations using TTL/CMOS integrated circuits designed to reinforce the material presented in EE 263. Design projects include standard SSI and MSI digital circuit based simulation and experiments. Fee. Pre-requisite: EE 263 Minimum Grade of C or CSC 228 Minimum Grade of D and EE 227 Minimum Grade of D. EE 227 can be taken concurrently with this course.

EE 302  Computer Methods in EE - CpE  1 cr
Introduction to the use of computer softwares such as MATHCAD/ MATLAB and PSPICE/ ELECTRONIC WORKBENCH for the analysis of engineering related problems and the solution of electric/ electronic circuits. Pre-requisite: EE 223 Minimum Grade of C and EE 263 Minimum Grade of C.

EE 321  Signals, Systems & Transforms  3 cr
Modeling of analog and discrete-time signals and systems, time domain analysis, Fourier series, continuous and discrete time Fourier transforms and applications, sampling, z-transform, state variables, analysis of signals and systems and basic filter design, filter implementation using MatLab. Fee. Pre-requisite: EE 223 Minimum Grade of D and MA 238 Minimum Grade of C.

EE 322  Prob, Rand Sigs & Stat Anlys  3 cr
Discrete and continuous probability distributions; random variables: Bernoulli trials; hypothesis testing; confidence intervals; Anova multiple comparisons; Bayes' theorem; estimation; sampling; random processes and random signals in linear systems. Probability applications in computer and electrical engineering. Fee. Pre-requisite: (MA 238 Minimum Grade of C or MA 338 Minimum Grade of D) and EE 221 Minimum Grade of D. EE 321 can be taken concurrently with this course.

EE 328  Feedback Control Systems  3 cr

EE 331  Physical Electronics  3 cr
Introduction to quantum concepts; particles in one dimensional potential well; tunneling. Silicon band structure, electrons and holes. Drift and diffusion current density; band bending; Einstein diffusion coefficient; recombination/generation. The pn junction; step and linear junctions; depletion layer. I-V characteristics of a pn junction and steady-state carrier concentrations at junctions. Bipolar junction transistor fundamentals; pnp and npn types; common emitter configuration, biasing and gain. Fee. Pre-requisite: MA 238 Minimum Grade of C and PH 202 Minimum Grade of C and CH 131 Minimum Grade of C.
EE 334  Digital Electronics  3 TO 4 cr
Review of semiconductor diodes and Diode circuits, Field
effect devices. Operating characteristics and DC analysis.
Introduction to digital electronics, NMOS, PMOS, CMOS
devices and logic circuits, Transmission gates, Review of
BJTs TTL logic gates, Design considerations.
Pre-requisite: EE 331 Minimum Grade of D.

EE 337  Electronics Lab  1 cr
Computer analysis and measurement of the characteristics
and parameters of power supplies; operations amplifiers;
voltage and power amplifiers; oscillators and active filters.
Credit for or concurrent registration in EE 334.
Pre-requisite: EE 334 Minimum Grade of D and EE 431
Minimum Grade of D. EE 431 can be taken concurrently
with this course.

EE 354  Electromagnetics I  3 cr
Basic concepts of electrostatics, electric potential theory,
electric fields and currents, fields of moving charge,
Poisson's and Laplace's equations, magnetostatics, metallic
conductors and dielectric materials, electric-scalar and
magnetic-vector potentials and boundary conditions, general
time varying fields and Maxwell's equations.
Pre-requisite: MA 237 Minimum Grade of D and MA 238
Minimum Grade of C and PH 202 Minimum Grade of C.

EE 355  Electromagnetics II  3 cr
Lumped versus distributed circuit components, capacitance,
inductance and mutual inductance, uniform plane waves,
power flow and skin effect, reflection, transmission and
propagation of uniform plane waves through different media,
wave polarization, transmission lines, waveguides, optical
fiber, electromagnetic radiation and antennas, the Radar
equation.
Pre-requisite: EE 354 Minimum Grade of D.

EE 356  Electromagnetics Laboratory  1 cr
Computer-aided and experimental field mapping; shielding
techniques; field measurement of elementary radiating
structures and waveguide circuits; terminal characteristics
of klystrons and space wave propagation losses. Fee.
Pre-requisite: EE 355 Minimum Grade of C. EE 355 can be
taken concurrently with this course.

EE 368  Microprocessor Sys Interf Lab  1 cr
This Laboratory is designed to reinforce the material
covered in EE 264 and to provide practical hands-on
experience with microprocessor software, hardware and
interfacing. Topics include integration of microprocessor
software, hardware and peripheral devices; assembly
level programming and hardware interfaces for control and
instrumentation.
Pre-requisite: EE 268 Minimum Grade of D and EE 264
Minimum Grade of D. EE 264 can be taken concurrently
with this course.

EE 372  Introduction to Communications  3 cr
Introduction to communication systems; analog, digital,
deterministic and stochastic messages; modulation;
redundancy coding. Signal energy and power; correlation;
orthogonal signal set and Fourier series. Fourier transforms;
signal transmission through linear systems; ideal and
practical filters; signal distortion; Parseval's theorem;
essential band-width and energy and power spectral
density. Amplitude modulation: DSB, SSB, AM, QAM
and VSB; phase and frequency modulation and the basic
design of a FM transmitter. Sampling theorem; pulse code
modulation and differential pulse code modulation.
Pre-requisite: EE 322 Minimum Grade of D and EE 321
Minimum Grade of D. EE 322 can be taken concurrently
with this course.

EE 381  Electromech Energy Conversion  3 cr
Introduction to the principles of electromechanical
energy conversion. Energy balance, force, and torque
of electromagnetic systems; magnetic circuits and
ferromagnetic losses; transformers and their connections
three-phase induction motors; synchronous generators
and motors; non-salient machines. Parallel operation of
synchronous generators. Dynamics of electric machines.
Fee.
Pre-requisite: EE 354 Minimum Grade of D. EE 354 can be
taken concurrently with this course.

EE 385  Energy Conversion Lab  1 cr
Laboratory experiments based on: Faraday's Law and
magnetic coupling; magnetic circuits; transformers (single
and three phase) their connections and tests. Three phase
induction motors-tests and performance characteristics;
synchronous generators and motors. Machine data
acquisition methods and processing using a computer. Fee.
Pre-requisite: EE 381 Minimum Grade of D. EE 381 can be
taken concurrently with this course.

EE 401  Intro Elec and CpE Design - W  1 cr
Specification of design criteria. Written and oral
presentations of design proposals. Coverage of professional
and contemporary issues and students are required to
become members of the IEEE or ACM and attend two
technical meetings of IEEE/ACM. Fee.
Pre-requisite: CA 110 Minimum Grade of D and EE 321
Minimum Grade of D and EE 334 Minimum Grade of D
and EE 368 Minimum Grade of D. EE 334 and EE 368 can be
taken concurrently with this course.

EE 404  Electrical and Computer Engine  3 cr
Implementation of design project from the field of Electrical
or Computer Engineering in the broadest sense and under
the guidance of a project director from the electrical and
computer engineering faculty. Written and oral presentations
of project proposals, interim and final reports. Students are
required to be current members of the IEEE/ACM and
attend two technical meetings. Fee.
Pre-requisite: EE 328 Minimum Grade of D and EE 334
Minimum Grade of D and EE 368 Minimum Grade of D and
EE 401 Minimum Grade of D.
COURSES

EE 422  Adv Feedback Control Systems  3 cr
Sensors, encoders and DC motors in control systems. The performance and design of feedback control systems. System bandwidth; Nichol's Chart and the stability of control systems with time delays. State variable analysis and design. This course is dually listed with an equivalent graduate level course (EE522) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Pre-requisite: EE 328 Minimum Grade of D.

EE 423  Modern Control Theory  3 cr
Simulation and modeling; introduction to linear systems theory; concepts of controllability and observability; specifications; structures and limitations; review of classical design methods; state feedback design methods; multivariable control; robust stability and sampled data implementation. Introduction to the use of MATLAB for design. This course is dually listed with an equivalent graduate-level course (EE 523) and requires a minimum G.P.A of 2.75 or the instructor's permission for admission. Pre-requisite: EE 328 Minimum Grade of D.

EE 424  Nonlinear Control Systems  3 cr
State space description; methods of linearization; isoclines; stability of nonlinear systems; Lyapunov's direct method; harmonic linearization; describing functions; dual input describing functions; Popov's method; circle criterion and computer aided analysis. This graduate-level course is dually listed with an equivalent course (EE 524) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Pre-requisite: EE 328 Minimum Grade of D.

EE 425  Prog Logic Controller Lab  1 cr
PLC overview; ladder logic; programming of timers and counters; programming control; data manipulation and math; instructions; sequencers and shift register instructions; data acquisition methods. Pre-requisite: EE 334 Minimum Grade of D.

EE 427  Digital Control Systems  3 cr
State space and transfer function description of discrete-time systems; solution of discrete state equation; discrete-time model of analog plants; frequency domain analysis; design of discrete state-feedback regulators; observers and tracking systems. This course is dually listed with an equivalent graduate-level course (EE 527) and requires a minimum G.P.A. of 2.75 or the instructors permission for admission. Pre-requisite: EE 328 Minimum Grade of D.

EE 430  Power Semiconductor Dev  3 cr
Characteristics of power devices; physics of transport phenomena; breakdown voltage; power rectifiers; bipolar transistors; power MOSFET; insulated-gate bipolar transistor and MOS-gated thyristors. Pre-requisite: EE 331 Minimum Grade of D.

EE 431  Analog Electronics  3 cr
Small signal model of diodes and application, advanced OP-AMP applications, Miller's Theorem, Nyquest stability criterion and frequency response, principle of operation of FETs small signal model of FETs basic FET amplifiers, small signal model of BJT and basic BJT amplifiers, differential and multistage amplifiers, internal circuit of typical OP-AMP. Pre-requisite: EE 334 Minimum Grade of D.

EE 432  Microelectronic Devices  3 cr
Introduction to semiconductor material properties; semiconductor diodes; structure and operation; diode circuit applications; bipolar transistor; structure and operation; junction field effect transistors (JFETs); metal oxide field effect transistors (MOSFETs) fabrication technology and construction of semiconductor devices; biasing and stability of amplifiers. This course is dually listed with an equivalent graduate-level course (EE 532) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee. Pre-requisite: EE 334 Minimum Grade of D.

EE 433  VLSI Technology-Fabrication  3 cr
Introduction to semiconductor devices; crystal growth and wafer preparation; chemical and physical vapor deposition; oxidation; diffusion; ion implantation; lithography; etching metallization, process integration of CMOS and bipolar technologies; diagnostic techniques and measurements; packaging; yield and reliability. This course is dually listed with an equivalent graduate-level course (EE 539) and requires a minimum G.P.A. of 2.75 or the instructor's permission for admission. Pre-requisite: EE 331 Minimum Grade of D.

EE 434  VLSI Technology-Synthesis  3 cr
Introduction to the syntax and elements of the basic VHDL language such as entities and architectures; creating combinational, synchronous logic and state machines using both structural and behavioral VHDL; using hierarchy in large designs; synthesizing and implementing designs. This course is dually listed with an equivalent graduate-level course (EE 540) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Credit for both EE 440 and EE 443 not allowed toward a degree. Fee. Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D.
EE 441 Computer Networks 3 cr
Introduction to design and analysis of computer networks. Polling networks and ring networks. This course is dually listed with an equivalent graduate-level course (EE 541) and requires a minimum GPA of 2.75 or the instructor's permission for admission.
Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D.

EE 443 HDL Logic Simulation 3 cr
Introduction to the syntax and elements of the basic Verilog language such as modules and ports; hierarchical modeling; gate-level modeling; dataflow modeling; switch-level modeling; tasks and functions; timing and delays; user-defined primitives; synthesizing and implementing designs. Emphasis is on the simulation and test-bench aspects. This course is dually listed with an equivalent graduate-level course (EE 543) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Credit for both EE 440 and EE 443 not allowed toward a degree. Fee.
Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D.

EE 444 Wireless Networks 3 cr
Introduction to modern wireless networks/systems, the cellular concept, frequency reuse, interference and system capacity improvement, trunking and grade of service, multiple access techniques, wireless/wireline interworking, and advanced networks (i.e. ad hoc networks). This course is dually listed with an equivalent graduate-level course (EE 544) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee.
Pre-requisite: EE 441 Minimum Grade of D.

EE 446 Embedded System Design Lab 1 cr
Design projects utilizing 16-bit and 32-bit microprocessor hardware and software; interfaces to memory and peripheral devices. Prior credit for or concurrent registration in EE 447.
Pre-requisite: EE 457 Minimum Grade of D. EE 457 can be taken concurrently with this course.

EE 447 Programmable Logic Devices Lab 1 cr
Digital design projects utilizing simulation and synthesis CAD tools and targeting programmable logic devices. Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D.

EE 449 Control and Communications Lab 1 cr
Computer-aided modeling, design and performance analysis in time and frequency domain of analog and digital communication end-to-end systems, and automatic control systems.
Pre-requisite: EE 328 Minimum Grade of D and EE 372 Minimum Grade of D. EE 372 can be taken concurrently with this course.

EE 450 Fundamentals of Fourier Optics 3 cr
Two-dimensional Fourier analysis; linear systems; sampling theory; scalar diffraction theory. Fourier transform imaging properties of lenses; frequency analyses of diffraction-limited coherent and incoherent imaging systems; aberrations and resolution analysis; Vander Lugt filters and frequency domain analysis and synthesis; SAR and pattern recognition applications.
Pre-requisite: EE 331 Minimum Grade of D and EE 355 Minimum Grade of D.

EE 452 Microwave Engineering 3 cr
Generation and transmission of high frequency electromagnetic energy; magnetrons, klystrons, masers, parametric amplifiers, traveling wave tubes and solid-state devices; waveguides and resonators. This course is dually listed with an equivalent graduate level course (EE 552) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee.
Pre-requisite: EE 355 Minimum Grade of D.

EE 453 Antenna Theory and Design 3 cr
Radiation fundamentals; linear antennas; loop antennas; aperture antennas; reflector antennas; antenna impedance and measurements; computer-aided design of antenna systems. This course is dually listed with an equivalent graduate-level course (EE 553).
Pre-requisite: EE 355 Minimum Grade of D.

EE 454 Digital Computer Architecture 3 cr
Computer organization; instruction set design; ALU design; control unit design; I/O and interrupt designs; memory organization; DMA; microprogramming; introduction to multiprocessors; performance analysis. This course is dually listed with an equivalent graduate level course (EE 554) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee.
Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D.

EE 455 Optoelectronics 3 cr
Wave propagation in free-space and in wave guides; optical resonators; interaction of radiation and atomic systems; laser oscillation; solid-state lasers. He-Ne and Argon lasers, integrated optics including integration of emitters and detectors; optical interconnects; spatial light modulators; optoelectronic materials and devices; and applications of optoelectronics. This course is dually listed with an equivalent graduate-level course (EE 555) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee.
Pre-requisite: EE 355 Minimum Grade of D.

EE 456 Fiber Optic Communication Sys 3 cr
Review of optical principles, dielectric waveguides, signal propagation, degradations and attenuation of fibers. Fiber interconnection devices, active and passive components, optical transmitters and receivers, power budget, fiber optic communication systems. This course is dually listed with an equivalent graduate-level course (EE 556).
Pre-requisite: EE 355 Minimum Grade of D.
EE 457  Embedded System Design  3 cr
Architecture and software of 16-bit and 32-bit microprocessor hardware and software; interface design to memory and peripheral devices; multiprocessing. This course is dually listed with an equivalent graduate level course (EE 557) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee. Pre-requisite: EE 264 Minimum Grade of D and EE 368 Minimum Grade of D.

EE 458  Radar Systems  3 cr
Introduction to radar signal processing. Continuous wave and pulsed radars. Clutter and radio wave propagation. Moving target indicator, target surveillance and tracking radar systems. Side-looking, synthetic aperture, interferometric and other airborne radars. This course is dually listed with an equivalent graduate level course (EE 558) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee. Pre-requisite: EE 321 Minimum Grade of D.

EE 465  Digital Signal Processing  3 cr
Review of discrete Fourier and Z-transforms; review of analog filter design; design of IIR and FIR digital filters. Fast Fourier transform (FFT) and applications; Hardware implementation and quantization effects. Advanced digital filter structures and design. DSP algorithm design and implementation. Analysis of finite word length effects of DSP applications. Extensive use of MatLab for analysis and design. Pre-requisite: EE 321 Minimum Grade of C.

EE 466  Programmable Logic Controllers  3 cr
Hardware and software principles of PLC devices, ladder logic, hardware components of PLC systems and controller configuration, basic PLC operation, program construction and manipulation, advanced operation and networking. Fee. Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D.

EE 469  Signal Integrity  3 cr
Design techniques for high-speed digital interfaces and circuit boards; signal integrity including crosstalk and ground bounce; electromagnetic aspects of high-speed digital design; frequency-domain analysis of power-system integrity; state-of-the-art buses and standards. This course is dually listed with an equivalent graduate-level course (EE 569) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee. Pre-requisite: EE 264 Minimum Grade of D and EE 268 Minimum Grade of D and EE 334 Minimum Grade of D.

EE 470  Synth Active-Passive Networks  3 cr
Reliability of network functions (high-pass, band-pass, low-pass, band reject and equalizing filters); approximation techniques; sensitivity analysis; passive and active synthesis; positive and negative feedback and biquads. Computer techniques for the realization of standard filter forms (Butterworth, Chebyshev, Bessel, Sallen and Key, and other forms). Pre-requisite: EE 321 Minimum Grade of D.

EE 471  Wireless Communication  3 cr
Introduction to wireless communications propagation in mobile radio channels, large, small scale fading and multipath; diversity and diversity combining techniques and modulation techniques. This course is dually listed with an equivalent graduate level course (EE 571) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee. Pre-requisite: EE 372 Minimum Grade of D.

EE 473  Advanced Communication Systems  3 cr
Digital line coding; pulse shaping; partial response signaling; scrambling; M-ary communication; digital carrier systems and digital multiplexing. Probability; random variables; quantization error in PCM; random processes; white noise and the behavior of analog systems in the presence of noise. Information theory; compact codes and error correcting codes. This course is dually listed with an equivalent graduate level course (EE 573) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee. Pre-requisite: EE 372 Minimum Grade of D.

EE 481  Electrical Machines  3 cr
DC machines-motors and generators. Single-phase motors; unbalanced two-phase motors; servo-motors; commutator motors; stepper motors; synchros; shaded pole motors; reluctance and hysteresis motors and brushless DC motors. Dynamic circuit analysis of rotating machines. Pre-requisite: EE 381 Minimum Grade of D.

EE 482  Switch Mode Power Conversion  3 cr
Design and analysis of switch mode power converters; design of magnetic components; stability considerations; input filter interactions; performance measurements and evaluations. This course is dually listed with an equivalent graduate-level course (EE 582) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Pre-requisite: EE 334 Minimum Grade of D and EE 381 Minimum Grade of D.

EE 483  Power Systems I  3 cr
Principles of power system analysis. Synchronous machines, transformers and loads; transmission line parameters and analysis. Impedance/admittance matrix representation of power systems. Power flow analysis. Symmetrical fault studies and protective devices. Fee. Pre-requisite: EE 381 Minimum Grade of D and EE 385 Minimum Grade of D. EE 385 can be taken concurrently with this course.

EE 484  Power Systems II  3 cr
Symmetrical components and sequence networks; computer studies of transmission lines; fault studies using a computer; state estimation of power system and power system stability, Economic analysis. Fee. Pre-requisite: EE 483 Minimum Grade of D.
EE 485  Power Distrib and Utilization  3 cr
Principles and characteristics of generating stations; transformers; conversion equipment; primary and secondary distribution systems; short-circuit calculations; selection of protective devices; system grounding and over current protection; voltage control; power factor control and correction; load and cost estimating.
Pre-requisite: EE 483 Minimum Grade of D.

EE 486  Power Electronics  3 cr
Power semiconductor diodes and thyristors; commutation techniques; rectification circuits - uncontrolled and controlled; AC voltage controllers; DC chopper; pulse-width modulated inverters and resonant pulse inverters. This course is dually listed with an equivalent graduate level course (EE 586) and requires a minimum GPA of 2.75 or the instructor's permission for admission. Fee.
Pre-requisite: EE 334 Minimum Grade of D and EE 381 Minimum Grade of D.

EE 487  Switch Mode Power Conversion  3 cr
Design and analysis of switch mode power converters; design of magnetic components; stability considerations; input filter interactions; performance measurements and evaluation. This course is dually listed with an equivalent graduate level course and requires a minimum GPA of 2.75 for admission.
Pre-requisite: EE 334 Minimum Grade of D and EE 381 Minimum Grade of D.

EE 488  Illumination Engineering  3 cr
Photometric units and definitions; light sources and luminaires; interior lighting and artificial illumination design techniques; daylight lighting design; exterior lighting design and the theory of color. Optics and control of lighting.
Prerequisite: Instructor's permission.

EE 489  Renewable Energy  3 cr
Introduction to renewable energy sources. Fuel cells: classification, configuration and operation. Hydrogen: production, purification and storage. Photovoltaic cells: solar cells and operational characteristics. Wind turbines: operational characteristics. Energy from water sources: hydroelectric, wave and tidal energy. This course is dually listed with an equivalent graduate course and requires a minimum GPA 2.75 or the instructor's permission for admission.
Pre-requisite: EE 381 Minimum Grade of D.

EE 490  Special Topics  1 TO 3 cr
Topics of current electrical and computer engineering interest. This course requires permission of the department chair and a minimum GPA of 2.75 for admission.
(Prerequisites: PCS and Instructor's permission.)

EE 494  Directed Studies  1 TO 3 cr
Directed study under the guidance of a faculty advisor, of a topic from the field of electrical and/or computer engineering, not offered in a regularly scheduled course. This course requires permission of the Department Chair and a minimum GPA of 2.75 for admission. Pre-requisite: PCS. Fee.

EE 499  Honors Senior Project - H  1 TO 6 cr
Under the advice and guidance of a faculty mentor, honors student will identify and carry out a research project, relevant to the field of Electrical and Computer Engineering which will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor.
Students are required to become members of IEEE/ACM and attend two technical meetings. This course is required for Honors recognition. A minimum of 4 credit hours is required, but students may enroll for a maximum of 6 credit hours over two semesters. Prerequisites: an approved project prospectus.
Pre-requisite: EE 401 Minimum Grade of D.

EE 522  Adv Feedback Control Systems  3 cr
Sensors; encoders and D.C. motors in control systems. The performance and design of feedback control systems. System bandwidth; Nichol's Chart and the stability of control systems with time delays. State variable analysis and design. Use of MatLab for analysis and design. This course is dually listed with an equivalent 400-level Electrical/Computer Engineering course.

EE 523  Modern Control Theory  3 cr
Simulation and modeling; introduction to linear system theory; concepts of controllability and observability; specifications, structures and limitations; review of classical design methods; state feedback design methods; multivariable control; robust stability and sampled data implementation. Introduction to the use of MATLAB for design. This course is dually listed with an equivalent 400-level course (EE 423).

EE 524  Nonlinear Control Systems  3 cr
State space description; methods of linearization; isoclines; stability of nonlinear systems; Lyapunov's direct method; harmonic linearization; describing functions; dual input describing functions; Popov's method; circle criterion, computer aided analysis. This course is dually listed with an equivalent 400-level course (EE 424).
Pre-requisite: EE 523.

EE 525  Optimal Control Systems  3 cr
Static optimization; method of Lagrange multipliers; adaptive controllers; dynamic optimization; calculus of variations; the principle of optimality and dynamic programming; Pontryagin's maximum principle; quadratic optimal control.
Pre-requisite: EE 523.
EE 526  Introduction to Robotics  3 cr
Basic mathematics of robotic systems; coordinate
transformations: forward and inverse kinematics; velocity
kinematics; path planning and trajectory generation;
numerical methods; mobile robots. Fee

EE 527  Digital Control Systems  3 cr
State space and transfer function description of discrete
time systems; solution of the discrete state equation;
discrete-time model of analog plants; frequency domain
analysis; designing of discrete state-feedback regulators;
observers and tracking systems. This course is dually listed
with an equivalent 400-level course (EE 427).

EE 528  Advanced System Theory  3 cr
Review of linear spaces and operators; state variable
description of time varying and time invariant linear systems.
Controllability and observability of linear dynamical systems;
state feedback and state estimators; stability of linear
systems; arbitrary pole assignment for multivariable case.
Prerequisite: Instructor's permission.

EE 530  Nanotechnology  3 cr
Nanotechnology fundamentals and principles; quantum
wires and dots; single electron effects and coulomb
blockade; nanomagnets and spintronics; spin based
electronics (magnetic memories, magnetic field sensors);
nanofabrication; nanoelectronics (QCQ); organic
electronics (carbon fullerenes and nanotubes, polymers);
advanced characterization techniques; applications
especially those related to nanotechnology; MEMS
and microsystems (sensors); QWIP technology and its
associative nanoscience; photonic crystal; advances in
nanostructured materials. Requires instructor's permission.

EE 531  Advanced Electronic Devices  3 cr
Semiconductor electronics; semiconductor diode circuit
analysis; bipolar and field effect transistors; analog-to-digital
and digital-to-analog circuits and active filters. This course
is dually listed with an equivalent 400-level course (EE 431).
Prerequisite: Instructor's permission

EE 532  Microelectronic Devices  3 cr
Introduction to semiconductor material properties;
semiconductor diodes: structure and operation; diode
circuit applications; semiconductor heterojunctions; metal-
semiconductor junctions; bipolar transistor: structure
and operation; junction field effect transistors (JFETs);
metal oxide field effect transistors (MOSFETS); metal
semiconductor field effect transistors (MESFETs);
fabrication technology and construction of semiconductor
devices; photodetectors; light-emitting diodes; laser diodes;
solar cells; image sensors; spice based microelectronic
circuit design. This course is dually listed with equivalent
400-level course (EE 432).

EE 534  VLSI Design Systems  3 cr
Review of fabrication of microelectronic devices; introduction
to MOS technology; basic physical and electrical properties
of field effect transistors; CMOS fabrication; layout of CMOS
integrated circuits; MOSFETS; concepts of VLSI chip
design; physical design of CMOS integrated circuit.

EE 535  Electronic Materials Prop-Appl  3 cr
Schrödinger's equation, potential wells and barriers;
crystallographic geometry; Kronig-Penny model;
energy bands in crystalline solids; density of states -
Fermi statistics; intrinsic and extrinsic semiconductors;
conductivity and Hall effects; interfaces; magnetic materials;
superconducting materials; optical materials. Prerequisite:
Instructor's permission.

EE 536  Intro to Superconductivity  3 cr
Microscopic theory of superconductivity; BCS
theory; superconduction tunneling phenomena;
superconducting device; superconducting materials; High-Tc
superconductors. Prerequisite: Instructor's permission.

EE 537  Adv Plasma Process Elect Mat  3 cr
Analysis, design and application of DC, RF and microwave
plasma in microelectronic material processing; sputtering;
etching; deposition; surface modification; diagnostic and
characterization techniques. Prerequisite: Instructor's
permission.

EE 538  Magnetic Recording Media  3 cr
Magnetostatic fields; magnetization processes;
demagnetizing factors; magnetic circuits; hard disk / tape
media; inductive and MR heads; magnetic data storage
systems. Prerequisite: Instructor's permission.

EE 539  VLSI Technology - Fabrication  3 cr
Introduction to semiconductor devices; crystal growth and
wafer preparation; chemical and physical vapor deposition;
oxidation; diffusion; ion implantation; lithography; etching;
metallization; process integration of CMOS and bipolar
technologies; diagnostic techniques and measurements;
packaging; yield and reliability. This course is dually listed
with an equivalent 400-level course (EE 439).

EE 540  HDL Logic Synthesis  3 cr
Introduction to the syntax and elements of the basic VHDL
language such as entities and architectures; creating
combinational, synchronous logic and state machines using
both structural and behavioral VHDL; using hierarchy in
large designs; synthesizing and implementing designs. This
course is dually listed with an equivalent undergraduate-
level course (EE 440) and requires a minimum GPA of 2.75
or the instructor's permission for admission. Credit for both
EE 540 and EE 543 not allowed toward a degree.

EE 541  Computer Networks  3 cr
Introduction to design and analysis of computer networks.
Polling networks and ring networks. Networking
applications. This course is dually listed with an equivalent
400-level EE course.
EE 542  Adv Top Digital Design - HDLs  3 cr  Current topics of interest in digital design. State-of-the-art software tools used in digital design. Advanced topics in HDLs.

EE 543  HDL Logic Simulation  3 cr  Introduction to the syntax and elements of the basic Verilog language such as modules and ports; hierarchical modeling; gate-level modeling; dataflow modeling; behavioral modeling; switch-level modeling; tasks and functions; timing and delays; user-defined primitives; synthesizing and implementing designs. Emphasis is on the simulation and test-bench aspects. This course is dually listed with an equivalent undergraduate-level course (EE 443) and requires a minimum GPA of 2.75 or the instructor's permission. Credit for both EE 540 and EE 543 not allowed toward a degree.

EE 544  Wireless Networks  3 cr  Introduction to modern wireless networks/systems, the cellular concept, frequency reuse, interference and system capacity improvement, trunking and grade of service, multiple access techniques, wireless/wireline interworking, and ad hoc networks). This course is dually listed with an equivalent 400-level course (EE 444) and requires a minimum GPA of 2.75. Pre-requisite: EE 541.

EE 545  Optical Network  3 cr  Digital transmission using fiber optics as point-to-point link. Wavelength-division-multiplexing concepts and components, LAN, WAN, and MAN, SONET/SDH, FDDI Networks, Broadcast-and-select WDM Networks, Wavelength-routed Networks, and Performance of WDM and EDFA systems. Prerequisite: Instructor's permission. Fee. Pre-requisite: EE 456 Minimum Grade of D.


EE 548  Computer-Network Security  3 cr  Cryptography; Symmetric and asymmetric encryption; authentication and identification schemes; MACs and Digital Signatures; applications of security.

EE 552  Microwave Engineering  3 cr  Generation and transmission of high frequency electromagnetic energy-magnets, klystrons, maser, parametric amplifiers, traveling wave tubes and solid-state devices. This course is dually listed with an equivalent 400-level course (EE 452). Prerequisite: Instructor's permission.

EE 553  Antenna Theory and Design  3 cr  Radiation fundamentals; linear antennas; loop antennas; aperture antennas; reflector antennas; antenna impedance and measurements; computer-aided design of antenna systems. This course is dually listed with an undergraduate level course (EE 453).

EE 554  Digital Computer Architecture  3 cr  Computer organization; instruction set design; ALU design; control unit design; I/O and interrupt designs; memory organization; DMA; microprogramming; introduction to multi-processors; performance analysis. This course is dually listed with an undergraduate level course (EE 454).

EE 555  Optoelectronics  3 cr  Wave propagation in free-space and in wave guides; optical resonators, interaction of radiation and atomic systems; laser oscillation; solid-state lasers. He-Ne and Argon ion lasers, integrated optics including integration of emitters and detectors; optical interconnects; spatial light modulators; optoelectronic materials and devices; and applications of optoelectronics. This course is dually listed with a 400-level course (EE 455).

EE 556  Fiber Optic Communication Sys  3 cr  Review of optical principles, dielectric waveguides, signal propagation, degradations and attenuation of fibers. Fiber interconnection devices, active and passive components, optical transmitters and receivers, power budget, fiber optic communication systems. This course is dually listed with an equivalent undergraduate-level course (EE 456). Fee.

EE 557  Adv. Embedded System Design  3 cr  Architecture and software of 16-bit and 32-bit microprocessor hardware and software; interface design to memory and peripheral devices; multiprocessing. This course is dually listed with an undergraduate level course (EE 457).

EE 558  Radar Analysis  3 cr  Introduction to radar signal processing. Continuous wave and pulsed radars. Clutter and radio wave propagation. Moving target indicator, target surveillance and tracking radar systems. Side-looking, synthetic aperture, interferometric and other airborne radars. This course is dually listed with an equivalent 400-level (EE458).

EE 559  Optical Info Process-Holograph  3 cr  Parallel optical information processing in Fourier transform systems; nonlinear optical image processing in a linear optical processing; optical image equidensity and pseudocolor using techniques; wave-front reconstruction; on-axis and off-axis holography; effects of film MTF and nonlinearities; holographic memory, display and non-destructive testing; and optical computing. Prerequisite: Instructor's permission.
EE 560  Adv Computer Architecture  3 cr
Overview of software/hardware architectures of selected RISC/CISC microprocessors, advanced pipelining and instruction level parallelism, superscalar techniques, memory hierarchy design, cache coherency, introduction to multiprocessor systems and interconnection networks. Pre-requisite: EE 554 Minimum Grade of C.

EE 565  Adv Digital Signal Processing  3 cr
Review of discrete Fourier and z-transforms; review of analog filter design; canonical digital filter forms; design of IIR and FIR digital filters. Fast Fourier Transforms (FFT) and their applications; hardware implementation and quantization effects. Advanced digital filter structures and design. DSP algorithm design and implementation. Analysis of finite wordlength effects of DSP applications. Extensive use of Matlab for analysis and design. This course is dually listed with an equivalent 400-level EE course (EE 465).

EE 566  Digital Image Processing  3 cr
Review of digital image fundamentals; different image transforms; image enhancement techniques; image restoration methods; detection of discontinuities and thresholding.

EE 567  Biomedical Imaging  3 cr
Introduction to biomedical imaging, projection radiography, computer aided tomography, single photon emission computed tomography (SPECT), positron emission tomography (PET), magnetic resonance imaging (MRI and MRA), ultrasound imaging, optical imaging techniques including confocal microscopy and optical coherence tomography (OCT). Fee. Pre-requisite: EE 566 Minimum Grade of D.

EE 568  Pattern Recognition  3 cr
Introduction to pattern recognition, statistical, syntactic and neural pattern recognition; Decision procedures; Parameter estimation and supervised learning; Non-parametric techniques; Feature extraction and nonlinear mapping; Fuzzy systems in pattern recognition; Methods of testing

EE 569  Signal Integrity  3 cr
Design techniques for high-speed digital interfaces and circuit boards; signal integrity including crosstalk and ground bounce; electromagnetic aspects of high-speed digital design; frequency-domain analysis of power-system integrity; state-of-the-art buses and standards. This course is dually listed with an equivalent undergraduate-level course (EE 469).

EE 571  Wireless Communications  3 cr
The cellular concept and system design fundamentals, propagation in mobile radio channels, large scale fading; small-scale fading and multi-path statistical distributions, distributions, diversity and diversity combining techniques. This course is dually listed with an equivalent undergraduate level course (EE 471) and requires instructor's permission for admission. Fee. Pre-requisite: EE 322 Minimum Grade of D and EE 372 Minimum Grade of D.

EE 573  Advanced Communication Systems  3 cr
Digital line coding; pulse shaping; partial response signaling; scrambling; M-ary communication; digital carrier systems and digital multiplexing. Probability; random processes; white noise and the behavior of analog systems in the presence of noise. Information theory; compact codes and error correcting codes. This course is dually listed with an equivalent 400-level course (EE 473).

EE 574  Digital Communications  3 cr
Analysis and design of digital communication systems based on probability theory; signal space representation and optimum detection principles; Digital modulation techniques and their performance in additive white Gaussian noise. Pre-requisite: EE 573.

EE 575  Stochastic Processes  3 cr
Introduction to estimation theory. Markov chains - finite, countable, continuous time, optimal stopping; Martingale; renewal processes, reversible Markov chains, Brownian motion and stochastic integration.

EE 576  Optical Communications  3 cr
Light sources, detectors, fiber components and optical systems for fiber communication; free-space inter-satellite optical networks for high-speed global communication; coding problems in optical fiber data transmission; three-dimensional optical data storage for database processing; propagation losses and fiber amplifiers; and optical free-space interconnections in future computers. Prerequisite: Instructor's permission.

EE 577  Information Theory  3 cr
Self-information; entropy; mutual information and channel capacity; encoding; error detecting and correcting codes. Sampling theorem. Discrete and continuous channels. Band-limited channels.

EE 578  Error Correction Codes  3 cr
This course is designed to introduce the students to error correcting codes, their construction and properties, encoding and decoding.

EE 579  Wireless Sensor Networks  3 cr
Introduction to Wireless Sensor Networks; Network deployment; Network Topologies; Localization; Tracking; Time synchronization techniques; Wireless characteristics; Energy considerations; MAC layer protocol and sleep scheduling; Routing; Sleep-based topology control; Latest development in the field. Fee. Pre-requisite: EE 544 Minimum Grade of D.

EE 582  Switch-Mode Power Conversion  3 cr
Design and analysis of switch mode power converters - design of magnetic components; stability considerations; input filter interactions; performance, measurements and evaluation. This course is dually listed with an equivalent 400-level course (EE 482). Prerequisite: Instructor's permission.
EE 585  Advanced Power Systems  3 cr
Special topics that are not covered in traditional power systems courses, such as: Optimization techniques, computer methods, unified fault (short circuit) analysis, protection and control of power systems. Prerequisite: Instructor's permission.

EE 586  Power Electronics  3 cr
Power semiconductor diodes and thyristors; commutation techniques; rectification circuits - uncontrolled and controlled; AC voltage controllers; DC chopper; pulse-width modulated inverters and resonant pulse inverters. This course is dually listed with an equivalent undergraduate level course (EE 486).

EE 588  Power Semiconductor Drives  3 cr
Rectifier control of DC motors; chopper control of DC drives; closed-loop control of DC drives; induction motor speed control and multiquadrant control; control of induction motors by AC controllers and frequency-controlled drives; slip power control of induction motors; synchronous motor drives - brushless DC and AC motor drives. Prerequisites: Instructor's permission.

EE 589  Renewable Energy  3 cr

EE 590  Special Topics -  1 TO 3 cr
Topics of current electrical engineering interest. Prerequisite: Instructor's permission.

EE 592  Directed Independent Study  1 TO 3 cr
Directed study, under the guidance of a faculty advisor, of a topic from the field of Electrical and Computer Engineering not offered in a regularly scheduled course. Prerequisite: Instructor's permission.

EE 594  Project in Electrical Engr  1 TO 3 cr
An investigation of an original problem in electrical engineering under the guidance of the student's major professor. Prerequisites: Approval of the project prospectus by the student's advisory committee, and consent of the Director of Engineering Graduate Studies.

EE 599  Thesis  1 TO 6 cr
An investigation of an original problem in electrical and/or computer engineering under the guidance of the student's major professor. Prerequisite: Approval of the thesis prospectus by the student's Advisory Committee and the Graduate School and consent of the Director of Engineering Graduate Studies.

Elementary-Early Childhood (EEC)

EEC 430L  Student Teaching - EEC  0 cr
Observation and supervised teaching in elementary or early childhood settings with the opportunity for study and discussion of problems and issues encountered. (Co-requisite: Lecture) Prerequisite: Permission of department. Co-requisite: EEC 430

EEC 290  Special Topics -  3 cr
Guided study of selected educational tasks (e.g. curriculum revision, classroom materials development, models of learning and teaching) and teaching problems and practices for improving student achievement. Not more than 6 hours may be earned in Special Topics courses.

EEC 300  Creating Envir for Lrng/Play  3 cr
A study of environments that promote learning through play in early childhood. Emphasis on materials, activities, equipment, and effective strategies that support and encourage young children's play, learning and creativity.

EEC 332  Teaching Language Arts  3 cr
A course presenting methods of promoting meaningful language and literacy skills in early childhood and elementary school programs. This course has a required field experience.
Co-requisite: EEC 346, RED 330, RED 333
EEC 334  Lit for the Young Child  3 cr
A survey course dealing with methods of writing literary materials with children in preschool through the primary grades. It is designed to assist those who wish to become widely acquainted with books and related materials for today's young children.

EEC 335  Teaching Mathematics - W  3 cr
A course which deals with effective methods of teaching mathematics to elementary school students. Emphasis will be on developing an understanding of numbers, teaching basic operations, and using teaching aids and materials to meet the various needs of elementary age children. This course has a required field experience.
Co-requisite: EEC 336, EEC 337, RED 331
Pre-requisite: ( (MA 181 Minimum Grade of D or MA 201 Minimum Grade of D) or (MA 202 Minimum Grade of D or MA 281 Minimum Grade of D) ) and EEC 346 Minimum Grade of C and RED 330 Minimum Grade of C and EEC 332 Minimum Grade of C.
EEC 336  Teaching Social Studies  3 cr
A course using problem solving and independent investigation as means of teaching the relationship of humans to their environment. Objectives, content and procedures are discussed. This course has a required field experience.
Co-requisite: EEC 335, EEC 337, EEC 345, RED 331
Pre-requisite: EEC 346 Minimum Grade of C and RED 330 Minimum Grade of C and RED 333 Minimum Grade of C and EEC 332 Minimum Grade of C.

EEC 337  Teaching Science  3 cr
A course using discovery, inquiry and problem-solving approaches as a means of teaching science. Relationships of science to entire early childhood and elementary curriculum is discussed. This course has a required field experience.
Co-requisite: EEC 335, EEC 336, EEC 345, RED 331
Pre-requisite: EEC 346 Minimum Grade of C and RED 330 Minimum Grade of C and RED 333 Minimum Grade of C and EEC 332 Minimum Grade of C.

EEC 345  Sequence Field Experience  1 cr
Supervised practice in teaching curriculum areas in the elementary or early childhood classroom setting during the semester in which sequence courses are taken.
Co-requisite: EEC 335, EEC 336, EEC 337, RED 331
Pre-requisite: EEC 346 Minimum Grade of C and RED 330 Minimum Grade of C and RED 333 Minimum Grade of C and EEC 332 Minimum Grade of C.

EEC 346  Early Child Prog(Birth-8)-W  3 cr
This course will introduce the roles of the adult in working with children from birth through age 8. History, management and parent education techniques are presented.

EEC 348  Lang Dev in Early Childhood  3 cr
An introduction to speech and language development birth through primary grades and teaching practices that support language and literacy development. Includes discussion of cultural and developmental factors that influence language development methods appropriate for helping young children acquire language and literacy skills.

EEC 429  Opening School Lab Exp  0 TO 1 cr
Professional laboratory experiences of observation and participation for a two-week period at the opening of school. (May be taken twice.) Prerequisite: senior standing.

EEC 430  Student Teaching - EEC  9 TO 12 cr
Observation and supervised teaching in elementary or early childhood settings with the opportunity for study and discussion of problems and issues encountered. (Co-requisite: Lab) Prerequisite: Permission of department.

EEC 490  Special Topics  3 cr
Guided study of selected educational tasks (e.g. curriculum revision, classroom materials development, models of learning and teaching) and teaching problems and practices for improving student achievement.

EEC 494  Directed Studies  1 TO 3 cr
No more than 6 hours can be accepted for a Bachelor's Degree and Class B Certificate. Prerequisite: Permission of department chair.

EEC 496  Internship-  3 TO 9 cr
The internship is a supervised learning experience in an approved setting similar to that in which the student will eventually be employed. The internship provides students with an opportunity to apply theories and concepts learned during the undergraduate program. Requires candidacy and approval of department chair.

EEC 499  Senior Honors Project - H  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of elementary/early childhood study, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor.
This course is required for Honors recognition and may be repeated for up to 6 credit hours. Prerequisite: Participant in honors program and junior level status.

EEC 522  Elementary School Curriculum  3 cr
The study of curriculum with an emphasis on concepts, procedures and models particular to curriculum in the elementary school. Curriculum study includes the context of and a process of planning, developing, implementing, and evaluating the elementary school curriculum.

EEC 523  Instr Plan Elem School  3 cr
Presents an overview of factors and procedures involved in planning, developing and evaluating the elementary school instructional process.

EEC 532  Lit and Lang Dev in Elem Sch  3 cr
Designed to explore the multi-dimensional theory of language development and to provide techniques and practices for development of language ability. Through correlating these related areas, the student should grow in understanding dynamics and change in language structure and development. Opportunities for oral and written communication are emphasized.

EEC 535  Trends in Teaching Mathematics  3 cr
This course emphasizes new methods of presenting mathematical content to elementary school students. Various materials will be developed to promote thinking and discovery of mathematical concepts. Opportunities are provided for developing multi-level materials appropriate to the varied abilities and interest levels in elementary school. Pre-requisite: EEC 523 Minimum Grade of C. EEC 523 can be taken concurrently with this course.
EC 536 Issues-Innov Tch Soc Studies  3 cr
Current issues and innovations in early childhood and elementary school social studies teaching and learning are reviewed.

EC 537 Teaching Science  3 cr
Current trends and issues in early childhood and elementary school science teaching and learning are reviewed.

EC 538 Early Childhood Practicum  1 TO 9 cr
Experiences in a field-setting working with children birth through age 8 under the supervision of qualified personnel.

EC 540 Trends in Parent Education  3 cr
A study of current trends in parent education designed to promote better homescool communication and cooperation.

EC 541 Seminar Elem Education  3 cr
A seminar of topics, programs and research in the field of elementary education. This course provides a forum for discussion of contemporary educational issues and practicum experiences in the teaching field in which the quality of performance in teaching is evaluated.

EC 542 Comm Svcs Families-Children  3 cr
Study of agencies which provide services, types of services provided, and means of obtaining needed services.

EC 543 Org Patterns and Curr in ECE  3 cr
A review of organizational and curricular patterns utilized in the classroom setting for the education of young children. A study of educators and their theories concerning learning styles and developmental patterns in relation to the school setting and curriculum.

EC 544 Lang Dev in Early Child Ed  3 cr
Study of the language development of young children with an emphasis on provision of classroom environment to promote growth of language.

EC 545 Org-Adm In Early Childhood Ed  3 cr
Managing the multiple responsibilities of administrative heads of educational programs for young children.

EC 546 Research in Early Childhood Ed  3 cr
A review of research in the field of early childhood education.

EC 547 Elementary Practicum  1 TO 9 cr
Experiences in a field setting working with children in grades K-6 under the supervision of qualified personnel.

EC 548 Teaching Spelling and Writing  3 cr
Analysis of methods of teaching spelling and the mechanics of writing, included review of pertinent research in the skill areas as well as emphasis on the relationship of spelling to the development of skills in word recognition.

EC 550 Workshp Elem-Early Child Ed  3 cr
A topical workshop in which participants have experiences in creating, designing, constructing and using instructional materials and activities. No more than 6 hours can be applied toward a degree program.

EC 551 Classroom Logis - Facilitation  3 cr
To increase teacher's competencies to facilitate learning by providing a classroom atmosphere conducive to self-discipline, participation and worthwhile learning activities.

EC 552 Diag Lrng Difficulties in Math  3 cr
Analysis of diagnostic techniques for identifying children's learning difficulties in mathematics.
Pre-requisite: EEC 535 Minimum Grade of B.

EC 553 Children's Lit for Gifted  3 cr
An exploration of research related to reading behavior of gifted and high-ability children with emphasis on examining criteria for selecting and utilizing literature to promote cognitive, emotional, and social development.

EC 554 Sp Top -  1 TO 3 cr
Guided supervision in the identification and completion of educational tasks, such as curriculum revision, course and/or program design, self-study for accreditation visitation, student achievement evaluation, aesthetic experiences, consumer and career education. No more than 6 hours can be applied toward a graduate degree.

EC 555 Research Seminar  3 cr
Structured to assist graduate students in designing and implementing appropriate research for professional growth and writing of a thesis.

EC 556 Dir St and Research  1 TO 3 cr
Students explore through directed individual study research problems and issues of special interest or significance in elementary or early childhood education. No more than 3 hours of any departmental 594 courses can be applied toward a degree program. Prerequisite: Permission of department chair

Pre-requisite: (PRAXIS-Teaching Reading CB 159 or PRAXIS-Teaching Reading 159) and (PRAXIS-Read/Lang Arts Subtest 157 and PRAXIS-Mathematics Subtest 157 and PRAXIS-Social Studies Subtest 154 and PRAXIS-Science Subtest 158)
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>EEC 598</td>
<td>Internship Early Childhood Edu</td>
<td>3 TO 9 9 cr</td>
<td>The internship is a supervised learning experience in a work setting similar to that in which the educator will eventually be employed. The internship provides the student an opportunity to apply the theories and concepts learned during the graduate program of study. Prerequisite: Permission of department chair. Pre-requisite: PRAXIS-Early Child Edu 156 and PRAXIS-Teaching Reading 159 or PRAXIS-Teaching Reading CB 159</td>
</tr>
<tr>
<td>EEC 599</td>
<td>Thesis</td>
<td>1 TO 9 cr</td>
<td>A student selects a project, study, or investigation related to his area of specialization in early childhood or elementary education. The project forms a basis for the thesis. A thesis committee will provide direction during the investigation for and writing of the thesis.</td>
</tr>
<tr>
<td>EEC 601</td>
<td>Advanced Seminar -</td>
<td>3 cr</td>
<td>In depth study of various curriculum areas through research reports, problem analysis and individual evaluation of promising practices and topical issues. Each seminar participant will concentrate on a curriculum area: e.g., arithmetic, career awareness, communication, consumer education, humanities, natural sciences, social sciences, early reading and psycholinguistics.</td>
</tr>
<tr>
<td>EEC 610</td>
<td>Diag and Prescriptive Teaching</td>
<td>3 cr</td>
<td>Designed to assist teachers and school leaders in understanding the skills and techniques necessary for diagnosing and prescribing for learners in different types of teaching-learning settings.</td>
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<tr>
<td>EEC 622</td>
<td>Seminar in Curr-Inst Problems</td>
<td>3 cr</td>
<td>Critical study of curriculum and instructional problems in the elementary school. Research reviews and program design problems are emphasized.</td>
</tr>
<tr>
<td>EEC 635</td>
<td>Seminar in Mathematics Ed</td>
<td>3 cr</td>
<td>A study of current topics related to teaching mathematics in early childhood and elementary years.</td>
</tr>
<tr>
<td>EEC 690</td>
<td>Sp Top -</td>
<td>3 cr</td>
<td>Guided supervision in the identification and completion of educational tasks, such as curriculum revision, course and/ or program design, self-study for accreditation visitation, student achievement evaluation. No more than 6 hours can be applied toward a graduate degree. Prerequisite: Permission of department chair.</td>
</tr>
<tr>
<td>EEC 694</td>
<td>Dir St and Research -</td>
<td>1 TO 3 cr</td>
<td>Students explore through directed study problems and issues of special interest or significance in early childhood or elementary education. No more than 3 hours of any departmental 694 courses can be applied toward a degree program. Prerequisite: Permission of department chair.</td>
</tr>
<tr>
<td>EEC 695</td>
<td>Internship</td>
<td>3 TO 9 cr</td>
<td>The internship is a supervised learning experience in a work setting similar to that in which an educator will eventually be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate program.</td>
</tr>
<tr>
<td>EEC 699</td>
<td>Research Project</td>
<td>1 TO 3 cr</td>
<td>The research project, as the culminating experience in the Instructional Specialist Program, provides an opportunity for the candidate to synthesize and apply the various program components in a selected instructional setting. Suitable agreements are reached with the appropriate school systems by the candidate. May be taken more than one semester. Prerequisite: Permission of department chair. Pre-requisite: EEC 601 Minimum Grade of B and EEC 610 Minimum Grade of B and EEC 622 Minimum Grade of B and IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.</td>
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</table>

### Emergency Medical Services (EMS)

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>EMS 100</td>
<td>Cardiopulmonary Resuscitation</td>
<td>1 cr</td>
<td>Cardiopulmonary Resuscitation (CPR) emphasizes the scope and magnitude of cardiovascular disease causes of sudden death, and the effects of prudent heart living as a tool to reduce risk factors associated with cardiovascular disease. The skills component identifies and measures competence in one-person CPR, two person adult CPR, infant and child CPR, and management of airway obstruction. Course completion cards are issued by the American Heart Association.</td>
</tr>
<tr>
<td>EMS 104</td>
<td>First Aid/CPR</td>
<td>1 cr</td>
<td>This American Heart Association course includes the basics of First Aid and Cardiopulmonary Resuscitation (CPR) for Adults, Children and Infants. Course content includes instruction on recognition and management of medical and trauma emergencies including environmental emergencies. The skills component includes competence in one-person adult, infant and child CPR, and management of airway obstruction as well as skills associated with trauma and medical emergencies. Course completion cards are issued by the American Heart Association.</td>
</tr>
</tbody>
</table>
EMS 110  Emergency Medical Responder  3 cr
A skills approach in helping the student to intervene in any medical or traumatic emergency situation before emergency personnel arrive. Emphasis is placed on care of the airway, CPR, control of bleeding, splinting and bandaging, and overall management. Clinical rotations include emergency department and ambulance. American Heart Association Healthcare Provider CPR certification will be awarded. Successful completion of this course permits the student to sit for the National Registry exam for Emergency Medical Responder. Upon successful completion of the National Registry exam the student may apply for a license with the Alabama Department of Public Health as an Emergency Medical Responder.

EMS 112  EMT Emergency Care  6 cr
Includes all required modules of the 2009 National EMS Educational Standard Curriculum. Topics include pathophysiology, patient assessment, airway management, hemorrhage control, management of fractures, care of individuals with special needs, emergency childbirth, care of infants and children, medical emergencies, environmental emergencies, transportation of the sick and injured, operations and radio communications. Prerequisite: AHA BLS for Health Care Providers. Co-requisite: EMS 113, EMS 115

EMS 113  EMT Skills Lab  1 cr
Emergency Medical Technician Skills practicum, Designed to allow EMT students extensive practice of required psychomotor skills. Co-requisite: EMS 112, EMS 115

EMS 115  EMT Clinical Internship  1 cr
Pre-hospital care and transportation of the sick and injured using principles of basic life support, correlated with emergency department experience. Time distributed between emergency department and ambulance. Co-requisite: EMS 112, EMS 113

EMS 140  Advanced EMT  6 cr
This course includes theoretical concepts and competencies outlined in the National EMS Education Standards for Advanced EMT’s. Major topical areas include EMS operations, airway management, assessment and management of the medical and trauma patient, pharmacology for the A-EMT, public health and life span development, among others. Co-requisite: EMS 141, EMS 143 Pre-requisite: EMS 112 Minimum Grade of B and EMS 113 Minimum Grade of S and EMS 115 Minimum Grade of S and EMS 210 Minimum Grade of B. EMS 210 can be taken concurrently with this course.

EMS 141  Advanced EMT Skills Lab  1 cr
This course is designed to integrate previously learned theory on advanced pre-hospital assessment, treatment and documentation of the medical and traumatic emergency patient. The course includes psychomotor skills and competencies outlined in the DOT’s National EMS Education Standards for Advanced EMTs. Pre-requisite: (EMS 210 Minimum Grade of B or EMT 210 Minimum Grade of B and (EMS 200 Minimum Grade of B or EMT 310 Minimum Grade of B) and (EMS 140 Minimum Grade of B or EMT 321 Minimum Grade of B) and (EMS 143 Minimum Grade of S or EMT 371 Minimum Grade of S). EMS 210 and EMS 200 and EMS 140 and EMS 143 and EMT 371 can be taken concurrently with this course.

EMS 143  Advanced EMT Internship  2 cr
Supervised clinical and field experiences emphasizing patient care in the hospital and out-of-hospital environments. Time distributed between hospital emergency departments, fire rescue departments, and ambulance services, among others. Pre-requisite: (EMS 210 Minimum Grade of B or EMT 210 Minimum Grade of B and (EMS 200 Minimum Grade of B or EMT 310 Minimum Grade of B) and (EMS 140 Minimum Grade of B or EMT 321 Minimum Grade of B) and (EMS 141 Minimum Grade of S or EMT 361 Minimum Grade of S). EMS 210 and EMS 200 and EMS 140 and EMS 141 can be taken concurrently with this course.

EMS 200  Human Systems/Pathophysiology  3 cr
An overview of the human body systems and disease processes. Emphasis is placed on the functions of human systems and subsystems relative to pathophysiology. Includes concepts of pathophysiology included in the National Standard Curriculum for the Paramedic and the requirements set forth by the Alabama Department of Public Health.

EMS 210  Medical Terminology  3 cr
Medical vocabulary including prefixes, suffixes and their etymological derivation. Proper pronunciation stressed as well as logic, grammar, and spelling. Course includes an overview of human anatomy and physiology.
EMS 212  Paramedic Foundations  3 cr
This course introduces issues related to the practice of pre-hospital advanced life support as a career, with a focus on issues common to all health care professions. Content areas include: paramedic roles and responsibilities, well-being of the paramedic, illness and injury prevention, medical-legal-ethical issues, therapeutic communication, pharmacology and advance airway management. Upon course completion, student will have met the objectives as outlined in the National Standard Curriculum for the Paramedic.
Pre-requisite: (EMS 210 Minimum Grade of B or EMT 210 Minimum Grade of B) and (EMS 140 Minimum Grade of B or EMT 321 Minimum Grade of B) and (EMS 141 Minimum Grade of S or EMT 361 Minimum Grade of S) and (EMS 143 Minimum Grade of S or EMT 371 Minimum Grade of S) and (EMS 200 Minimum Grade of B or EMT 310 Minimum Grade of B) or (BMD 114 Minimum Grade of C or BLY 151 Minimum Grade of C or CLS 114 Minimum Grade of C) and (BMD 115 Minimum Grade of C or BLY 152 Minimum Grade of C or CLS 115 Minimum Grade of C) and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of S or EMT 465 Minimum Grade of S). EMS 214 and EMS 216 and EMS 217 can be taken concurrently with this course.

EMS 214  Introduction to EMS Cardiology  3 cr
Rhythm interpretation in Lead II EKG. Rapid recognition, defibrillation and/or therapeutic management of potentially lethal rhythms and myocardial infarction. Objectives include twelve lead placement and basic rhythm recognition.
Pre-requisite: (EMS 210 Minimum Grade of B or EMT 210 Minimum Grade of B) and (EMS 140 Minimum Grade of B or EMT 321 Minimum Grade of B) and (EMS 141 Minimum Grade of S or EMT 361 Minimum Grade of S) and (EMS 143 Minimum Grade of S or EMT 371 Minimum Grade of S) and (EMS 200 Minimum Grade of B or EMT 310 Minimum Grade of B) or (BMD 114 Minimum Grade of C or BLY 151 Minimum Grade of C or CLS 114 Minimum Grade of C) and (BMD 115 Minimum Grade of C or BLY 152 Minimum Grade of C or CLS 115 Minimum Grade of C) and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of S or EMT 465 Minimum Grade of S). EMS 214 and EMS 216 and EMS 217 can be taken concurrently with this course.

EMS 216  Patient Assess/Mgt & EMS Oper  3 cr
Includes history taking, physical examination, clinical decision making, communications, documentation, assessment-based management of medical and trauma patients, ambulance operations, incident command rescue, Hazmat and crime scene awareness.
Pre-requisite: (EMS 210 Minimum Grade of B or EMT 210 Minimum Grade of B) and (EMS 140 Minimum Grade of B or EMT 321 Minimum Grade of B) and (EMS 141 Minimum Grade of S or EMT 361 Minimum Grade of S) and (EMS 143 Minimum Grade of S or EMT 371 Minimum Grade of S) and (EMS 200 Minimum Grade of B or EMT 310 Minimum Grade of B) or (BMD 114 Minimum Grade of C or BLY 151 Minimum Grade of C or CLS 114 Minimum Grade of C) and (BMD 115 Minimum Grade of C or BLY 152 Minimum Grade of C or CLS 115 Minimum Grade of C) and EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of B or EMT 465 Minimum Grade of B). EMS 212 and EMS 214 and EMS 216 can be taken concurrently with this course.

EMS 217  Paramedic Clinical I  3 cr
Supervised clinical experiences emphasizing patient care in the hospital and outpatient clinical settings as outlined in the National Standard Curriculum for the Paramedic.
Pre-requisite: (EMS 210 Minimum Grade of B or EMT 210 Minimum Grade of B) and (EMS 140 Minimum Grade of B or EMT 321 Minimum Grade of B) and (EMS 141 Minimum Grade of S or EMT 361 Minimum Grade of S) and (EMS 143 Minimum Grade of S or EMT 371 Minimum Grade of S) and (EMS 200 Minimum Grade of B or EMT 310 Minimum Grade of B) or (BMD 114 Minimum Grade of C or BLY 151 Minimum Grade of C or CLS 114 Minimum Grade of C) and (BMD 115 Minimum Grade of C or BLY 152 Minimum Grade of C or CLS 115 Minimum Grade of C) and EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B). EMS 212 and EMS 214 and EMS 216 can be taken concurrently with this course.
EMS 240  EMS Resp. Special Populations  3 cr
This course relates pathophysiology and assessment findings to the formation of field impressions and treatment plans specific to special populations. Subject matter will include gynecology, obstetrics, abuse and assault, neonatology, pediatrics, special needs and the geriatric community. Upon course completion, students will have met the objectives for special populations as outlined in the National Standard Curriculum for the Paramedic.
Pre-requisite: EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of S or EMT 465 Minimum Grade of S) and (EMS 242 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 244 Minimum Grade of B or EMT 425 Minimum Grade of B) and (EMS 245 Minimum Grade of S or EMT 455 Minimum Grade of S) and (EMS 247 Minimum Grade of S or EMT 466 Minimum Grade of S). EMS 240 and EMS 242 and EMS 244 and EMS 247 can be taken concurrently with this course.

EMS 242  Paramedic Emergency Care I  3 cr
Includes pathophysiology, assessment and management of patients suffering from pulmonary and cardiovascular diseases. Additional modules may be added in accordance to standards and guidelines in the National Standard Curriculum for the Paramedic and the American Heart Association. Student will receive an ACLS provider certification upon successful completion.
Pre-requisite: EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of S or EMT 465 Minimum Grade of S) and (EMS 242 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 244 Minimum Grade of B or EMT 425 Minimum Grade of B) and (EMS 245 Minimum Grade of S or EMT 455 Minimum Grade of S) and (EMS 247 Minimum Grade of S or EMT 466 Minimum Grade of S). EMS 240 and EMS 242 and EMS 244 and EMS 247 can be taken concurrently with this course.

EMS 244  Paramedic Emergency Care II  3 cr
Includes pathophysiology, assessment and management of patients suffering from medical emergencies not included in EMS 240 and EMS 242 in accordance to the National Standard Curriculum for the Paramedic.
Pre-requisite: EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of S or EMT 465 Minimum Grade of S) and (EMS 240 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 242 Minimum Grade of B or EMT 425 Minimum Grade of B) and (EMS 245 Minimum Grade of S or EMT 455 Minimum Grade of S) and (EMS 247 Minimum Grade of S or EMT 466 Minimum Grade of S). EMS 240 and EMS 242 and EMS 244 and EMS 247 can be taken concurrently with this course.

EMS 245  Paramedic Skills Lab  1 cr
Advanced out-of-hospital practicum. Designed to integrate all previously learned theory, management concepts and behavioral objectives as outlined in the National Standard Curriculum for the Paramedic.
Pre-requisite: EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of B or EMT 465 Minimum Grade of B) and (EMS 240 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 242 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 244 Minimum Grade of B or EMT 425 Minimum Grade of B). EMS 240 and EMS 242 and EMS 244 can be taken concurrently with this course.

EMS 247  Paramedic Clinical II  2 cr
Supervised clinical experiences emphasizing patient care in the hospital and outpatient clinical settings as outlined in the National Standard Curriculum for the Paramedic.
Pre-requisite: EMS 212 Minimum Grade of B and (EMS 214 Minimum Grade of B or EMT 340 Minimum Grade of B) and (EMS 216 Minimum Grade of B or EMT 350 Minimum Grade of B) and (EMS 217 Minimum Grade of B or EMT 465 Minimum Grade of B) and (EMS 240 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 242 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 244 Minimum Grade of B or EMT 425 Minimum Grade of B) and (EMS 245 Minimum Grade of S or EMT 455 Minimum Grade of S). EMS 240 and EMS 242 and EMS 244 and EMS 245 can be taken concurrently with this course.

EMS 270  PALS  3 cr
Course based on American Heart Association's Emergency Cardiovascular Care program. Includes assessment and management of pediatric cardiovascular and respiratory emergencies. Upon successful completion, the student will receive PALS provider certification. Recommended for health care providers and health care provider students.

EMS 280  Advanced Cardiac Life Support  3 cr
Course based on American Heart Association's Emergency Cardiovascular Care program. Includes in-depth review of all cases required for a full ACLS course. Recommended for health care providers and health care provider students. Upon successful completion, the student will receive ACLS certification.
EMS 295  Paramedic Field Internship  6 cr
Supervised field experiences with an out-of-hospital advanced life support service emphasizing patient care and team leadership skills as outlined in the National Standard Curriculum for the Paramedic.
Pre-requisite: (EMS 240 Minimum Grade of B or EMT 375 Minimum Grade of B) and (EMS 242 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 244 Minimum Grade of B or EMT 425 Minimum Grade of B) and (EMS 245 Minimum Grade of B or EMT 455 Minimum Grade of B) and (EMS 247 Minimum Grade of B or EMT 466 Minimum Grade of B) and (EMS 297 Minimum Grade of B or EMT 495 Minimum Grade of B). EMS 295 can be taken concurrently with this course.

EMS 296  Special Topics in EMS  1 TO 3 cr
Selected topics in Emergency Medical Services and Emergency Response Training. Topics will vary according to needs and interest of students. Course may be repeated for credit when content varies.

EMS 297  Paramedic Comp Review/Exams  1 cr
Culmination of paramedic education. Includes practical skills lab designed to prepare the student for state licensure exams. A final practical and written exam will be administered as a final evaluation of student progress. 
Pre-requisite: (EMS 240 Minimum Grade of B or EMT 375 Minimum Grade of B) and (EMS 242 Minimum Grade of B or EMT 355 Minimum Grade of B) and (EMS 244 Minimum Grade of B or EMT 425 Minimum Grade of B) and (EMS 245 Minimum Grade of B or EMT 455 Minimum Grade of B) and (EMS 247 Minimum Grade of B or EMT 466 Minimum Grade of B) and (EMS 297 Minimum Grade of B or EMT 495 Minimum Grade of B). EMS 297 can be taken concurrently with this course.

EMS 298  Directed Studies in EMS  1 TO 3 cr
Selected topics in Emergency Medical Services and Emergency Response Training. Topics will vary according to needs and interest of students. Course may be repeated for credit when content varies.

EMS 310  Intro to EMS Systems  3 cr
This course provides students with an introduction to Emergency Medical Services (EMS) Systems. Theoretical concepts and issues will be discussed in order to provide students with a conceptual basis for understanding and analyzing EMS systems and organizations. Particular emphasis will be placed on system components, system integration and the roles and responsibilities of management and leadership in EMS organizations.

EMS 315  EMS Administration  3 cr
This course provides a general overview of management and administration functions required of EMS managers today including planning, directing, budgeting, staffing and evaluation. Particular emphasis will be placed on issues relating to human resources, EMS operations, and organizational planning.

EMS 320  EMS Law and Legal Issues-W  3 cr
This course will provide a general overview of the origins of law in the United States with particular emphasis on health laws and regulations affecting pre-hospital providers. Topics include issues relating to malpractice, litigation, consent and refusal of medical treatment, advanced directives, patient confidentiality, and expert witness preparation, among others.

EMS 325  Instructional Methods in EMS  3 cr
This course presents theoretical and practical foundations necessary for entry level EMS instructors and coordinators. Topics include instructor roles and responsibilities, learning theory, lesson plan development, test writing and validation, and program evaluation. Additional emphasis will be placed on instructional techniques for the adult learner.

EMS 340  Disaster Mgt & Event Planning  3 cr
Considerations of the theoretical and practical foundations necessary to manage incidents involving multiple casualties and multiple agencies as well as the planning and management of other large scale events. Topics include disaster planning, incident command, WMD, response issues, and scene control, among others.

EMS 350  Critical Care Paramedic  3 cr
This course provides paramedics with advanced skills and knowledge in critical care medicine. Students successfully completing this course and its subsequent internship (EMS 375) will be eligible to sit for national certification as a Critical Care Paramedic.

EMS 375  Crit Care Paramedic Internship  3 cr
An advanced clinical internship course for licensed paramedics who have successfully completed EMS 350. Internship is conducted in an approved critical care setting or facility. Successful completion of this course and its subsequent internship (EMS 375) will be eligible to sit for national certification as a Critical Care Paramedic.

EMS 401  Seminar in HP  3 cr
This course is designed to provide students with an overview of different health professions and their scope of practice and also to provide information about health administration.

EMS 410  Concepts of Prof Paramedic  6 cr
This bridge course is designed for licensed (or nationally certified) paramedics who are admitted to the Department's Paramedic to BS in EMS Track. This course provides critical updates and information related to paramedic practice and enhances the students' overall patient assessment and critical thinking skills. Focus of the course is on selected theories and concepts integrated throughout the curriculum. Additional emphasis will be on the professional roles of paramedics. Prerequisite: Paramedic to BSEMS Track.
EMS 440 Health Insurance/Managed Care 3 cr
This course provides an overview of the basic concepts and principles in the health insurance and managed care environments. Particular emphasis will be placed on issues relating to the costs, quality and access to emergency medical services. Topics include Medicare and Medicaid reimbursement, Managed Care contracting and EMS Quality Management, among others.

EMS 445 EMS Research - W 3 cr
An introduction to basic research methods and basic statistical procedures used in Emergency Medical Services research. Students will use this information in order to assist them with reading, interpreting and evaluating articles in the pre-hospital healthcare literature.

EMS 460 Issues and Trends in EMS 3 cr
Explores issues and trends at the federal, state and local levels facing EMS leaders and EMS organizations. Particular emphasis is on new and proposed programs, policies and practices which affect pre-hospital healthcare providers.

EMS 475 EMS Internship 3 cr
Structured field experience providing the student to work in an EMS administration, management or educational environment; observation of leadership processes within an EMS organization; application of EMS leadership theory and techniques.

EMS 494 Directed Studies 1 TO 3 cr
Student completes an individual project in a specific EMS area under the guidance and supervision of an EMS faculty member.

EMS 495 EMS Comp/Review Exam 1 cr
The comprehensive examination is the capstone of the Emergency Medical Services degree program. A written examination based on the program objectives of the EMS degree program will be administered as a final evaluation of the student's progress.

Engineering (EG)

EG 101 Intro to Engineering & Design 2 cr
A course for first time engineering students that assists with maximizing the student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by college life. Introduction to engineering fundamentals through reading, homework assignments, laboratory investigations, guest lecturers and group discussions on the engineering profession.
Pre-requisite: (MA 113 Minimum Grade of D or MA 172 Minimum Grade of D) or (MA 125 Minimum Grade of C or MA 132 Minimum Grade of D). MA 113 and MA 125 can be taken concurrently with this course.

Emergency Medical Training (EMT)

EMT 255 Hazardous Environment Managmnt 3 cr
Theory behind management of hazardous environment emergencies with some application of theory in a practical setting. Instruction on chemical and physical nature of hazardous materials relative to control of emergency situations involving chemical spills.

EMT 315 EMS Pharmacology I 3 cr
Introduction to pharmacology for the EMS professional. Includes drug classification, dosage calculations, routes and methods of administration, and IV access.

EMT 335 Essentials of Paramedicine 3 cr
Preparatory course for ALS EMS students. Includes airway management, EMS Systems, therapeutic communications, responsibilities, injury prevention, and legal issues.

EMT 345 EMS Pharmacology II 3 cr
Advanced course with emphasis on specific drugs within classifications, drug names, actions, indications, contraindications, side effects, precautions, dosages, clinical applications and listings of prescriptions and over-the-counter medications.

EMT 365 Advanced Trauma Management 3 cr
Includes trauma systems, mechanism of injury, management of hemorrhage, shock, burns, soft tissue, head and facial, spinal, thoracic, abdominal and musculoskeletal trauma.

EMT 440 EMS Op and Sp Considerations 3 cr
Includes special circumstances regarding geriatric patient, abuse and assault, patients with special challenges, acute interventions for the chronic care patient, ambulance operations, incident command, rescue, hazmat, and crime scene awareness.

EMT 490 Special Topics - 1 TO 3 cr
Selected topics in Emergency Medical Services and Emergency Response Training. Topics will vary according to needs and interests of students. Course may be repeated for credit when content varies.

EMT 494 Directed Studies - 1 TO 3 cr
Directed study, under the guidance of a faculty advisor, of a topic in the fields of Emergency Medical Services or Emergency Response Training. Requires the permission of department chair.
EG 201  Intro to Engr & Prob Solving  2 cr
A course for first-time transfer students that helps maximize
the student's potential to achieve academic success and
to address the transition from community college to four-
year college. Introduction to engineering fundamentals and
problem solving techniques through reading, homework
assignments, laboratory investigations, guest lecturers and
group discussions on the engineering profession.
Pre-requisite: MA 126 Minimum Grade of C.

EG 220  Electrical Circuits  3 cr
Ohm's and Kirchhoffs laws. Network theorems-
superposition, source transformation, Thevenin's and
Norton's Theorems. RLC circuits. Sinusoids and phasors
and their applications in RLC circuits. RMS values of
voltage and instantaneous power in AC circuits.
Pre-requisite: MA 126 Minimum Grade of C and PH 202
Minimum Grade of C.

EG 231  Intro to Ethics and Economics  3 cr
Introduction to ethics and the use of codes of ethics in
developing an ethical profession. Application of engineering
economic principles to engineering problems.
Pre-requisite: MA 126 Minimum Grade of C.

EG 270  Engineering Thermodynamics  3 cr
First and second law of thermodynamics with applications.
Pre-requisite: MA 126 Minimum Grade of C.

EG 283  Statics  3 cr
Use of vector algebra to analyze two and three dimensional
forces, moments, and couples. Use of free body diagrams
to analyze rigid bodies, beams, trusses, and frames in
equilibrium. Calculation of the area and mass moments of
inertia, and friction forces.
Pre-requisite: (MA 126 Minimum Grade of C and PH 201
Minimum Grade of C).

EG 284  Dynamics  3 cr
Kinematics and kinetics of particles and rigid bodies. Work/
energy and momentum methods.
Pre-requisite: EG 283 Minimum Grade of C and MA 126
Minimum Grade of C.

EG 290  Sp Top -  1 TO 5 cr
Subjects of special interest in engineering. Requires
permission of instructor.

EG 315  Mechanics of Materials  3 cr
An introduction to the mechanics of deformable bodies.
Analysis of stress and strain. Emphasis on axial, torsional
and bending loads. Deflections, deformations, and column
stability.
Pre-requisite: EG 283 Minimum Grade of C and (MA 227
Minimum Grade of C and PH 201 Minimum Grade of C).

EG 360  Fluid Mechanics  3 cr
Study of the properties of fluids including fluid statics,
kinematics; integral and differential equations of mass,
momentum and energy conservation principles; dimensional
analysis; flow in ducts; boundary layer flows; and
compressible flow.
Pre-requisite: MA 238 Minimum Grade of D and EG 284
Minimum Grade of C.

EG 390  Special Topics-  1 TO 3 cr
This course covers topics of current interest in Engineering.

EG 450  Intro to Systems Engineering  3 cr
This course will explore the history of systems engineering,
the problems that contributed to the need for systems
thinking, and the systems engineering lifecycle as defined
by ISO/IEC/IEEE 15288 Systems and Software Engineering
-- System Life Cycle Processes. This course will include a
significant reading list and a systems engineering exercise
that will run for the duration of the course.

EG 480  Prin of Eng Mgmt and Ldrshp  3 cr
An examination of skills, abilities, personality, attitudes,
values, interests and behaviors to increase self-awareness
of management and leadership competencies. Students
will also examine the concept of Professional Improvement
Process that integrates strategy, human resources and
accountability.

EG 490  Special Topics  1 TO 3 cr
This course covers topics of current interest in Engineering.

EG 494  DIS In Engineering  1 TO 3 cr
Directed study, under the guidance of a faculty advisor of a
topic from the field of Engineering not offered in a regularly
scheduled course.

EG 590  Sp Top -  1 TO 3 cr
Subjects of special interest in engineering for engineering
graduate students. Requires permission of instructor.

EG 620  Biomedical Engineering I  4 cr
Fundamental concepts of medical instrumentation,
biomedical imaging and biological systems modeling as
used in biomedical engineering. Course is cross-listed with
IDL 620. Fee.

EG 621  Biomedical Engineering II  4 cr
Fundamental concepts of transport phenomena, cellular
and tissue mechanics, and materials as used in biomedical
engineering. Course is cross-listed with IDL 621. Fee.
English (EH)

**EH 101  English Composition I**  
3 cr  
Prepares students for diverse types of college writing. Covers the writing process, general criteria used to evaluate writing, collaborative writing, and rhetoric, especially audience analysis. Some sections require an ACT Reading score of 19 or higher or an SAT Critical Reading score of 26 or higher. Grading is "A", "B", "C", and "U". Core Course.  
Pre-requisite: ACT English 19 or READING TEST SCORE 26 or SAT Critical Reading 450 or (ESL 015 Minimum Grade of C or IELTS Reading 5.5 or IBT TOEFL Reading 20 ) and (IBT TOEFL Writing 20 or IELTS Writing 5.5 or ESL 016 Minimum Grade of C).

**EH 102  English Composition II**  
3 cr  
EH 102 prepares students for college writing by focusing on argumentation, research, and the critical thinking required to argue effectively. Students must earn a C or higher in EH 102 to fulfill the University writing requirement for composition. Core course.  
Pre-requisite: ACT English 27 or SAT Critical Reading 610 or READING TEST SCORE 33 or EH 101 Minimum Grade of C or EH 010 Minimum Grade of S or University - EH101 Exempt P.

**EH 105  Honors Composition - H**  
3 cr  
This course emphasizes the types of writing that students will do in college and reflects goals of the Honors Program with advanced work in critical thinking and research. Prerequisite: students must have been accepted in the Honors Program.  
Pre-requisite: ACT English 27 or SAT Critical Reading 610 or READING TEST SCORE 33 or EH 101 Minimum Grade of C or EH 110 Minimum Grade of D or EH 190 Minimum Grade of D or EH 010 Minimum Grade of S or University - EH101 Exempt P.

**EH 200  Intro to Creative Writing**  
3 cr  
This course will introduce students to writing creatively in four major genres: poetry, fiction, nonfiction, and drama. Fundamentals of craft to be studied will include plot and character in fiction; sound and image in poetry; dialogue in drama; and form and research in creative nonfiction. Analysis of literary models, critiques of students' work, and craft discussions will aid students in creating a final portfolio.  
Pre-requisite: EH 102 Minimum Grade of C or EH 101 Minimum Grade of C or EH 105 Minimum Grade of C. EH 102 and EH 101 and EH 105 can be taken concurrently with this course.

**EH 207  Literature and Gender**  
3 cr  
A variable-topics course to study gender issues in literary texts. Can only be taken for a maximum of 3 credits.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

**EH 215  Brit Lit before 1785**  
3 cr  
This course introduces students to the cultural heritage of the British Isles by studying representatives literary works from the Middle Ages through the 18th Century.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.

**EH 216  Brit Lit after 1785**  
3 cr  
This course introduces the student to the cultural heritage of the British Isles by studying representatives literary works from the 19th Century to the present.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.

**EH 225  Am Lit before 1865**  
3 cr  
This course traces the development of American literature from its beginning through 1865 by studying the works of representative writers. Core course.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.

**EH 226  Am Lit after 1865**  
3 cr  
This course traces the development of American literature from 1865 to the present by studying the works of representative writers. Core Course.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.

**EH 235  World Lit before 1650**  
3 cr  
A survey of literature from the Ancient World, the Middle Ages, and the Renaissance, featuring selections in translation. Core Course.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.

**EH 236  World Lit after 1650**  
3 cr  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.

**EH 290  Sp Top**  
3 cr  
A variable-content course treating selected topics in literature and language. May be repeated once for a total of 6 credits when topic varies.  
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).
EH 300 Intro to Literary Study 3 cr
This course offers an introduction to the study of literature with special emphasis on critical writing. Required for 400-level literature classes.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 310 Classical Mythology 3 cr
Through the disciplines of English and Philosophy, this course will provide an introduction to myths and to the literature that recounts the myths, legends, and folktales of ancient Greece and Rome. Not only will this course offer a survey of Greek and Roman myth, but it will also look at how different writers treat the material and why their treatments vary. Cross-listed with PHL 310 and REL 310. Credit cannot be received for both EH 310 and either PHL 310 or REL 310.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 314 Medieval Literature 3 cr
This course will introduce students to major texts of medieval literature, including narrative poetry, drama, prose, and lyric poetry.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 315 Chaucer 3 cr
This course will introduce students to Chaucer's major works in the original language; no prior knowledge of Middle English is required.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 321 Renaissance Literature 3 cr
Non-dramatic literature of the English Renaissance through 1600.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 322 Shakespeare - Com and Romance 3 cr
Study of Shakespeare's comedies and romances.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 323 Shakespeare Tragedies and Hist 3 cr
Study of Shakespeare's tragedies and histories.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 324 17th Century Literature 3 cr
Non-dramatic literature 1600-1660.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 331 American Novel to 1900 3 cr
American novel from its beginning to 1900.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 332 American Nonfiction Prose 3 cr
Major American nonfiction prose.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 334 American Poetry to 1900 3 cr
American poetry from its beginning to 1900.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 340 Restoration Early 18th Lit 3 cr
Literature of the period, including such authors as Behn, Dryden, Finch, Defoe, Pope, Montagu, Swift, and Fielding.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 342 Later 18th Century Lit - W 3 cr
Literature of the period, including such authors as Gray, Boswell, Johnson, Sheridan, Radcliffe, Wollstonecraft, Blake, and Austen.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 343 18th Century British Novel 3 cr
Eighteenth-Century British novel.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 348 19th C Contl Phil-Lit Theory 3 cr
An examination of selected themes and issues in 19th century Continental Philosophy and Literary Theory. Topics may include Idealism, Romanticism, Existentialism, Marxism, Freudianism. Identical with PHL 348 and LG 348. Credit cannot be received for both EH 348 and either PHL 348 or LG 348. (For LG credit, students will be required to complete some coursework in their language of concentration.)
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 349 20th C Contl Phil-Lit Theory 3 cr
An examination of selected themes and issues in 20th Century Continental Philosophy and Literary Theory. Topics may include Phenomenology, Existentialism, Hermeneutics, Structuralism, and Post-Structuralism. Identical with PHL 349 and LG 349. Credit cannot be received for both EH 349 and either PHL 349 or LG 349. (For LG credit, students will be required to complete some coursework in their language of concentration.)
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 351 British Romanticism 3 cr
The poetry and prose of Romantic-era writers, including Wordsworth, Coleridge, Byron, Keats and Shelley.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).
EH 352 Victorian Poetry 3 cr
A study of poetry of the Victorian period.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 353 Victorian Prose 3 cr
A study of prose, emphasizing nonfiction, of the Victorian period.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 354 19th Century British Novel 3 cr
Novels of the Romantic and Victorian periods.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 357 Black Writers in America 3 cr
A survey of literature by African-American authors from the early colonial period to the present. Readings will include fiction, poetry, drama, autobiography, and polemical prose.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 360 Anglo-Am Poetry since 1900 3 cr
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 362 Am. Novel from 1900 to 1945 3 cr
A study of the American novel since 1945.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 363 American Novel since 1945 3 cr
A study of the American novel since 1945.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 364 Brit. Novel from 1900 to 1945 3 cr
A study of the British novel from 1900 to 1945.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 365 British Novel since 1945 3 cr
A study of the British novel since 1945.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 366 Contemporary Fiction 3 cr
An introduction to literary fiction of the contemporary era.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 369 Modern Short Story 3 cr
Representative modern short story writers.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 370 History of English Language 3 cr
A study of the development from Old English through Middle English to Modern English.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 371 Approaches to Eng Grammar - W 3 cr
A course designed primarily to help education majors translate between the languages of conventional grammar and the syntactical grammar relevant to the teaching of English at pre-college levels. Consideration will also be given to the rationales basic to the formation of different grammars and to methods of presenting grammatical material in a classroom situation. Non-education majors interested in a sophisticated approach to the study of grammar might also benefit from this course.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 372 Technical Writing - W 3 cr
The purpose of this course is to train students in the kinds of written reports required of practicing professionals, aiming to improve mastery of the whole process of report writing from conceptual stage through editing stage.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 373 Writing in Professions - W 3 cr
Practice in the kinds of writing done in such professions as speech pathology and audiology, nursing, teaching, criminal justice, and business. Assignments, which emphasize persuasive writing, may include position papers, correspondence, and reports.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 374 English Bible - Old Testament 3 cr
King James Version of the Bible studied with respect to literary forms, philosophical concepts, and problems of translation.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 375 Engl Bible Apocrypha New Test 3 cr
King James Version of the Bible studied with respect to literary forms, philosophical concepts, and problems of translation.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 376 Horror 3 cr
A study of the history and themes of horror from the early 19th century to the present, including representative texts, films, and scholarship.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).
EH 380  Science Fiction  3 cr  Study of the history and themes of science fiction literature and film from the end of the nineteenth century to the present.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 390  Sp Top -  3 cr  A variable-content course addressing selected topics in literature and writing. May be repeated for a total of 6 credits when course content varies.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 391  Fiction Writing  3 cr  Intensive practice in the short story with contemporary readings. Constructive, critical discussions are conducted on each composition. Emphasis is on the creation of compelling short fiction.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and EH 200 Minimum Grade of C.

EH 393  Creative Nonfiction Writing  3 cr  Intensive study of and practice in writing creative nonfiction - nonfiction that stresses personal voice and the use of literary elements. Concentrates on genres of creative nonfiction (personal or narrative essay, travel and nature writing, cultural criticism, memoir) with an emphasis on producing high-quality writing.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and EH 200 Minimum Grade of C.

EH 395  Poetry Writing  3 cr  Intensive study in different modes and forms in contemporary poetry such as fixed, open, and spoken word. Readings in contemporary poetry will serve as models for students’ creation of new poems. Workshops a primary component of the class.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and EH 200 Minimum Grade of C.

EH 401  Teaching Composition-W  3 cr  Study of theories of composition and their applications for teaching writing at the secondary school level.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 402  Rhetoric-Ancient and Modern-W  3 cr  Readings in rhetorical theory, ancient and modern, are applied in specific writing assignments which encourage students to adopt a point of view and address a specific audience.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 403  Art of the Essay - W  3 cr  Advanced expository writing. Discussion of British and American essays by such writers as Bacon, Addison, Swift, Arnold, Emerson, Chesterton, Lewis Thomas, and Didion, with applications in written assignments. Student writings are discussed in class or in conference.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 421  Literary Criticism to 1900-W  3 cr  Classical, Neo-Classical, Romantic, and Victorian literary theory. Identical to PHL 421. Credit cannot be received for both PHL 421 and EH 421.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 422  Lit Criticism Since 1900-W  3 cr  Modern and contemporary literary theory. Identical to PHL 422. Credit cannot be received for both EH 422 and PHL 422.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 461  Tudor and Stuart Drama  3 cr  A historical and generic study of plays by authors including Kyd, Marlowe, Dekker, Jonson, Middleton, Beaumont, Fletcher, and Webster.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 462  Restor-18th Century Drama - W  3 cr  A historical and generic study of plays by authors such as Wycherley, Etheridge, Behn, Dryden, Otway, Congreve, Steele, Goldsmith, and Sheridan.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 463  Drama 1890 to Present  3 cr  Twentieth-century British, American, and Continental drama, with major emphasis on the plays of Ibsen, Chekhov, Shaw, Pirandello, O’Neill, and Beckett.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 465  Middle English Literature  3 cr  Major romances and dream-visions of the late Middle Ages such as Sir Gawain and the Green Knight, Troilus and Criseyde, Sire Orfeo, Pearl, and Parliament of Birds.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 467  Milton  3 cr  Milton’s major poems, with emphasis on Paradise Lost.  Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).
<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>EH 468</td>
<td>Contemporary Black Fiction</td>
<td>3 cr</td>
<td>A close reading of selected fiction published since World War II by such authors as James Baldwin, Ralph Ellison, Alice Walker, Toni Morrison, Ernest J. Gaines, Gloria Naylor, and Julius Lester. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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</tr>
<tr>
<td>EH 470</td>
<td>Medieval Lit</td>
<td>3 cr</td>
<td>A variable content course in specific topics from medieval literature. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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</tr>
<tr>
<td>EH 471</td>
<td>Renaissance Lit</td>
<td>3 cr</td>
<td>A variable content course in specific topics from Renaissance literature. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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</tr>
<tr>
<td>EH 472</td>
<td>Shakespeare</td>
<td>3 cr</td>
<td>A variable content course in specific topics on Shakespeare. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>EH 474</td>
<td>Restoration Lit</td>
<td>3 cr</td>
<td>A variable content course in specific topics in Restoration and 18th Century literature. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>EH 475</td>
<td>19th Century Lit</td>
<td>3 cr</td>
<td>A variable content course in specific topics from 19th Century literature. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
<td></td>
</tr>
<tr>
<td>EH 476</td>
<td>Studies in 20th Century Lit</td>
<td>3 cr</td>
<td>A variable content course in specific topics from 20th-Century literature. May be repeated once for credit when course content varies for up to six credit hours. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>EH 477</td>
<td>Genre</td>
<td>3 cr</td>
<td>A variable content course in specific topics from various genres. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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</tr>
<tr>
<td>EH 478</td>
<td>Film</td>
<td>3 cr</td>
<td>A variable content course in specific topics from film studies. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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</tr>
<tr>
<td>EH 479</td>
<td>Mod/Postmodern Poetry</td>
<td>3 cr</td>
<td>A variable content course in specific topics from modern/postmodern poetry. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>EH 480</td>
<td>Gender and Lit</td>
<td>3 cr</td>
<td>A variable content course in specific topics dealing with gender and literature. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>EH 481</td>
<td>Comp and Rhetoric - W</td>
<td>3 cr</td>
<td>A variable content course in specific topics concerned with writing, rhetoric, or language studies. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>EH 482</td>
<td>Am Literature</td>
<td>3 cr</td>
<td>A variable content course in specific topics from American literature. May be repeated once for credit when course content varies for up to six credit hours. Junior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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</tr>
<tr>
<td>EH 483</td>
<td>Advanced Fiction Writing</td>
<td>3 cr</td>
<td>Innovative study in various forms of fiction for students with experience in the techniques of fiction writing. Discussion include cultural and critical context as well as foundational models. Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C and EH 200 Minimum Grade of C and EH 391 Minimum Grade of C.</td>
<td></td>
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<tr>
<td>EH 485</td>
<td>Advanced Poetry Writing</td>
<td>3 cr</td>
<td>Advanced poetry writing course that explores different styles of contemporary American poetry such as political poetry, eco-poetry, ekphrastic poetry and more. Students will create at least ten new poems and submit them for workshop. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (EH 200 Minimum Grade of C and EH 395 Minimum Grade of C).</td>
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<tr>
<td>EH 487</td>
<td>Screenwriting for Film</td>
<td>3 cr</td>
<td>Craft talks and guided workshops on how to create a feature-length screenplay. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and EH 200 Minimum Grade of C.</td>
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</tbody>
</table>
EH 488  Screenwriting for Television  3 cr
Craft talks and guided workshops on how to create a television series and write the pilot episode.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and EH 200 Minimum Grade of C.

EH 490  Special Topics  1 TO 3 cr
Selected topics in writing in literary studies. May be repeated for a total of 9 credits when course content varies.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 492  Seminar -  3 cr
Specific topics in literature. Can be taken twice for a total of 6 credits when topics vary.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 494  Directed Studies  1 TO 3 cr
Directed individual study. Requires permission of the directing professor and department chair. Course can be repeated for a total of 8 credits.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 496  Professional Studies - Intern  1 TO 2 cr
On-the-job experience related to the student's classroom work in the field of English. A maximum of two hours of credit may be earned in internships. Students consult with the English department chair regarding internship opportunities and eligibility. English majors and minors who are juniors or seniors may enroll. Pre-requisites: Permission of English department chair and the supervising professor, completion of EH 101 and EH 102 (or EH 105), 3.0 GPA, and junior or senior standing.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 497  Adv Creative Nonfiction Writ.  3 cr
Advanced study and practice of writing creative nonfiction.
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C and EH 200 Minimum Grade of C and EH 393 Minimum Grade of C.

EH 499  Senior Honors Project-H  3 TO 6 cr
With the guidance of a faculty mentor, Honors Students will identify and carry out an independent scholarly project in English. The outcome of the project will include a formal presentation and defense before the faculty and a written senior thesis. The Honors Senior Project will be evaluated and graded by three members of the faculty and chaired by the project faculty mentor. The student must complete a total of six hours of Honors Senior work, be accepted to the University Honors Program or the Department Honors Program, and have an approved project prospectus. University Honors Program participants must have completed HON 301.
Pre-requisite: HON 301 Minimum Grade of D and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

EH 501  Introduction to Crit Theory  3 cr
Required of all M.A. students in the Literature Concentration in their first year of work. Surveys current literary theory from structuralism to the present. The purpose is to introduce the conceptual lexicons and reading strategies of advanced literary analysis. Topics treated include structuralism, deconstruction, psychoanalysis, hermeneutics, Marxism, feminism, and reception theory.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 502  Graduate Writing for English  3 cr
A course preparing students for research and academic writing at the graduate level in English studies. Required of all MA students in their first year of work. Prerequisite: Admitted to Graduate Program

EH 505  Teaching College Writing  3 cr
A study of contemporary theories in writing and rhetoric, with an emphasis on their application in a college level curriculum.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 506  Composition Theory & Research  3 cr
Traces development of theoretical movements in composition, addressing research methodologies as well. Covers pedagogy but also theoretical and empirical issues such as relationship of composition to cultural criticism, ways of knowing and assessment.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 507  Topics in Rhetoric/Composition  3 cr
A variable-content course treating selected topics in Rhetoric/Composition Studies. Possible topics include histories of rhetoric, digital literacy in composition and rhetorical analyses of texts.
Pre-requisite: EH 502 Minimum Grade of C.

EH 508  Workplace Writing Contexts  3 cr
Study of theories, practices, and histories of professional writing.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 513  Studies in Chaucer  3 cr
A study of selections of Chaucer's Canterbury Tales and dream visions.
Pre-requisite: EH 502 Minimum Grade of C.

EH 514  Renaissance Poetry  3 cr
Examination of non-dramatic Renaissance poetic development, including the sonnet.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 516  Studies in Shakespeare I  3 cr
A study of Shakespeare's comedies and romances.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.
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<tr>
<td>EH 517</td>
<td>Studies in Shakespeare II</td>
<td>3 cr</td>
<td>A study of Shakespeare's histories and tragedies. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 521</td>
<td>17th Century Poetry</td>
<td>3 cr</td>
<td>A historical and formal study of the poetry of the early seventeenth century, including the works of Donne, Jonson, Herbert, Vaughan, Herrick, Marlwin, Wroth, Lanyer, and Philips. The course will emphasize the close reading of poems. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 525</td>
<td>Restor-Early 18th Century Lit</td>
<td>3 cr</td>
<td>A study of literature in the period, including such authors as Dryden, Rochester, Behn, Congreve, Defoe, Pope, Swift, and Gay. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 526</td>
<td>The 18th Century Novel</td>
<td>3 cr</td>
<td>A study of prose fiction narratives from the Restoration and eighteenth century by such authors as Behn, Defoe, Richardson, Fielding, Smollett, Stern, and Burney, with emphasis on the establishment of the novel as a respected genre. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 527</td>
<td>The Age of Sensibility</td>
<td>3 cr</td>
<td>A study of several late eighteenth-century literary figures, such as Sterne, Johnson, Boswell, Goldsmith, Sheridan, Wollstonecraft, Radcliffe, and Blake. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 532</td>
<td>Early Romantics</td>
<td>3 cr</td>
<td>A study of early Romantic poetry and prose, with emphasis on the poetry of William Wordsworth and S.T. Coleridge. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 534</td>
<td>Late Romantics</td>
<td>3 cr</td>
<td>A study of late romantic poetry and prose, with emphasis on the poetry of Lord Byron, Percy Shelley, and John Keats. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 536</td>
<td>Victorian and Edwardian Poetry</td>
<td>3 cr</td>
<td>A study of poetry of the Victorian and Edwardian periods.</td>
</tr>
<tr>
<td>EH 538</td>
<td>Victorian and Edwardian Prose</td>
<td>3 cr</td>
<td>A study of novels and short fiction of the Victorian and Edwardian periods. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 543</td>
<td>American Romanticism</td>
<td>3 cr</td>
<td>A study of writers of the American Romantic Movement, such as Irving, Emerson, Thoreau, Douglass, Whitman, and Dickinson, focusing primarily on nonfiction prose and poetry. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 544</td>
<td>Antebellum American Fiction</td>
<td>3 cr</td>
<td>Examines the emergence and development of American fiction before the Civil War, focusing on the tale and the novel, and including such figures as Cooper, Hawthorne, Poe, Melville, and Stowe. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 545</td>
<td>American Realism</td>
<td>3 cr</td>
<td>A study of writers of the American Realist Movement, such as Twain, James, Crane, Dreiser, Chopin, Cheitnutt, and Jewett. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 547</td>
<td>Southern Renaissance</td>
<td>3 cr</td>
<td>A study of several representative figures from twentieth century Southern literature, such as Faulkner, Warren, Tate, Ransom, O’Conner, McCullers, Dickey, Hurston, Wright, and Percy. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 562</td>
<td>20th Century Poetic Revolution</td>
<td>3 cr</td>
<td>A study of the key figures in the shaping of modern poetry - Yeats, Eliot, Pound, Stevens, and Frost. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 570</td>
<td>Studies in Medieval Literature</td>
<td>3 cr</td>
<td>Theme-based study of Medieval texts; possible topics include late medieval chivalry, medieval sexualities, Arthurian tradition. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 571</td>
<td>Modern British Fiction</td>
<td>3 cr</td>
<td>Examination of selected works of such authors as Conrad, D.H. Lawrence, Woolf, Forster, Joyce, Greene, and Lessing. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 572</td>
<td>Modern American Fiction</td>
<td>3 cr</td>
<td>Examination of selected works of such authors as Anderson, Dickey, Faulkner, Fitzgerald, and Hemingway. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>EH 573</td>
<td>Contemporary Fiction</td>
<td>3 cr</td>
<td>Examines significant trends in contemporary literary fiction. Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.</td>
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</table>

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2019-20 GRADUATE/UNDERGRADUATE BULLETIN
EH 574 Folklore and Ways of Listening 3 cr
This course focuses on the collection of folklore and expressive culture, providing a contemporary glimpse at collective memory. Students learn ethnographic fieldwork methods, oral history interviewing techniques, transcription, and the evaluation of oral evidence.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 577 Studies in Genre - 3 cr
Seminar in specific topics from various genres. May be repeated once for credit when content varies.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 583 Grad Fiction Writing Wksp I 3 cr
Special individual instruction in fiction writing. This course requires special permission.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 584 Grad Fiction Writing Wksp II 3 cr
Special individual instruction in fiction writing. This course requires special permission.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 585 Grad Poetry Writing Wksp I 3 cr
Special individual instruction in poetry writing. This course requires special permission.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 586 Grad Poetry Writing Wksp II 3 cr
Special individual instruction in poetry writing. This course requires special permission.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 590 Special Topics - 3 cr
A graduate seminar designed to allow close study of selected literary topics or figures. May be repeated twice for credit when the subject offerings are from different literary areas.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 591 Topics in Creative Writing 3 cr
Selected topics in creative writing. May be repeated for a total of 6 credits when the course content varies.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 592 Seminar - 3 cr
A specific subject in American or British literature to be assigned prior to each semester. May be taken once for credit when the subject offerings are from different literary areas.
Pre-requisite: EH 502 Minimum Grade of C.

EH 594 Dir St - 1 TO 8 cr
Directed individual study on a topic not covered by an existing course. Prerequisite: Prior permission of the directing professor and the department chair. May be taken for a total of 8 credits.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 598 Literature Capstone 3 cr
The literature Capstone is a directed study class required for students completing the Literature Concentration in their last semester of coursework. Working with a mentor, students create a research portfolio and give a departmental presentation.
Pre-requisite: EH 502 Minimum Grade of B. EH 502 can be taken concurrently with this course.

EH 599 Thesis - 0 TO 6 cr
One to six credits per semester with a maximum of six hours of credit. Pre-requisite: Admitted to the Graduate Program.

English Language Center (ELC)

ELC 020 Foundations Composition 0 cr
This novice course is designed to introduce students to English spelling conventions and basic sentence structure.

ELC 021 Composition I 0 cr
This beginning course is the first of a five-level sequence of courses designed to improve student competencies in composition. After mastering simple sentence construction and composing sentences on a variety of topics, students will learn to organize and develop basic paragraphs of roughly eight sentences. This course corresponds with Common European Frame of Reference level A1.
Pre-requisite: ELC 020 Minimum Grade of C or Cambridge MI Lang Assessment 030.

ELC 022 Composition II 0 cr
This high beginner course is the second of a five-level sequence of courses designed to improve student competencies in composition. Students will go beyond the minimal 8-sentence basic paragraph taught at the end of Level 1 to writing more substantive and sophisticated paragraphs. This course corresponds with Common European Frame of Reference level A2.
Pre-requisite: Cambridge MI Lang Assessment 031 or ELC 021 Minimum Grade of C.
ELC 023  Composition III  0 cr
This low intermediate course is the third of a five-level sequence of courses designed to improve student competencies in composition. Level 3 begins as a review of the paragraph and then makes the transition to multi-paragraph compositions which are in effect simple essays. This course corresponds with Common European Frame of Reference level B1.
Pre-requisite: Cambridge M1 Lang Assesment 039 or ELC 022 Minimum Grade of C.

ELC 024  Composition IV  0 cr
This high intermediate course is the fourth level of a five-level sequence of courses designed to improve student competencies in expository composition. In Level 4, students will go beyond writing the rhetorically looser multi-paragraph compositions encountered in Level 3 and begin to write formal but basic essays of four or five paragraphs. This course corresponds with Common European Frame of Reference level B2.
Pre-requisite: Cambridge M1 Lang Assesment 053 or ELC 023 Minimum Grade of C.

ELC 025  Composition V  0 cr
This advanced course is the fifth level of a five-level sequence of courses designed to improve student competencies in expository composition. Students in Level 5 are being prepared for English 101 and will go beyond writing the basic five-paragraph essay of Level 4 to composing more formal and complex five-paragraph essays in various rhetorical patterns. The class will also give students a foundation in research and documentation methodologies. This course corresponds with Common European Frame of Reference level C1.
Pre-requisite: Cambridge M1 Lang Assesment 061 or ELC 024 Minimum Grade of C.

ELC 030  Foundations Grammar  0 cr
This novice course is designed to introduce students with very limited English to the basics of English grammar and syntax, dealing with a fundamental knowledge of the parts of speech and verb forms needed to form simple sentences.

ELC 031  Grammar I  0 cr
This beginning course is the first of a five-level sequence of courses designed to improve student competencies in grammar and syntax. The focus will be on present tense statements and questions. This course corresponds with Common European Frame of Reference level A1.
Pre-requisite: Cambridge M1 Lang Assesment 030 or ELC 030 Minimum Grade of C.

ELC 032  Grammar II  0 cr
This high beginner course is the second of a five-level sequence of courses designed to improve student competencies in grammer and syntax. Students will learn the verb forms needed to talk about the past, present, and future. They will also learn to form complex sentences using dependent clauses. This course corresponds with Common European Frame of Reference level A2.
Pre-requisite: Cambridge M1 Lang Assesment 031 or ELC 031 Minimum Grade of C.

ELC 033  Grammar III  0 cr
This low intermediate course is the third of a five-level sequence of courses designed to improve student competencies in grammar and syntax. The course focuses on verb tenses (present, past, and future) in simple, progressive, and perfect forms. This course corresponds with Common European Frame of Reference level B1.
Pre-requisite: Cambridge M1 Lang Assesment 053 or ELC 032 Minimum Grade of C.

ELC 034  Grammar IV  0 cr
This high intermediate course is the fourth of a five-level sequence of courses designed to improve student competencies in grammar and syntax. In this class, students will continue to learn formal grammatical structures that are encountered in academic reading. Students will begin forming verbs in the passive voice, as well as using models to express wishes and suggestions. This course corresponds with Common European Frame of Reference level B2.
Pre-requisite: Cambridge M1 Lang Assesment 053 or ELC 033 Minimum Grade of C.

ELC 035  Grammar V  0 cr
This advanced course is the fifth of a five-level sequence of courses designed to improve student competencies in grammar and syntax. This course will prepare students for English 101 and expose students to conditionals, the use of infinitives vs. gerunds, and all types of phrases and clauses. This course corresponds with Common European Frame of Reference level C1.
Pre-requisite: Cambridge M1 Lang Assesment 053 or ELC 034 Minimum Grade of C.

ELC 040  Foundations Oral Skills  0 cr
This novice course is designed to expose students to speaking and listening skills needed for success in everyday life. The course will focus on pronunciation and basic vocabulary development through the use of conversations and dialogues.
ELC 041 Oral Skills I 0 cr
This beginning course is the first of a five-level sequence of courses designed to develop speaking and listening skills needed for success in everyday life. The course will focus on improving fluency, comprehension, pronunciation and basic vocabulary development through the use of conversations and dialogues. This course corresponds with Common European Frame of Reference Level A1.
Pre-requisite: Cambridge MI Lang Assesment 030 or ELC 040 Minimum Grade of C.

ELC 042 Oral Skills II 0 cr
This high beginner course is the second of a five-level sequence of courses designed to develop speaking and listening skills needed for success in everyday life. The course will focus on improving fluency, comprehension, pronunciation, and basic vocabulary development through the use of conversations and dialogues. This course corresponds with Common European Frame of Reference Level B1.
Pre-requisite: Cambridge MI Lang Assesment 031 or ELC 041 Minimum Grade of C.

ELC 043 Oral Skills III 0 cr
This low intermediate course is the third of a five-level sequence of courses designed to develop speaking and listening skills needed for success in everyday life. The course will focus on improving fluency, comprehension, pronunciation, and academic vocabulary through the use of lectures, academic discussions, conversations, and short presentations. This course corresponds with Common European Frame of Reference Level B2.
Pre-requisite: Cambridge MI Lang Assesment 039 or ELC 042 Minimum Grade of C.

ELC 044 Oral Skills IV 0 cr
This high intermediate course is the fourth of a five-level sequence of courses designed to develop speaking and listening skills needed for success in academic work. The course will focus on improving fluency, comprehension, pronunciation, and academic vocabulary through the use of lectures, academic discussions, and presentations. Note-taking skills will also be developed. This course corresponds with Common European Frame of Reference Level C1.
Pre-requisite: Cambridge MI Lang Assesment 053 or ELC 043 Minimum Grade of C.

ELC 045 Oral Skills V 0 cr
This advanced course is the fifth of a five-level sequence of courses designed to develop speaking and listening skills needed for success in academic work. The course will focus on improving fluency, comprehension, pronunciation, and academic vocabulary through the use of lectures, academic discussions, and presentations. Note-taking skills will also be developed. This course corresponds with Common European Frame of Reference Level C1.
Pre-requisite: Cambridge MI Lang Assesment 061 or ELC 044 Minimum Grade of C. ELC 044 can be taken concurrently with this course.

ELC 050 Foundations Reading 0 cr
ELC 051 Reading I 0 cr
This beginning course is the first level of a five-level sequence of courses designed to improve student competencies in reading comprehension. Students will read texts of 200-300 words, acquire basic reading skills and expand their basic vocabulary. This course corresponds with Common European Frame of Reference Level A1.
Pre-requisite: Cambridge MI Lang Assesment 030 or ELC 050 Minimum Grade of C.

ELC 052 Reading II 0 cr
This high beginner course is the second level of a five-level sequence of courses designed to improve student competencies in reading comprehension and vocabulary acquisition. Students will read and understand straightforward texts of multiple paragraphs (300-400 words) and acquire general reading and vocabulary skills needed for comprehension. Students will practice the reading skills of previewing, skimming, scanning, dictionary usage, and guessing meanings of unfamiliar vocabulary. This course corresponds with Common European Frame of Reference Level B1.
Pre-requisite: Cambridge MI Lang Assesment 031 or ELC 051 Minimum Grade of C.

ELC 053 Reading III 0 cr
This low intermediate course is the third level of a five-level sequence of courses designed to improve student competencies in reading comprehension and vocabulary acquisition. Students will read texts and acquire general reading and vocabulary skills needed to refine their understanding of increasingly difficult texts. Focus of vocabulary will increasing shift from the General Service List corpus to the Academic Word List. This course corresponds with Common European Frame of Reference Level B2.
Pre-requisite: Cambridge MI Lang Assesment 039 or ELC 052 Minimum Grade of C.

ELC 054 Reading IV 0 cr
Pre-requisite: Cambridge MI Lang Assesment 053 or ELC 053 Minimum Grade of C.

ELC 055 Reading V 0 cr
This advanced course is the fifth level of a level sequence of course designed to improve student competencies in reading comprehension. Students will read and understand unadapted academic literature of multiple pages (1,000-1,200 words) from a variety of fields and acquire general reading and vocabulary skills needed for comprehension at that level. Vocabulary will be derived almost exclusively from the Academic Word List. Students successfully completing Level 5 should be prepared for the kinds of reading that they will encounter in the University. This course corresponds with Common European Frame of Reference level C1.
Pre-requisite: Cambridge MI Lang Assesment 061 or ELC 054 Minimum Grade of C.
ELC 090  ELC Directed Study  0 cr
Topics of special interest to the student may be pursued on a tutorial basis. Arrangements must be made prior to registration. Permission of the Director is required. This course will be equivalent to a one credit course, with twelve hours of direct instruction.

**English Language Teaching (ELT)**

ELT 325  Survey of ESL  3 cr
A comprehensive survey of current research, methodology and materials in the field of English as a Second Language and historical, philosophical, political, legal, social and educational issues that have contributed to policy regarding public school services for language minority students.

ELT 330  Methods and Materials for ESL  3 cr
Techniques of teaching English as a second language will be introduced and applications explored. Acquaints students with methodology and materials, with instruction on the preparation of audio and visual teaching aids, lesson plans and the use of educational technology, behavioral objectives, state ESOL objectives and teaching strategies for English learners in the ESL or mainstream classroom. ELT 525 is a recommended pre-requisite or co-requisite course, but is not a requirement.

ELT 345  Cross-Cultural Understanding  3 cr
Investigates the roles of language and culture in education. Addresses the social processes involved in the second language acquisition, including developmental influences, influences of home language and culture, cultural variation, home vs. school cultural differences, and working with parents/family of ELL students.

ELT 358  Cross-Cultural Understanding  3 cr
This course provides knowledge of linguistics including English syntax, semantics, pragmatics, morphology, phonemics and phonology as applied to teaching English Language Learners. Students will review theories in first and second language acquisition. Students will apply linguistic theory, issues in sociolinguistics, psycholinguistics and neurolinguistics to teach English to ELLs, with emphasis on pronunciation, intonation and structural analysis of English and contrastive analysis of English and non-English linguistic systems.

ELT 525  Found Tchg Eng as Sec Lang  3 cr
A comprehensive survey of current research, methodology and materials in the field of English as a Second Language and historical, philosophical, legal, social, and educational issues that have contributed to policy regarding public school services for language minority populations.

ELT 530  Methods and Materials Tch ESL  3 cr
Techniques of teaching English as a second language will be introduced and applications explored. Acquaints students with methodology and materials, with instruction on the preparation of audio and visual teaching aids, lesson plans, and the use of educational technology, behavioral objectives, state ESOL objectives, and teaching strategies for the ELL student in the ESL or mainstream classroom. Course restricted to majors in ESOL education.

ELT 545  Cross-Cultural Understand Tchr  3 cr
Investigates the roles of language and culture in education. Addresses the social processes involved in the second language acquisition, including developmental influences, influences of home language and culture, cultural variation, home vs. school cultural differences, and working with parents/family of ELL students.

ELT 553  LA Assess Eval of ELL Students  3 cr
Selection, administration, and interpretation of measurement instruments. Includes entry and placement procedures, language proficiency/achievement testing, linguistic and cultural aspects of intelligence testing, multiple intelligence assessment, ELL student assessment in the mainstream classroom, and application of testing to instruction. Course restricted to majors in ESOL education.

ELT 558  Applied Ling for Teach of ELL  3 cr
This course provides knowledge of linguistics including English syntax, semantics, pragmatics, morphology, phonemics, and phonology as applied to teaching English Language Learners. Students will review theories in first and second language acquisition. Students will apply linguistics theory, issues in sociolinguistics, psycholinguistics, and neurolinguistics, to teach English to ELLs with emphasis on pronunciation, intonation, and structural analysis of English and contrastive analysis of English and non-English linguistic systems. Course restricted to majors in ESOL education.

ELT 590  Spec Top-  1 TO 3 cr
Current topics of special concern to ESOL Educators. A different topic will be covered each time the course is offered. Not more than six semester hours may be applied toward a degree program.

ELT 594  Directed Study and Research  1 TO 3 cr
Students explore through directed study problems and issues of special interest or significance in ESOL Education. Not more than three semester hours may be applied toward a degree program.
ELT 595  ESOL Internship            3 OR 6 cr
Three hundred hours of supervised on-the-job experience in teaching English to speakers of other languages (ESOL) in P-12 settings. Interns are engaged in the full scope of teaching activities including planning, delivering lessons, evaluating students, and conducting managerial tasks related to teaching English as a Second Language. Teaching experience will be accompanied by scheduled observations and discussions to analyze and evaluate each student's internship experience. Course restricted to majors in ESOL education.
Pre-requisite: ELT 525 Minimum Grade of C and ELT 530 Minimum Grade of B and ELT 545 Minimum Grade of C and ELT 553 Minimum Grade of C and ELT 558 Minimum Grade of C.

ESL 004  Intermediate ESL Structure  3 cr
An intermediate-level study of syntax and grammar.

ESL 005  Intermediate ESL Read-Vocabulary  3 cr
Emphasis on developing reading speed, comprehension and vocabulary by reading a variety of intermediate-level texts.

ESL 006  Intermediate ESL Composition  3 cr
Concentration on sentence structure and development of the paragraph.

ESL 008  Intermediate ESL Oral Skills  3 cr
Concentration on listening, comprehension, and speaking fluency.

ESL 014  Advanced ESL Structure  3 cr
An in-depth study of syntax and grammar.

ESL 015  Advanced ESL Read-Vocabulary  3 cr
Emphasis on developing speed and comprehension in reading a variety of texts.

ESL 016  Advanced ESL Composition  3 cr
Designed to give a foundation in composition and to serve as a preparatory course for English 101. It consists of three areas of concentration: sentence structure, paragraph organization, and essay organization and development.

ESL 017  English for Academic Study  3 cr
Emphases are on oral presentations with Power Point, lecture comprehension, note-taking, and library research skills.

ESL 018  Advanced ESL Oral Skills  3 cr
Emphasis is placed on communication, both oral and aural, in a variety of situations. Designed to enhance fluency in listening and speaking.

ESL 020  TOEFL Preparation  3 cr
A preparatory class for the computer-based Test of English as a Foreign Language. Students practice with exercises and tests for the four sections of the TOEFL: Listening, Listening and Structure, Reading, and Writing.

ESL 021  ESL American Short Story  3 cr
Students are familiarized with great American authors and their works of fiction in written and dramatized forms. Listening skills are developed through video presentations, writing skills through book reports, reading skills through analysis of texts, and oral skills through oral reports.

ESL 022  ESL U S Culture  3 cr
Students concentrate on the difficulties inherent in cross-cultural encounters, adjustment strategies, and information about cultural adjustment.

ESL 023  ESL Current Events  3 cr
The course is designed to stimulate students' language development through discussion, debate and readings on topics of current international interest.

ESL 024  ESL Basic Word Skills  3 cr
Emphasis is on word building through a study of roots, prefixes, and suffixes. Academic and reading vocabulary is acquired. Dictionary skills are also emphasized.

ESL 025  English on the Internet  3 cr
Students improve a number of English skills by exploring the numerous ESL web sites for TOEFL preparation, pronunciation grammar, vocabulary acquisition, slang, humor and many other areas. Writing is practiced via email, and students create their own class web page.

ESL 026  The English Verb  3 cr
An intensive review of the English verb system, including tense, voice and aspect. Ample examples, plus written and oral exercises and activities, are designed to make students more secure in their usage.

ESL 027  Practical Vocabulary-Idioms  3 cr
Students rapidly extend their vocabulary through intensive study of high-frequency words arranged thematically, such as by profession or in everyday situations. Groups of special expressions linked to certain verbs, slang expressions, and idioms are also taught.

ESL 028  Beginning English  3 cr
An introduction to the language for people who know little or no English. The goal is to achieve a basic proficiency in understanding, speaking, reading and writing English.

ESL 029  Business English  3 cr
The focus is primarily on acquisition of English business vocabulary through an examination of American business procedures and practices. Students also practice composing resumes, memos, reports, business letters and other business writing.
ESL 030  GRE Prep for Internationals  3 cr
A preparatory class for the verbal and analytical writing sections of the GRE for non-native speakers of English seeking admission to a U.S. graduate school. The course includes vocabulary building, analytical reading skills, practice with exercises and tests, as well as online work in the ESL computer lab. The quantitative section of the GRE is not covered in this course.

Environmental Toxicology  (EXT)

EXT 515  Environmental Toxicology  3 cr
Introduction to the scientific and technical principles of toxicological processes in the context of the ecosystem. Students will understand both the types of major environmental toxicants and how to properly evaluate their toxicity and factors that influence toxicity. Students will recognize and coherently formulate risk assessment and by using the tools and techniques acquired, develop and communicate proposals for remedy.

EXT 583  Entrepreneurship in Science  3 cr
This course will blend a variety of subjects from technical writing to patent law to laboratory development in an effort to provide a solid base for scientists to understand the development of technology. The course will provide a mechanism for scientists to transition technology from bench top to commercialization by providing information regarding financial resources coupled with research and laboratory development.

EXT 594  Directed Studies  1 TO 3 cr
Students pursue a research project under the direction of a graduate faculty member. The course requires special permission from the program director, to make sure that the study is in line with the curriculum that the student is pursuing.

EXT 599  Research Thesis  1 TO 6 cr
Research project directed by a member of the graduate faculty. Prerequisite: Approval of research prospectus by the graduate committee.

Finance (FIN)

FIN 300  Personal Finance  3 cr
General principles and techniques of finance as applied to personal business transactions and the management of personal funds. Finance majors may not count this course as a finance elective.

FIN 305  Introduction to Finance  3 cr
A survey course covering corporate financial management. Basic concepts such as interest rates, time value of money, cost of capital, and risk are discussed and applied to stock, bond, and long-term investment valuation. Guidelines are developed for corporate financial decision-making in such areas as working capital management and capital structure policy, but with emphasis on short-term financial management and financial planning. The impact of ethical considerations and global financial markets are discussed. This course if for non-business and non-economics majors only.
Pre-requisite: (ACC 212 Minimum Grade of D or BMS 212 Minimum Grade of D) and (ECO 212 Minimum Grade of D or ECO 215 Minimum Grade of D) and (BUS 245 Minimum Grade of D or BMS 245 Minimum Grade of D or BMS 250 Minimum Grade of D or ST 175 Minimum Grade of D or ST 210 Minimum Grade of D).

FIN 315  Business Finance  3 cr
A survey course covering corporate financial management. Basic concepts such as interest rates, time value of money, cost of capital, and risk are discussed and applied to stock, bond and long-term investment valuation. Guidelines are developed for corporate, financial decision making in the areas of capital structure policy, dividend policy, long-term financing, corporate control, and working capital management. The impact of ethical considerations and global financial markets are discussed.
Pre-requisite: (ECO 215 Minimum Grade of D and ACC 211 Minimum Grade of D and MA 120 Minimum Grade of D or MA 121 Minimum Grade of D or MA 125 Minimum Grade of D or MA 126 Minimum Grade of D or MA 131 Minimum Grade of D or MA 287 Minimum Grade of D) and (BUS 245 Minimum Grade of D or BMS 245 Minimum Grade of D or BMS 250 Minimum Grade of D or ST 175 Minimum Grade of D or ST 210 Minimum Grade of D).

FIN 332  Multinational Finance  3 cr
Analysis of financial management of multinational firms. Introduces the environment of international capital and foreign exchange markets and examines the effects of international business environment on risk, capital budgeting, working capital management, and capital structure decisions of the firm.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 343  Money Mkts and Fin Instit  3 cr
An examination of the major financial institutions operating in our economy, and the environment in which they operate. In light of the changing environment of the financial institutions area, the changing roles of the various financial markets, major legislation, and the regulatory agencies are also studied in this course. Credit for both FIN 343 and ECO 340 is not allowed.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D. FIN 315 and FIN 341 can be taken concurrently with this course.
FIN 344  Real Estate  3 cr
Introduction to the tools used to make intelligent decisions regarding real estate as a wealth-building asset. Topics include legal rights, valuation, financial analysis, contracts, and brokerage with practical applications. Emphasis is given to local supply and demand conditions and property location and their impact on typical consumer decisions.

FIN 345  Principles of Insurance  3 cr
Examines risks facing the individual and business organizations and applications of public and private insurance to reduce or eliminate such risks. This is a survey course involving all classes of insurance.

FIN 346  Alabama Real Estate Law & Reg  1 cr
Course required for students planning to take the Alabama Real Estate License Examination. Topics include current Alabama Real Estate License Law, Administrative Rules and regulations, Consumer Guides, State Court Cases and relevant readings in Real Estate Risk Management. Requires Consent of Instructor.
Pre-requisite: FIN 344 Minimum Grade of D or BMS 341 Minimum Grade of D. FIN 344 can be taken concurrently with this course.

FIN 350  Fin Stmt Analysis & Corp Strat  3 cr
In-depth coverage of the principles and practices of effective analysis of the financial statements of firms for the purpose of understanding (1) the economic and financial characteristics and current conditions of the firm, (2) particular strategies the firm may select with which to compete, and (3) the accounting principles and procedures underlying the financial statements. The course integrates concepts from accounting, economics, finance and management.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 370  Short-Term Financial Management  3 cr
In-depth coverage of liquidity, management of working capital, corporate cash management, short term investment, financing and forecasting.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 410  Intermediate Business Finance  3 cr
In-depth coverage of financial planning and management, including cost of capital, capital budgeting, valuation and other topics.
Pre-requisite: (FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D) and (BUS 255 Minimum Grade of D or ST 275 Minimum Grade of D or BMS 250 Minimum Grade of D or BMS 255 Minimum Grade of D).

FIN 411  Advanced Business Finance - W  3 cr
Actual and simulated cases in finance from business and industry; includes businesses of all sizes.
Pre-requisite: FIN 350 Minimum Grade of D and FIN 410 Minimum Grade of D or FIN 441 Minimum Grade of D.

FIN 420  Investments  3 cr
Survey of the characteristics of investment alternatives and the investment environment, including market operations and regulations, sources and uses of information, and an introduction to capital market theory.
Pre-requisite: (FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D) and (BUS 245 Minimum Grade of D or ST 175 Minimum Grade of D or ST 210 Minimum Grade of D or BMS 245 Minimum Grade of D or BMS 250 Minimum Grade of D).

FIN 421  Sec Analy-Portfolio Mgt  3 cr
The development of the theory and practice of security analysis and portfolio management. Security analysis involves the fundamental determination of security values through economic, industry, and firm analysis. Portfolio management addresses asset selection and allocation for the construction and maintenance of portfolios that meet specific investment objectives in a risk-return context.
Pre-requisite: FIN 420 Minimum Grade of D or FIN 441 Minimum Grade of D.

FIN 425  Student Managed Invest Fund I  3 cr
This is the first in a sequence of two courses whereby students manage a real portfolio of securities. The selected students research the prospective investments, generate reports, and make decisions to buy or sell the securities. Administrative responsibilities are assigned and analyst teams are formed. Students accepted into this course must enroll in FIN 426 (Student Managed Investment Fund II) the following term unless otherwise disqualified. Requires Department Chair permission.
Pre-requisite: FIN 420 Minimum Grade of D.

FIN 426  Student Managed Invest Fund II  3 cr
This is the second in a sequence of two courses whereby students manage a real portfolio of securities. The selected students research the prospective investments, generate reports, and make decisions to buy or sell the securities. Administrative responsibilities are assigned and analyst teams are formed. Students build on and add depth to skills and knowledge acquired in FIN 425. Requires Department Chair permission.
Pre-requisite: FIN 425 Minimum Grade of D.

FIN 430  Derivative Securities  3 cr
Covers principles of Options and Futures contracts and their economic functions. Options: basic strategies; combinations and spreads; pricing; and the various types of contracts. Futures: fundamentals of the market; contract specifications and their uses. Program trading and portfolio insurance.
Pre-requisite: (FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D or BMS 341 Minimum Grade of D).
FIN 444  Real Estate Valuation - W  3 cr
Emphasis is given to the valuation process and the analysis that leads to valid estimates of value. The cost, sales comparison, and income approaches to value are examined and illustrated within the Uniform Standards of Professional Appraisal Practice requirements. Preparation of typical valuation reports is covered.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D and FIN 344 Minimum Grade of D or MKT 345 Minimum Grade of D and EH 101 Minimum Grade of C and EH 102 Minimum Grade of C.

FIN 445  Life and Disability Insurance  3 cr
Principles and practices of insurance used for family and income protection against premature death and disability; retirement and pension plans including group insurance and social security.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 446  Real Estate Finance & Invest  3 cr
Analysis of income property debt and equity instruments, financing documents, financial analysis and risk scenarios of different property types, and relevant local, state, and federal laws and court cases.
Pre-requisite: FIN 344 Minimum Grade of D or MKT 345 Minimum Grade of D and FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 448  Real Estate Law  3 cr
A detailed examination of the contracts, documents, and instruments used in a transaction on one or more of the real property rights, and relevant local, state, and federal laws and court cases.
Pre-requisite: FIN 344 Minimum Grade of D or MKT 345 Minimum Grade of D.

FIN 470  Depository Institution Mgt I  3 cr
Analysis of depository institution management processes focusing on management of capital, assets, and liabilities with emphasis on the regulatory environment in which depository institutions operate.
Pre-requisite: (FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D).

FIN 471  Depository Institutions Mgt II  3 cr
In-depth analysis of consumer, real estate, commercial, and agricultural lending areas of depository institution.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 490  Special Topics  3 cr
Designed to provide senior students an opportunity to study selected topics of particular interest. A student may count no more than six hours of Special Topics in the concentration.
Prerequisite: Approval of Department Chair.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 492  Seminar - Finance  3 cr
Oral reports on readings of various aspects of business finance.
Pre-requisite: FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D.

FIN 494  Directed Studies  3 cr
Primarily designed to give superior students an opportunity to study selected topics of particular interest. Grades are awarded on a satisfactory/unsatisfactory basis.
Prerequisites: a cumulative GPA 2.5 and approval of Department Chair.
Pre-requisite: (FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D) and FIN 343 Minimum Grade of D and FIN 410 Minimum Grade of D and FIN 350 Minimum Grade of D and (FIN 420 Minimum Grade of D or FIN 441 Minimum Grade of D).

FIN 496  Finance Internship  3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed projects under the supervision of Department Chair. No more than three hours of internship may be counted toward a degree in the Mitchell College of Business. Prerequisites: Junior or Senior Standing, declared major in Finance, overall GPA of at least 2.5, and Internship Agreement signed by department Chair.
Pre-requisite: (FIN 315 Minimum Grade of D or FIN 341 Minimum Grade of D) and FIN 343 Minimum Grade of D.

FIN 497  Finance Internship II  3 cr
The internship program is designed to give students practical experience in their field of study. Students will complete directed learning experiences under the supervision of the Department Chair. Prerequisites: Junior or Senior standing, declared major in Finance, overall GPA of at least 2.5 and internship agreement signed by Department Chair.
Pre-requisite: FIN 496 Minimum Grade of P.

FIN 508  Introduction to Corp Finance  3 cr
Coverage of fundamental finance concepts and techniques. Major topics include time value of money, risk, asset valuation including fixed income securities and stock, financial markets, term structure of interest rates, risk management (derivatives), and multinational financial management issues. Cases will be used as appropriate.

FIN 590  Sp Top -  3 cr
Designed to provide graduate students an opportunity to study selected topics. (A student may count no more than 3 hours of Special Topics in the M.B.A. degree program).
Prerequisites: Approval of Department Chair
Pre-requisite: MBA Prerequisites P

FIN 594  Independent Study in Finance  3 cr
Reading and research on selected topics. Conference and formal research report required. Prerequisites: Approval of Department Chair.
Pre-requisite: MBA Prerequisites P
# Foreign Language Lesser Taught (LGS)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>LGS 101</td>
<td>Introductory Japanese I</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>The first of a two-semester sequence in Introductory Japanese. The goal of the course is to introduce students to Japanese as it is spoken today. Emphasis on developing speaking and listening skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. LGS 101 is a NASILP course. Fee. Core Course.</td>
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<tr>
<td>LGS 102</td>
<td>Introductory Japanese II</td>
<td>3 cr</td>
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<tr>
<td>LGS 106</td>
<td>Introductory Arabic I</td>
<td>3 cr</td>
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<td></td>
<td>The first of a two-semester sequence in Introductory Arabic. Its purpose is to introduce students to Arabic as it is spoken today. Emphasis on developing speaking and listening skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Study requires extensive use of audio-tapes. LGS 106 is a NASILP course. Fee. Core Course.</td>
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<tr>
<td>LGS 107</td>
<td>Introductory Arabic II</td>
<td>3 cr</td>
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<td></td>
<td>A continuation of Arabic I.Fee. Core Course. Pre-requisite: LGS 106 Minimum Grade of C.</td>
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<tr>
<td>LGS 110</td>
<td>Intro American Sign Language I</td>
<td>3 cr</td>
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<td>The first of a two-semester sequence in introductory American Sign Language (ASL). The goal of the two-semester course is to introduce students to ASL as it is used today. Emphasis is on developing skills in signing through intensive drills, exposure to basic ASL structural patterns and functional vocabulary. LGS 110 is a LTLs course. Fee.</td>
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<tr>
<td>LGS 111</td>
<td>Intro American Sign Lang II</td>
<td>3 cr</td>
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<td>The second of a two-semester sequence in introductory ASL. The goal of the two-semester course is to introduce students to ASL as it is used today. Emphasis is on developing skills in signing through intensive drills, exposure to basic ASL structural patterns and functional vocabulary. LGS 111 is a LTLs course. Fee. Pre-requisite: LGS 110 Minimum Grade of C.</td>
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<tr>
<td>LGS 131</td>
<td>Introductory Hindi I</td>
<td>3 cr</td>
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<td>LGS 131 is the FIRST of a two semester sequence of Introductory Hindi. The course develops speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course.</td>
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<tr>
<td>LGS 141</td>
<td>Introductory Greek I</td>
<td>3 cr</td>
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<td></td>
<td>The first of a two-semester sequence in Introductory Modern Greek. The goal of the course is to introduce students to Greek as it is spoken today. Emphasis on developing speaking and listening skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. LGS 141 is a NASILP course. Fee. Core Course.</td>
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<tr>
<td>LGS 142</td>
<td>Introductory Greek II</td>
<td>3 cr</td>
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<td></td>
<td>A continuation of Introductory Greek I. Fee. Core Course. Pre-requisite: LGS 141 Minimum Grade of C.</td>
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<tr>
<td>LGS 161</td>
<td>Introductory Italian I</td>
<td>3 cr</td>
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<td>The first of a two-semester sequence in introductory Italian. Its purpose is to introduce students to Italian as it is spoken today. Emphasis on developing speaking and listening skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Study requires extensive use of audio-tapes. LGS 161 is a NASILP course. Fee. Core course.</td>
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<tr>
<td>LGS 162</td>
<td>Introductory Italian II</td>
<td>3 cr</td>
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<td>LGS 162 is the second of a two semester sequence of Introductory Italian I. As a continuation of Introductory Italian I, the course continues to develop speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course. Pre-requisite: LGS 161 Minimum Grade of C.</td>
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<tr>
<td>LGS 171</td>
<td>Introductory Korean I</td>
<td>3 cr</td>
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<td>LGS 171 is the first of a two semester sequence of Introductory Korean. The course develops speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course.</td>
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<tr>
<td>LGS 172</td>
<td>Introductory Korean II</td>
<td>3 cr</td>
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<td>The second of a two-semester sequence in introductory Korean. The goal of the two-semester course is to introduce students to Korean as it is spoken today. Emphasis is on building upon skills learned in LGS 171 and developing speaking and listening skills through intensive drills, exposure to basic structural patterns and functional vocabulary. LGS 172 is an LTLs course. Fee. Core Course. Pre-requisite: LGS 171 Minimum Grade of C.</td>
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<tr>
<td>LGS 181</td>
<td>Introductory Portuguese I</td>
<td>3 cr</td>
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<td>LGS 181, Introductory Portuguese I (3 credit hours). The first of a two-semester sequence in introductory Portuguese. Its purpose is to introduce students to Portuguese as it is spoken today. Emphasis on developing speaking and listening skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Study requires extensive use of audio-tapes. LGS 181 is a NASILP course. Fee. Core Course.</td>
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</table>
LGS 182 Introductory Portuguese II 3 cr
LGS 182 is the second of a two semester sequence of Introductory Portuguese. As a continuation of Introductory Portuguese I the course continues to develop speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course. Pre-requisite: LGS 181 Minimum Grade of C.

LGS 190 Special Topics - 3 cr
Topics to be determined by student need and interest. Course may be repeated when content varies for a maximum of six hours. LGS 190 is a NASILP course. Enrollment by special permission. Fee.

LGS 201 Intermediate Japanese I 3 cr
The first of a two-semester sequence. A continuation of the training necessary to build fluency in understanding and speaking Japanese. LGS 201 is a NASILP course. Fee. Core Course. Pre-requisite: (LGS 102 Minimum Grade of C or LGS 103 Minimum Grade of D).

LGS 202 Intermediate Japanese II 3 cr
A continuation of LGS 201. Fee. Core Course. Pre-requisite: LGS 201 Minimum Grade of C.

LGS 206 Intermediate Arabic I 3 cr
The first of two-semester sequence in Intermediate Arabic. This is a continuation of Introductory Arabic II. It continues to develop speaking and listening skills as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Study requires extensive use of audio-tapes. Fee. Core course. Pre-requisite: (LGS 107 Minimum Grade of C or LGS 108 Minimum Grade of D).

LGS 207 Intermediate Arabic II 3 cr
A continuation of Intermediate Arabic I. Fee. Core Course. Pre-requisite: LGS 206 Minimum Grade of C.

LGS 210 Intermediate ASL I 3 cr
The first of a two-semester sequence in intermediate ASL. This is a continuation of Introductory ASL II. It continues to develop signing and interpreting skills through intensive drills, exposure to the basic ASL structure patterns and functional vocabulary. LGS 210 is a LTL course. Fee. Core Course. Pre-requisite: LGS 111 Minimum Grade of C.

LGS 211 Intermediate ASL II 3 cr
A continuation of Intermediate ASL I. LGS 211 is a LTL course. Fee. Core Course. Pre-requisite: LGS 210 Minimum Grade of C.

LGS 221 Intermediate Chinese I 3 cr
The first of a two-semester sequence. A continuation of Introductory Chinese. It continues to develop speaking and listening skills, as well as reading and writing skills, through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course. Pre-requisite: (LGS 122 Minimum Grade of C or LGS 123 Minimum Grade of D).

LGS 222 Intermediate Chinese II 3 cr
A continuation of Intermediate Chinese I. Fee. Core Course. Pre-requisite: LGS 221 Minimum Grade of C.

LGS 241 Intermediate Greek I 3 cr
The first of a two-semester sequence in Intermediate Modern Greek. A continuation of Introductory Greek II. It continues to develop speaking and listening skills, as well as reading and writing skills, through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course. Pre-requisite: (LGS 142 Minimum Grade of C or LGS 143 Minimum Grade of D).

LGS 242 Intermediate Greek II 3 cr
A continuation of Intermediate Greek I. Fee. Core Course. Pre-requisite: LGS 241 Minimum Grade of C.

LGS 261 Intermediate Italian I 3 cr
The first of a two semester sequence of Intermediate Italian. As a continuation of Introductory Italian II, the course continues to develop speaking and listening skills as well as reading and writing skills, through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course. Pre-requisite: LGS 162 Minimum Grade of C.

LGS 262 Intermediate Italian II 3 cr
LGS 262 is the second of a two semester sequence of Intermediate Italian. As a continuation of Intermediate Italian I the course continues to develop speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course. Pre-requisite: LGS 261 Minimum Grade of C.

LGS 271 Intermediate Korean II 3 cr
The first of a two-semester sequence. A continuation of the training necessary to build proficiency in understanding and speaking Korean. Fee. Core Course. Pre-requisite: LGS 172 Minimum Grade of C.

LGS 272 Intermediate Korean II 3 cr
LGS 281  Intermediate Portuguese I  3 cr
LGS 281 is the first of a two semester sequence of Intermediate Portuguese. As a continuation of Introductory Portuguese II the course continues to develop speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course.
Pre-requisite: LGS 182 Minimum Grade of C.

LGS 282  Intermediate Portuguese II  3 cr
LGS 282 is the second of a two semester sequence of Intermediate Portuguese. As a continuation of Intermediate Portuguese I the course continues to develop speaking and listening skills, as well as reading and writing skills through intensive drills, exposure to basic structural patterns, and functional vocabulary. Fee. Core Course.
Pre-requisite: LGS 281 Minimum Grade of C.

LGS 290  Special Topics -  3 cr
Topics to be determined by student need and interest. Course may be repeated when content varies for a maximum of six hours. LGS 290 is a NASILP course. Enrollment by special permission. Fee.
Pre-requisite: LGS 111 Minimum Grade of C.

LG 101  Introductory Latin I  3 cr
Introductory Latin I is the first half of a two-course sequence in Classical Latin. The goal of the courses is to achieve basic proficiency in understanding and reading Latin and to acquire a basic knowledge of Roman customs, history and culture.
Pre-requisite: LG 101 Minimum Grade of D.

LG 102  Introductory Latin II  3 cr
Introductory Latin II is the second half of a two-course sequence in Classical Latin. The goal of the courses is to achieve basic proficiency in understanding and reading Latin and to acquire a basic knowledge of Roman customs, history and culture.
Pre-requisite: LG 101 Minimum Grade of D.

LG 110  World Languages  3 cr
The general aim of this introductory-level course is to ground students in a basic understanding of the social, political, economic and cultural realities of language around the globe, including the importance of mastering one or more languages other than one's native tongue. Students taking the course will profit from an understanding of language value in the global marketplace and will gain new insight into their own native language through a brief examination of the structures of several of the world's major languages. The course may feature guest presenters and will also discuss techniques of language acquisition.

LG 111  Introductory French I  3 cr
The first of a two-semester sequence in introductory French. The goal of the two-semester sequence is to achieve a basic proficiency in understanding, speaking, reading, and writing French, and to acquire basic knowledge of French-speaking cultures. Fee. Core Course.
Pre-requisite: LG 111 Minimum Grade of D.

LG 112  Introductory French II  3 cr
The second semester of the introductory course. Fee. Core Course.
Pre-requisite: LG 111 Minimum Grade of D.

LG 141  Intro Classical Greek I  3 cr
Introductory Classical Greek I is the first half of a two-course sequence in Classical Greek. The goal of the courses is to achieve basic proficiency in understanding and reading Greek and to acquire a basic knowledge of ancient Greek customs, history, and culture.
LG 142 Intro Classical Greek II 3 cr
Introductory Classical Greek II is the second half of a two-course sequence in Classical Greek. Pre-requisite: LG 141 Minimum Grade of C.

LG 151 Introductory German I 3 cr
The first of a two-semester sequence in introductory German. The goal of the two-semester course is to achieve a basic proficiency in understanding, speaking, reading, and writing German, and to acquire basic knowledge of German-speaking cultures. Fee. Core Course.

LG 152 Introductory German II 3 cr
The second semester of the introductory course. Fee. Core Course. Pre-requisite: LG 151 Minimum Grade of D.

LG 153 Accelerated Intro German 6 cr
A one-semester intensive first-year course for highly motivated students. This course covers the material taught in LG 151 and LG 152 and satisfies the Arts and Sciences Foreign Language requirement. By permission of instructor. Fee. Core Course.

LG 171 Introductory Russian I 3 cr
The first of a two-semester sequence in Introductory Russian. The goal of the two-semester course is to achieve a basic proficiency in understanding, speaking, reading, and writing Russian. Fee. Core Course.

LG 172 Introductory Russian II 3 cr
The second semester of the introductory course. Fee. Core course. Pre-requisite: LG 171 Minimum Grade of D.

LG 173 Accelerated Intro Russian - H 6 cr
A one-semester intensive first-year course for highly motivated students with prior instruction in a foreign language (either high school or college level) with a B average or better. This course covers material taught in LG 171 and 172 and satisfies the Arts and Sciences foreign language requirement. By permission of the instructor. Usually taught in the Spring semester. Fees.

LG 190 Sp Top - 1 TO 3 cr
Topics to be determined by student need and interest. Course may be repeated when content varies for a total of 12 credit hours.

LG 193 Study Abroad 1 TO 6 cr
This course is an introductory language and culture course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.

LG 201 Intermediate Latin I 3 cr
The first of a two-semester sequence in intermediate Latin. The course is a continuation of the study necessary to achieve fluency in reading, understanding, and translating Classical Latin. A comprehensive review of grammar is accompanied with the presentation of material beyond the scope of Introductory Latin I and II. All texts for reading and translation are presented in the original classical texts, unabridged and complete. Emphasis on the development of the periods of classical Roman literature as well as pertinent events in Roman history and culture. Pre-requisite: LG 102 Minimum Grade of C.

LG 202 Intermediate Latin II 3 cr
The second of a two-semester sequence in intermediate Latin. Pre-requisite: LG 201 Minimum Grade of C.

LG 205 Modern Lit in Translation 3 cr
A varying-content course designed to introduce the student to selected major works of one language other than English. Works from English-speaking countries may occasionally be used for the purpose of cross-cultural comparison. The student may choose from a number of specific topics that will be designated prior to each semester. All readings and discussions are in English. May be repeated for credit when course content varies. Foreign Language majors wishing to have one or several of these courses count toward their major must seek prior approval from their advisor. Pre-requisite: (EH 102 Minimum Grade of B or EH 105 Minimum Grade of B).

LG 211 Intermediate French I 3 cr
The first of a two-semester sequence in intermediate French. A continuation of the training necessary to achieve fluency in understanding, speaking, reading and writing French. A comprehensive grammar review is complemented by elaboration of grammatical topics and lexical development beyond the scope of Introductory French I and II. Readings of literary and cultural texts treating French-speaking areas of the world. Emphasis on fluency in conversation and cultural fluency through class discussion of both written and recorded texts from the Francophone world. Fee. Core Course. Pre-requisite: (LG 112 Minimum Grade of C or LG 113 Minimum Grade of C).

LG 212 Intermediate French II 3 cr
The second semester of the intermediate course. Fee. Core Course. Pre-requisite: LG 211 Minimum Grade of C.

LG 213 Accelerated Inter French - H 4 cr
A one-semester intensive intermediate course for students who have successfully completed LG 113 (Accelerated Introductory French-Honors), or the equivalent. This course covers material taught in LG 211 and 212. Usually taught in the Spring semester. By permission of instructor. Fee. Pre-requisite: LG 112 Minimum Grade of C or LG 113 Minimum Grade of C.
LG 221  Intermediate Chinese I  3 cr
First half of the second-year sequence in Modern Standard Mandarin Chinese. Furs- 
the communicative competence in all aspects of language learning: listening, speaking, reading and writing. Students will be able to write essays at the end. Pre-requisite: LG 122 Minimum Grade of D.

LG 222  Intermediate Chinese II  3 cr
Second half of the second-year sequence in Modern Standard Mandarin Chinese. Furthers communicative competence in all aspects of language learning: listening, speaking, reading and writing. Students will be able to write essays at the end. Pre-requisite: LG 221 Minimum Grade of D.

LG 231  Intermediate Spanish I  3 cr
The first of a two-semester sequence in intermediate Spanish. A continuation of the training necessary to achieve fluency. Grammar review, class discussions, extensive oral and written work, short readings in literature and culture are included. Fee. Core Course. Pre-requisite: (LG 132 Minimum Grade of C or LG 133 Minimum Grade of C or LG 134 Minimum Grade of C).

LG 232  Intermediate Spanish II  3 cr
The second semester of the intermediate sequence. Fee. Core Course. Pre-requisite: LG 231 Minimum Grade of C.

LG 234  Inter Spanish Accel -H  6 cr
A one-semester intensive intermediate course for students who have successfully completed LG 134 (Accelerated Introductory Spanish), or the equivalent. This course covers the material taught in LG 231 and 232. Core Course. By permission of the instructor. Fee. Pre-requisite: (LG 132 Minimum Grade of C or LG 133 Minimum Grade of C or LG 134 Minimum Grade of C).

LG 241  Interm Classical Greek I  3 cr
The first of a two-semester sequence in Intermediate Classical Greek. The course is a continuation of the study necessary to achieve fluency in reading, understanding and translating Classical Greek. A comprehensive review of grammar is accompanied with the presentation of material beyond the scope of Introductory Classical Greek I and II. All texts for reading and translation are presented in the original classical texts, unabridged and complete. Emphasis on the development of the periods of classical Greek literature as well as pertinent events in Greek history and culture. Pre-requisite: LG 142 Minimum Grade of C.

LG 242  Interm Classical Greek II  3 cr
The second of a two-semester sequence in Intermediate Classical Greek. Pre-requisite: LG 241 Minimum Grade of C.

LG 251  Intermediate German I  3 cr
The first of a two-semester sequence in Intermediate German. A continuation of the training necessary to achieve fluency in understanding, speaking, reading, and writing German. Reading of literary, cultural, and historical texts. Class discussions, reports in German, both oral and written, are required. Fee. Core Course. Pre-requisite: (LG 152 Minimum Grade of C or LG 153 Minimum Grade of C).

LG 252  Intermediate German II  3 cr
The second semester of the intermediate sequence. Fee. Core Course. Pre-requisite: LG 251 Minimum Grade of C.

LG 271  Intermediate Russian I  3 cr
The first of a two-semester sequence in intermediate Russian. A continuation of the training necessary to achieve fluency and understanding in speaking, reading, and writing Russian. Reading of literary and cultural texts. Increased practice in Russian conversation. Fee. Core Course. Pre-requisite: (LG 172 Minimum Grade of C or LG 173 Minimum Grade of C).

LG 272  Intermediate Russian II  3 cr
The second semester of intermediate Russian. Fee. Core Course. Pre-requisite: LG 271 Minimum Grade of C.

LG 273  Intensive Second Year Russian  4 cr
A one-semester intensive Second Year course for students who have successfully completed the LG 171 and 172 sequence or LG 173 (Intensive First Year Russian). This course covers material taught in LG 271 and 272. By permission of instructor. Fee. Pre-requisite: LG 171 Minimum Grade of C and LG 172 Minimum Grade of C or LG 173 Minimum Grade of C.

LG 283  Chinese HY in Film and Lit  3 cr
This course will introduce students to major topics in Chinese history, covering both ancient periods such as the Three Kingdoms period, and twentieth-century events such as the war with Japan and the Cultural Revolution. Post-Tiananmen Chinese society will also be stressed. Students will explore these themes through Chinese film and literature, and will thus become familiar with major directors, including Zhang Yimou and Jia Zhangke, and writers such as Yu Hua.

LG 290  Sp Top -  1 TO 3 cr
Topics to be determined by student need and interest. Course may be repeated when content varies for a total of 12 hours.

LG 293  Study Abroad  1 TO 6 cr
This course is an introductory language and culture course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.
LG 305  Studies in Gender and Writing  3 cr
A varying-content course that provides an in-depth study of gender-related questions in a literary and cross-cultural context. Unless otherwise indicated, all readings and discussions are in English. May be repeated for credit for a total of nine hours when course content varies. Foreign Language majors wishing to have one or several of these courses count toward their major must seek prior approval from their advisor.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

LG 311  Survey French Lit Culture I  3 cr
The first part of a two-semester course that deals with the major periods of French culture. Readings of representative works from the Middle Ages through the Eighteenth Century. In French.
Pre-requisite: (LG 212 Minimum Grade of C or LG 213 Minimum Grade of C).

LG 312  Survey French Lit Culture II  3 cr
The second part of a two-semester course that deals with the major periods of French culture. Readings of representative works from the Nineteenth and Twentieth Centuries. In French.
Pre-requisite: (LG 212 Minimum Grade of C or LG 213 Minimum Grade of C).

LG 314  Advanced French Conversation  1 cr
Intensive conversation with practice using various levels of the spoken language from slang to formal speech. Emphasis on the sounds and idioms of French. The course meets one hour per week with the instructor and one hour per week for a lab session, often with a native speaker.
The content of this course will vary over four consecutive semesters. This course may be repeated for a maximum of four credits.
Pre-requisite: LG 212 Minimum Grade of C or LG 213 Minimum Grade of C.

LG 326  Adv French Grammar-Conversatn  3 cr
Comprehensive review of French grammar coupled with weekly practice in conversation using various levels of the spoken language from slang to formal speech. Emphasis on vocabulary acquisition and mastering the more complex features of French grammar.
Pre-requisite: (LG 212 Minimum Grade of C or LG 213 Minimum Grade of C).

LG 327  Adv French Comp-Conversatn - W  3 cr
Intensive course in writing French coupled with oral presentations and activities designed to enhance the student's command of the language.
Pre-requisite: LG 212 Minimum Grade of C or LG 213 Minimum Grade of C.

LG 333  Spanish Conversatn-Comp  3 cr
Extensive oral and written work through a variety of activities to review and reinforce acquired language skills, emphasizing vocabulary acquisition and fluency in the language.
Pre-requisite: (LG 232 Minimum Grade of C or LG 234 Minimum Grade of C).

LG 334  Adv Spanish Grammar-Comp - W  3 cr
Extensive study of major aspects of Spanish grammar with emphasis on increasing proficiency in the four language skills. Special emphasis is placed on descriptive and narrative writing.
Pre-requisite: LG 232 Minimum Grade of C or LG 234 Minimum Grade of C.

LG 335  Commercial-Technical Spanish  3 cr
Advanced course in written and spoken business and technical Spanish. Emphasis on writing proficiency in various aspects of business, government, technical and general commercial writing. Development of related speaking skills for commerce. Note: This course cannot be counted toward fulfilling degree requirements for B.A. concentration in Spanish.
Pre-requisite: LG 333 Minimum Grade of C or LG 334 Minimum Grade of C.

LG 336  Intro Textual Analys Hisp Lit  3 cr
Introductory course to literary analysis, literary and critical terminology, and genres as they appear in short works from both Spain and Latin America.
Pre-requisite: LG 232 Minimum Grade of D or LG 234 Minimum Grade of D.

LG 337  Spanish for Medical Prof  3 cr
LG 337 is designed for the advanced language student interested in further developing his/her linguistic proficiency in Spanish while acquiring terminology useful to the health care professional. In addition, the course affords the student an opportunity to gain insight into the health care needs of the non-English speaking Hispanic population in the U.S., as well as to begin understanding in general terms its diverse cultural milieu. The course is highly interactive and is conducted in its entirely in the target language. Note: This course cannot be counted toward fulfilling degree requirements for B.A. concentration in Spanish.
Pre-requisite: LG 333 Minimum Grade of B and LG 334 Minimum Grade of B.

LG 338  Spanish for Legal Professions  3 cr
Spanish for Legal Professionals introduces students to legal Spanish language as well as topics about the nature and functioning of law in the Spanish-speaking world and, in this country, the impact of the US legal system on the US-Hispanic population.
Pre-requisite: LG 232 Minimum Grade of B or LG 333 Minimum Grade of C or LG 334 Minimum Grade of C or LG 335 Minimum Grade of C or LG 336 Minimum Grade of C.
LG 348  19th C Cntl Phil-Lit Theory  3 cr
An examination of selected themes and issues in 19th Century Continental Philosophy and Literary Theory. Topics may include Idealism, Romanticism, Existentialism, Marxism, Freudianism. Identical with PHL 348 and EH 348. Credit cannot be received for both LG 348 and either PHL 348 or EH 348. (For LG credit, students will be required to do some coursework in their language of concentration.)

LG 349  20th C Cntl Phil-Lit Theory  3 cr
An examination of selected themes and issues in 20th Century Continental Philosophy and Literary Theory. Topics may include Phenomenology, Existentialism, Hermeneutics, Structuralism, and Post-Structuralism. Identical with PHL 349 and EH 349. Credit cannot be received for both LG 349 and either PHL 349 or EH 349. (For LG credit, students will be required to do some coursework in their language of concentration.)

LG 351  Mythen, Marchen und Musik  3 cr
In this course we will critically examine some of the myths and legends that form the foundation of some of Germanic civilization's most powerful cultural artifacts. By examining artistic interpretations and reinterpretations of these myths, we will come to a deeper understanding of the foundational role they play in German culture. Among the myths, legends and fairy tales we will consider are that of the hero Siegfried, the Faust myth, and the legend of Kaspar Hauser. Further, through a dialectic examination of how these myths are presented in text and music, students in this course will come to a deeper understanding of the importance of music to the totality of German culture. Composers whose work will be considered include Mozart, Beethoven, Mendelssohn and Wagner. This course will be conducted in German. Pre-requisite: LG 252 Minimum Grade of C.

LG 352  Crisis, Change, Transformation  3 cr
This course explores how literature reflects various crises in the German-speaking world-cultural, linguistic, social, and political. Various literary forms, including short stories, novellas, and poems form the Middle Ages through the 21st century, will allow us to explore the source of the crisis as well as the proposed solutions, tracing these themes over the centuries. We will look at these crucial turning points, focusing on some key questions: What defines a crisis? Who (individual, family, group, nation) experiences it? How are these parties impacted? How do cultural or social or political norm shift? What kind of change, adjustment, or transformation is suggested in our text(s)? How does the crisis and/or its resolution later evolve? This course will be conducted in German. Pre-requisite: LG 252.

LG 361  German Lit thru Classicism  3 cr
Origin and development of German Civilization (literature, thought, the arts, and society in a historical context) during the period of unification and industrialization, including Romanticism, Realism, Naturalism, and early Modernism. Extensive reading, class discussion, and oral and written reports in the language are required. Pre-requisite: LG 252 Minimum Grade of C or LG 253 Minimum Grade of C.

LG 362  German Cult-Lit 19th Century  3 cr
Development of German civilization (literature, thought, the arts, and society in a historical context) during the period of unification and industrialization, including Romanticism, Realism, Naturalism, and early Modernism. Extensive reading, class discussions, and oral and written reports in the language are required. Pre-requisite: (LG 252 Minimum Grade of C or LG 253 Minimum Grade of C).

LG 363  Modern-Contemp German Cult-Lit  3 cr
Development of German civilization (literature, thought, the arts, and society in a historical context) from the early twentieth century through the present. Extensive reading, class discussions, and oral and written reports in the language are required. Pre-requisite: (LG 252 Minimum Grade of C or LG 253 Minimum Grade of C).

LG 364  Highlights German Cult-Lit  3 cr
A capstone course highlighting masterpieces of German literature and culture from a particular genre (e.g., the Novelle); a particular period or movement (e.g., Romanticism); an author or group of authors (e.g., Brecht); or a particular thematic focus. Extensive readings, class discussions, and oral and written reports in the language are required. Pre-requisite: LG 251 Minimum Grade of C or LG 252 Minimum Grade of C.

LG 366  Adv German Grammar  3 cr
Designed for the student who wishes to teach or do advanced work. Comprehensive study of formal grammar and structured practice in oral and written expression. Pre-requisite: (LG 252 Minimum Grade of C or LG 253 Minimum Grade of C).

LG 367  Adv German Conversation  1 cr
Intensive conversation with practice in using various levels of the spoken language from slang to formal speech. Emphasis on the sounds and idioms of German. The course meets for one hour per week with the instructor and one hour per week for a lab session, often with a native speaker. The content of this course will vary over four consecutive semesters. This course may be repeated for a maximum of four credits. Pre-requisite: (LG 252 Minimum Grade of C or LG 253 Minimum Grade of C).
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>LG 380</td>
<td>Russian Poetry</td>
<td>3 cr</td>
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<td>Designed to enhance the student's overall command of spoken Russian through the study of Russia's rich poetic tradition. Russian poems and songs provide the basic materials for this course. Lectures, materials, and discussions in Russian. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 374</td>
<td>Adv Russian Grammar</td>
<td>3 cr</td>
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<td>A course designed to give students active control of the more complex features of Russian grammar. Structured practice in oral and written expression. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 375</td>
<td>Adv Russian Conversation</td>
<td>2 cr</td>
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<td>Intensive conversation practice in using the various levels of modern spoken Russian. The course meets two hours per week. The content of this course will vary over eight consecutive semesters. This course may be repeated for a maximum of eight credits. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 376</td>
<td>Adv Russian Composition - W</td>
<td>3 cr</td>
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<td>This course provides extensive practice in writing Russian. Students read, discuss, and write about texts which reflect the controversial and topical issues of the day. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 372</td>
<td>Golden Age of Russian Lit - W</td>
<td>3 cr</td>
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<td>A survey course designed to familiarize the student with the essential works of 19th century Russian literature. Students read and discuss works by Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov. In English. Russian majors are required to read excerpts of works in Russian and to complete a course project in Russian. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 373</td>
<td>Intensive Third Year Russian</td>
<td>4 cr</td>
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<td>A one-semester intensive Third Year course for students who have successfully completed the LG 271 and 272 sequence or LG 273 (Intensive Second Year Russian). This course is usually taught during the spring following LG 273, abroad during the summer or in the Fall following a semester abroad and acts as a bridge course. This course is meant to fill in any gaps in knowledge of Russian grammar before continuing to Advanced Grammar and Composition courses. Special attention is paid to nuances in Russian culture. By permission of instructor. Pre-requisite: LG 271 Minimum Grade of C and LG 272 Minimum Grade of C or LG 273 Minimum Grade of C.</td>
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<tr>
<td>LG 381</td>
<td>Russian Prose in Context</td>
<td>3 cr</td>
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<td>A course designed to enhance the student's ability to read, translate, and discuss Russian texts. Students read works from both 19th and 20th century fiction, which they analyze both thematically and stylistically. Class work and assignments are geared towards increasing the student's vocabulary and understanding of Russian stylistics. All texts, lectures, and discussions in Russian. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 378</td>
<td>Adv German Composition - W</td>
<td>3 cr</td>
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<td>Intensive course in writing German. Emphasis is on writing as a process, the communicative purposes of writing, and the development of critical reflection. Analysis of authentic texts and extensive practice in various genres of written German, including description, narrative, report, critical review, and interpretation. Pre-requisite: (LG 252 Minimum Grade of C or LG 253 Minimum Grade of C).</td>
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<tr>
<td>LG 384</td>
<td>Japanese Film</td>
<td>3 cr</td>
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<td>This course will introduce students to major themes in recent Japanese history, including samurai culture and other issues pertaining to social class, Westernization, the postwar family, sixties radicalism, and recent popular culture. Students will explore these themes through Japanese film and literature, and will thus become familiar with major directors, including Akira Kurosawa, Yasujiro Ozu and Juzo Itami, and novelists such as Junichiro Tanizaki and Yukio Mishima.</td>
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<tr>
<td>LG 383</td>
<td>Advanced Russian Grammar</td>
<td>3 cr</td>
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<td>This course provides in-depth study of Russian grammar. Structured practice in oral and written expression. Pre-requisite: LG 272 Minimum Grade of C.</td>
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<tr>
<td>LG 382</td>
<td>Advanced Russian Conversation</td>
<td>2 cr</td>
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<td>Intensive conversation practice using the various levels of modern spoken Russian. The course meets two hours per week. The content of this course will vary over eight consecutive semesters. This course may be repeated for a maximum of eight credits. Pre-requisite: LG 272 Minimum Grade of D.</td>
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<tr>
<td>LG 379</td>
<td>Special Topics -</td>
<td>1 TO 6 cr</td>
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<td>Topics to be determined by student need and interest. Course may be repeated for a total of 12 hours. Pre-requisite: (LG 212 Minimum Grade of C or LG 213 Minimum Grade of C) or (LG 232 Minimum Grade of C or LG 234 Minimum Grade of C) or (LG 252 Minimum Grade of C or LG 253 Minimum Grade of C or LG 272 Minimum Grade of C). LG 212 and LG 213 and LG 232 and LG 234 and LG 252 and LG 253 and LG 272 can be taken concurrently with this course.</td>
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<tr>
<td>LG 390</td>
<td>Study Abroad</td>
<td>1 TO 6 cr</td>
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<td>This course is an advanced language and culture course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.</td>
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<tr>
<td>LG 394</td>
<td>Dir St PreStudy Abrd -</td>
<td>1 cr</td>
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<td>Working under the direction of their faculty advisor, language majors will prepare for their required study abroad experience through an examination of selected country-specific readings as well as cross-cultural orientation materials. Prerequisite: completion of intermediate sequence in student's concentration or equivalent. Pre-requisite: (LG 212 Minimum Grade of B or LG 213 Minimum Grade of B) or (LG 252 Minimum Grade of B or LG 253 Minimum Grade of B or LG 272 Minimum Grade of B) or LG 271 Minimum Grade of B.</td>
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<tr>
<td>LG 400</td>
<td>Applied Linguistics</td>
<td>3 cr</td>
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<td>LG 400 is one of the required core classes for the Applied Linguistics minor. The course introduces linguistics concepts to the students and gives them the foundation needed for the higher level classes required as part of the minor. Required core course. Pre-requisite: LG/LGS 200-level sequence with a C or better and sophomore standing. Pre-requisite: LG 200 Minimum Grade of C or LGS 200 Minimum Grade of C. LG 200 and LGS 200 can be taken concurrently with this course.</td>
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</tbody>
</table>
LG 412 Readings Francophone Lit 3 cr
Study of the literature of the Francophone world, including West and North Africa, the Caribbean, and Quebec, in their cultural and historical context.
Pre-requisite: (LG 311 Minimum Grade of C or LG 323 Minimum Grade of C) or (LG 312 Minimum Grade of C or LG 325 Minimum Grade of C).

LG 415 Readings in the French Novel 3 cr
Study of the development of the novel in French from the romantic period through the contemporary novel.
Pre-requisite: (LG 311 Minimum Grade of C or LG 323 Minimum Grade of C) or (LG 312 Minimum Grade of C or LG 325 Minimum Grade of C).

LG 416 Identites Francaises 3 cr
Study of how different minority groups have been represented and have represented themselves in Nineteenth and Twentieth Century French and Francophone literature, essays, and film.
Pre-requisite: (LG 311 Minimum Grade of C or LG 323 Minimum Grade of C) or (LG 312 Minimum Grade of C or LG 325 Minimum Grade of C).

LG 431 Hispanic Civilizations 3 cr
In-depth study of various aspects of Hispanic civilization and its contribution to world culture; emphasis upon on geographical, historical, social, political and artistic forces. Extensive class discussion, oral and written reports in the language are required.
Pre-requisite: LG 333 Minimum Grade of C or LG 334 Minimum Grade of C or LG 336 Minimum Grade of C.

LG 432 Rdgs in Spanish Literature 3 cr
Representative readings reflecting major literary movements and cultural events in Spain. Extensive class discussion, oral and written reports are required.
Pre-requisite: LG 333 Minimum Grade of C or LG 334 Minimum Grade of C or LG 336 Minimum Grade of C.

LG 433 Rdgs in Latin Amer Literature 3 cr
Representative readings reflecting major literary movements and cultural events in Latin America. Extensive class discussions, oral and written reports are required.
Pre-requisite: LG 333 Minimum Grade of C or LG 334 Minimum Grade of C or LG 336 Minimum Grade of C.

LG 451 The Aesthetic Lens 3 cr
In this course we will examine the tectonic shifts in German culture and history from the founding of the Welmar Republic to the present through the lens of lyric poetry and film. For each major period-the Welmar Republic: National Socialism and Second World War; the postwar period; the rise and fall of the Berlin Wall; Reunification—we will study the major poetic voices and two films both on their own aesthetic merits and relative to the historical contexts within which they were produced. We will also analyze the relationship between these works of art and the historical context in which they were produced. This class will be conducted in German.
Pre-requisite: LG 366 Minimum Grade of C and LG 367 Minimum Grade of C and LG 368 Minimum Grade of C.

LG 480 Senior Seminar - W 3 cr
This course is designed to broaden and enhance the study-abroad experience and to serve as a capstone to the foreign-language major. Building on the study-abroad experience, students will (1) contextualize their experience through readings, (2) continue their experience by maintaining consistent contact with the target culture, and (3) communicate their experience and their enhanced understanding of topics such as culture shock, culture stereotypes, cultural metaphors, and cross cultural comparisons of behavior and mind-set. Classes will consist of lectures, discussions of readings, and a major research paper and public presentation of their research. Capstone Course. Prerequisite: completion of the Study Abroad requirement.
Pre-requisite: EH 102 Minimum Grade of C and IS 391 Minimum Grade of S.

LG 490 Special Topics - 1 TO 6 cr
Topics to be determined by student need and interest. Course may be repeated when content varies. A subtitle identifying the topic will be entered on the student's record.

LG 492 Seminar - 1 TO 3 cr
A course designed for advanced students to pursue a special topic in depth through readings, critical discussions, and delivery of a seminar paper. This course may be repeated for a maximum of 6 credits. Prerequisite: Normally limited to juniors and seniors.

LG 493 Study Abroad 1 TO 6 cr
This course is an advanced language and culture course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.

LG 494 Directed Studies- 1 TO 3 cr
Directed study under the supervision of a member of the foreign language faculty. This course may be repeated for a maximum of 6 credits. Requires permission of department chair.
**LG 496 Internship - Foreign Languages**  
1 TO 9 cr  
Supervised professional work with mandatory reading list and written report. This course may be repeated for a maximum of nine credits. Prerequisites: Permission of the Department Chair is required.

**LG 499 Honors Senior Project - H**  
3 TO 6 cr  
Under the advice and guidance of a faculty mentor Honors Students will identify and carry out a research project, relevant to the field of foreign language study, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor.

**LG 590 Sp Top -**  
1 TO 3 cr  
Topics to be determined by student need and interest. Content will vary. A subtitle identifying the topic will be entered on the student's record.

**LG 592 Seminar -**  
1 TO 3 cr  
A course designed for graduate students to pursue a special topic in-depth with readings, critical discussion and delivery of a seminar paper.

**LG 594 Directed Studies-**  
1 OR 3 cr  
Directed study under the supervision of a member of the Foreign Languages and Literatures faculty having Graduate Faculty status. This course may be repeated for a maximum of 15 credits. Prerequisite: Permission of department chair.

**Gender Studies (GS)**

**GS 101 Intro to Gender Studies**  
3 cr  
This course provides an interdisciplinary, multicultural overview of the concept of gender and gender roles in patriarchal society. This course examines the social construction of gender in our society and how that has shaped such areas as economics, politics, cultural/social values, and the impact upon women and men in historical and contemporary terms.

**GS 290 Special Topics -**  
3 cr  
Study of selected topics with an area in gender studies. May be repeated for credit when content varies.

**GS 490 Special Topics**  
3 cr  
Advanced study of selected topics within an area in Gender Studies. May be repeated for credit when content varies for a total of six hours.

**GS 492 Gender Studies Seminar -**  
3 cr  
Advanced study of selected topics in Gender Studies. May be repeated for credit when content varies for a total of six hours.

**GS 494 Directed Studies**  
1 TO 3 cr  
Directed research under the guidance of a Gender Studies faculty member. Requires permission of instructor. Student is restricted to taking a maximum of six hours of Directed Studies.  
Pre-requisite: GS 101 Minimum Grade of D.

**GS 496 Internship -**  
3 TO 6 cr  
Practical learning through occupational or community work with an approved agency dealing with gender-related issues. Readings and final report supervised by gender studies faculty. Special Permission required.  
Pre-requisite: GS 101 Minimum Grade of D.

**Geographic Info Technology (GIT)**

**GIT 420 Computer Apps in Earth Science**  
4 cr  
An introduction to basic Python programming, with examples and exercises pertinent to Earth Science and GIS applications.  
Pre-requisite: MA 112 Minimum Grade of D or MA 110 Minimum Grade of C.

**GIT 442 Remote Sensing II**  
4 cr  
Analysis of remotely sensed digital data for detection and mapping of Earth resources. Minimum grade of "B" needed in course prerequisite. Fee.  
Pre-requisite: (GEO 332 Minimum Grade of B or GY 332 Minimum Grade of B).

**GIT 460 Intro to GIT**  
4 cr  
Fundamentals of Geographic Information Systems technology, including software functionality (ArcGIS), data processing, cartography and spatial analysis. Fee.  
Pre-requisite: CIS Proficiency Exam P

**GIT 461 GIT Applications I-Environment**  
4 cr  
Application of Geographic Information Systems to the studies of the natural environment. Fee.  
Pre-requisite: (GIT 460 Minimum Grade of C or GEO 460 Minimum Grade of C or GY 460 Minimum Grade of C).

**GIT 462 GIT Apps II-Business/Soc Sci**  
4 cr  
Application of Geographic Information Systems to Business and the Social Sciences. Prerequisite: GIS 460, with a grade of "C" or better, or permission of instructor. Fee.  
Pre-requisite: (GIT 460 Minimum Grade of C or GEO 460 Minimum Grade of C or GY 460 Minimum Grade of C).

**GIT 490 Special Topics**  
2 TO 4 cr  
Geographic Information Technology topics not covered in current GIT courses. May be repeated when content varies for a maximum of 8 credit hours.  
Pre-requisite: GIT 460 Minimum Grade of C or GEO 460 Minimum Grade of C or GY 460 Minimum Grade of C.
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Pre-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIT 494</td>
<td>Directed Studies</td>
<td>2 TO 4 cr</td>
<td>Geographic Information Technology topics not covered in current GIT courses. May be repeated when content varies for a maximum of 8 credit hours.</td>
<td>GIT 460 Minimum Grade of C or GEO 460 Minimum Grade of C.</td>
</tr>
<tr>
<td>GIT 496</td>
<td>Internship in GIT</td>
<td>1 TO 4 cr</td>
<td>On-the-job learning through occupational or professional work with an approved firm or agency. Open to geography majors only. No more than 4 hours of internship credit is allowed.</td>
<td>GIT 460 Minimum Grade of C or GEO 460 Minimum Grade of C.</td>
</tr>
<tr>
<td>GIT 520</td>
<td>Computer Apps in Earth Science</td>
<td>4 cr</td>
<td>An introduction to basic Python programming, with examples and exercises pertinent to Earth Sciences and GIS applications.</td>
<td>MA 112 Minimum Grade of D or MA 110 Minimum Grade of D.</td>
</tr>
<tr>
<td>GIT 542</td>
<td>Remote Sensing II</td>
<td>4 cr</td>
<td>Analysis of remotely sensed digital data for detection and mapping of Earth resources. Minimum grade of &quot;B&quot; needed in course prerequisite. Special project required. Fee.</td>
<td>(GEO 332 Minimum Grade of B or GY 332 Minimum Grade of B).</td>
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<tr>
<td>GIT 560</td>
<td>Intro to GIT</td>
<td>4 cr</td>
<td>Fundamentals of Geographic Information Systems technology, including software functionality (ArcGIS), data processing, cartography and spatial analysis. Credit for GIT 460 and GIT 560 not allowed. Special project required. Fee.</td>
<td>CIS 150 Minimum Grade of B or CIS Proficiency Exam P.</td>
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<tr>
<td>GIT 561</td>
<td>GIT Apps I-Environment - C</td>
<td>4 cr</td>
<td>Application of Geographic Information Systems to the studies of the natural environment. Credit for GIT 461 and GIT 561 not allowed. Special project required. Fee.</td>
<td>(GIT 460 Minimum Grade of C or GIT 560 Minimum Grade of C or GEO 460 Minimum Grade of C or GY 460 Minimum Grade of C or GEO 560 Minimum Grade of C).</td>
</tr>
<tr>
<td>GIT 562</td>
<td>GIT Apps II-Business/Soc Sci</td>
<td>4 cr</td>
<td>Application of Geographic Information Systems to business and the social science. Credit for GIT 462 and GIT 562 not allowed. Special project required. Fee.</td>
<td>(GIT 460 Minimum Grade of C or GEO 460 Minimum Grade of C or GY 460 Minimum Grade of C or GIT 560 Minimum Grade of C or GEO 560 Minimum Grade of C).</td>
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<tr>
<td>GIT 590</td>
<td>Special Topics -</td>
<td>2 TO 4 cr</td>
<td>Geographic Information Technology topics not covered in current GIT courses. May be repeated when content varies for a maximum of 8 credit hours.</td>
<td>GIT 460 Minimum Grade of C or GIT 560 Minimum Grade of C or GEO 460 Minimum Grade of C or GY 460 Minimum Grade of C or GEO 560 Minimum Grade of C.</td>
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<tr>
<td>GIT 594</td>
<td>Directed Studies</td>
<td>1 TO 4 cr</td>
<td>Graduate level independent study under the direction of a member of the graduate faculty. May be used to learn new techniques or to explore research questions of special interests.</td>
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**Geography (GEO)**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Pre-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 101L</td>
<td>Atmospheric Processes Lab</td>
<td>1 cr</td>
<td>Laboratory exercises associated with GEO 101. GEO 101 must be taken concurrently. Together, GEO 101 and GEO 101L count as one laboratory science course, partially fulfilling general education requirements. Fee.</td>
<td>Co-requisite: GEO 101</td>
</tr>
<tr>
<td>GEO 102L</td>
<td>Landscape Processes Lab</td>
<td>1 cr</td>
<td>Laboratory exercises associated with GEO 102. GEO 102 must be taken concurrently. Together, GEO 102 and GEO 102L count as one laboratory science course, partially fulfilling general education requirements. Fee.</td>
<td>Co-requisite: GEO 102</td>
</tr>
<tr>
<td>GEO 101</td>
<td>Atmospheric Processes</td>
<td>3 cr</td>
<td>Introduces students to the natural science branch of geography. Emphasizes Earth-Sun relationships, weather and climate. Core Course.</td>
<td>Co-requisite: GEO 101L</td>
</tr>
<tr>
<td>GEO 102</td>
<td>Landscape Processes</td>
<td>3 cr</td>
<td>Introduces students to the natural science branch of geography. Emphasizes spatial patterns and processes related to natural landscape regions and landforms. Core Course.</td>
<td>Co-requisite: GEO 102L</td>
</tr>
<tr>
<td>GEO 114</td>
<td>Intro to Human Geography</td>
<td>3 cr</td>
<td>This course introduces students to the social sciences branch of geography. Emphasis is placed on the location, spatial arrangement, and spatial interaction of the human environment which includes: population, culture, geopolitics, economic activity, and settlements. Core Course.</td>
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<td>GEO 115</td>
<td>World Regional Geography</td>
<td>3 cr</td>
<td>A survey of the major regions of the world, excluding North America, and the interrelationship of environmental, cultural, economic, and political factors that characterize each. Core Course.</td>
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</table>
GEO 201  Geography Orientation  1 cr
This 1-credit hour course will cover topics that are important to geography students, such as: which geography courses to choose, the major sub-disciplines of geography, and career choices available for geography majors. You will meet the Geography faculty as they give brief overviews of the courses they teach and their research interests. Field trips, which will generally take place during the class time, are included in the course and will showcase examples of the research interests of faculty members. Core Course.

GEO 310  Environmental Earth Science  3 cr
A spatial perspective on major global environmental problems. Topics include population pressure; loss of biodiversity; ozone depletion; global warming; water, energy, and mineral resources, food supplies, waste disposal, geologic hazards, and political/economic forces (identical to GY 310).
Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D) or GEO 101 Minimum Grade of D or GEO 102 Minimum Grade of D.

GEO 312  World Economic Geog  3 cr
Emphasis is placed on the location, spatial distribution, and spatial interaction of economic activities within a global context. Topics covered include population, natural resources, primary, secondary and tertiary activities, development and international trade and aid. Students will write technical reports using word processing and spreadsheet software.
Pre-requisite: GEO 114 Minimum Grade of D and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of D).

GEO 313  Geography of U.S. and Canada  3 cr
An analysis of the environmental, historical, cultural, and economic factors that create the spatial patterns, development processes and distinctiveness of Canada and the United States.

GEO 314  Geography of Europe  3 cr
An analysis of the environmental, historical, social and economic factors that create the diversity of countries and their unique spatial characteristics on the subcontinent of Europe.

GEO 315  Geography of Latin America  3 cr
A systematic survey of Latin America landscapes. Attention is directed to natural resources, human activities and regional differentiation.
Pre-requisite: GEO 101 Minimum Grade of D or GEO 102 Minimum Grade of D or GEO 114 Minimum Grade of D or GEO 115 Minimum Grade of D.

GEO 317  Mountain Geography  3 cr
This course studies the mountainous regions of the world from a regional geography perspective. Course topics will include both physical and cultural aspects: their origins, historic attitudes towards mountains, the sacred mountains, their physical features, population and human occupation, climates, biota, and current threats to mountain environments. We will study the role of human activity in affecting mountain environments as well as the effect of mountains on people.
Pre-requisite: EH 102 Minimum Grade of C.

GEO 320  Alabama Geography  3 cr
Spatial study of physical and human features in Alabama. Includes geomorphology, climate, vegetation, agriculture, development, population, and environmental issues within the state.
Pre-requisite: (GEO 101 Minimum Grade of D or GEO 102 Minimum Grade of D or GEO 114 Minimum Grade of D or GEO 115 Minimum Grade of D) and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D).

GEO 321  Nat'l Parks Conservation  3 cr
An analysis of the motives and processes for establishing national parks and nature reserves, the primary conservation and preservation issues they have and the influences of ecology, politics, and culture on their planning and management. U.S. national parks are emphasized.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of D) and (GEO 101 Minimum Grade of D or GEO 102 Minimum Grade of D or GEO 114 Minimum Grade of D or GEO 115 Minimum Grade of D).

GEO 331  Computer Graphs and Maps  4 cr
Introductory review of the application of computers to the production of graphs and thematic maps for geographical analysis. Core course. Meets computer proficiency requirement for Geography majors. Fee.
Pre-requisite: GEO 102 Minimum Grade of C and GEO 102L Minimum Grade of C.

GEO 332  Remote Sensing I  4 cr
Interpretation of maps, air photos and satellite images (identical to GY 332). Fee. Core course.
Pre-requisite: GEO 102 Minimum Grade of C and GEO 102L Minimum Grade of C. GEO 102 and GEO 102L can be taken concurrently with this course.

GEO 365  Urban Geography and Planning  3 cr
Concentrates upon the evolution and function of the urban spatial system, and upon the internal spatial structure of an urban area's residential, commercial, and industrial land use. This course also introduces basic concepts and strategies of urban and regional planning with a focus on the domestic realm.
Pre-requisite: GEO 114 Minimum Grade of D or GEO 115 Minimum Grade of D.
GEO 370  International Tourism  3 cr
The study of the components of the Tourism industry, their spatial distribution, the environmental and cultural effects of Tourism, and the requisites and techniques for planning tourism development.
Pre-requisite: (GEO 101 Minimum Grade of D or GEO 102 Minimum Grade of D or GEO 114 Minimum Grade of D or GEO 115 Minimum Grade of D).

GEO 405  Natural Hazards and Disasters  3 cr
An overview of natural hazards and disasters from a scientific perspective that focuses on the occurrence and impact of environmental hazards, such as volcanoes, earthquakes, tsunamis, floods, mass movements, and coastal hazards. Mitigation techniques used to make the human environment more resilient against natural hazards are also covered. In addition, the viewpoint of hazard and emergency managers toward natural disasters will be studied.
Pre-requisite: GEO 102 Minimum Grade of C or (GY 101 Minimum Grade of C or GY 111 Minimum Grade of C).

GEO 410  Biogeography  3 cr
Analysis of spatial patterns of life on earth. Biogeography emphasizes the influence of the physical environment, paleogeography, and past and possible future climate change on the biomes and biogeographic realms.
Pre-requisite: GEO 101 Minimum Grade of D.

GEO 411  Soils  3 cr
A review of soil formation, processes and properties (identical to FY 411).
Pre-requisite: GEO 102 Minimum Grade of D.

GEO 412  Physiograph Regions N Amer-W  3 cr
The study of the major and minor natural regions of the North American continent, from Alaska to the Mexican border, including the Caribbean area. The course will focus on the different physically defined regions of North America, studying the homogenous variables that make each region distinct, including the topography, vegetation, soils, surface features, and past climates.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (GEO 102 Minimum Grade of C and GEO 102L Minimum Grade of C) or (GY 101 Minimum Grade of C or GY 111 Minimum Grade of C) and (GY 111L Minimum Grade of C).

GEO 417  Health and Place  3 cr
This course illustrates how geographic concepts help us better understand health and well-being, through the exploration of theories, methodologies, and contributions of medical geography to the social and health sciences. Using spatial tools, such as mapping and Geographic Information Systems, this course will examine the geographical patterns of health and disease. This course encourages students to examine the theoretical and technological tools geography brings to topics related to health and provides them with a foundation for studying geographic differences in health and health services.
Pre-requisite: EH 102 Minimum Grade of C.

GEO 435  Research Methods Geography  3 cr
This course serves as an introduction to geography as a research discipline. Emphasis is placed on geographic problem solving, data collection, data analysis, and reporting. Micro computer oriented statistical and mapping packages will be used to analyze geographic data.
Prerequisites: Junior standing. Core course. Fee.
Pre-requisite: ST 210 Minimum Grade of D. ST 210 can be taken concurrently with this course.

GEO 440  Coastal Zone Management  2 cr
A review of ecological features and management policies for coastal communities with a description of relevant federal and state programs. Taught only at Dauphin Island Sea Lab.

GEO 441  Coastal Climatology  2 cr
Study of the controlling factors and features of the world's climates, with particular attention to coastal areas, and application and interpretation of climate data. Taught only at Dauphin Island Sea Lab.

GEO 443  Climatology-W  3 cr
Analysis of global climate as aggregate weather. Component elements, factors controlling distribution, resulting area patterns, and climatic classification are studied (identical to MET 443). Fee.
Pre-requisite: MET 140 Minimum Grade of C or GEO 101 Minimum Grade of C.

GEO 475  Field Work in Geography  1 TO 6 cr
Students will travel to pre-determined location to perform field work for a project that was pre-determined by the professor and student. Once in the field, students will gather data and learn about the landscape(s).
Pre-requisite: EH 102 Minimum Grade of D.

GEO 485  Seminar in Geographic Thought  3 cr
This course serves as the capstone course for geography majors in which students integrate their knowledge of human and physical geography, as well as the geographic techniques, to investigate real-world problems with a spatial component. Students gain experience in working in small groups and in written and oral presentation of project results. Students will also lead discussions on key or pertinent research articles in geography. Taught Spring only.
Pre-requisite: GEO 435 and GEO 331 and GEO 332.

GEO 490  Special Topics  2 TO 4 cr
Geographic topics not covered in current geography courses. May be repeated when content varies for a maximum of 8 credit hours.

GEO 492  Seminar -  1 TO 3 cr
Departmental seminar investigating a selected field of geography. May be repeated when content varies for a maximum of 3 credit hours.

GEO 494  Directed Studies  1 TO 4 cr
Independent research under the direction of a member of the geography faculty. No more than 8 hours of Directed Studies is allowed.
GEO 496  Internship in Geography  1 TO 4 cr
On-the-job learning through occupational or professional work with an approved firm or agency. Open to geography majors only. No more than 4 hours of Internship credit is allowed.

GEO 590  Sp Top -  1 TO 6 cr
An in-depth course for advanced students in geography. Topics and titles will be selected to examine the subject matter in an area of current interest to students and in an area of particular faculty expertise. Includes specialized topics not currently listed in the Bulletin course offerings.

GEO 594  Grad Dir Study in Geography-  1 TO 4 cr
Independent research in Geography at the graduate level. May be used to learn new techniques or explore research questions of special interest under the direction of a member of the Geography graduate faculty.

Geology (GY)

GY 111L  Physical Geology Lab  1 cr
Laboratory course for Physical Geology. Fee.
Co-requisite: GY 111

GY 112L  Earth History Lab  1 cr
Laboratory course for Earth History.
Co-requisite: GY 112
Pre-requisite: GY 111 Minimum Grade of D and GY 111L Minimum Grade of D.

GY 111  Physical Geology  3 cr
Materials that make up the Earth as well as the properties and geological processes that operate in the Earth. Special topics include plate tectonics, mineral chemistry, the rock cycle, sedimentary processes, metamorphism and geological map reading. Core course.
Co-requisite: GY 111L

GY 112  Earth History  3 cr
The origin and history of the earth as seen in the rocks and their contained life record. Core Course.
Co-requisite: GY 112L

GY 113  Honors Geoscience Field - H  3 cr
A two-week field course emphasizing the recognition and understanding of geologic processes in the field environment. The course is based in the Taos Ski Valley, New Mexico, with field trips ranging across northern New Mexico and southern Colorado during the interim session. Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D and GY 111L Minimum Grade of S) and (GY 103 Minimum Grade of D or GY 112 Minimum Grade of D and GY 112L Minimum Grade of S).

GY 301  Geomorphology  3 cr
Principles of landform development as it relates to specific processes (fluvial erosion, glacial erosion, etc.), construction of topographic base maps with Alidade/Total Station, GPS navigation and surveying, and rock/mineral resource evaluation. Fee.
Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D).

GY 302  Crystallography and Mineralogy  4 cr
Introduction to elementary crystallography, crystal chemistry, and atomic structure of minerals, as well as the identification, characterization and use of common rock-forming minerals and important ore minerals. Fee.
Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D and GY 111L Minimum Grade of D) and (GY 103 Minimum Grade of D or GY 112 Minimum Grade of D and GY 112L Minimum Grade of D) and (CH 131 Minimum Grade of D or CH 115 Minimum Grade of D). CH 131 can be taken concurrently with this course.

GY 303  Igneous & Meta Petrology  4 cr
The study of the formation and classification of igneous and metamorphic rocks. Fee.
Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D) and (GY 232 Minimum Grade of D or GY 302 Minimum Grade of D or GY 342 Minimum Grade of D).

GY 304  Stratigraphy - W  3 cr
The development of the stratigraphic column; correlation and field procedures. Fee.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (GY 103 Minimum Grade of D or GY 112 Minimum Grade of D). EH 102 can be taken concurrently with this course.

GY 305  Geophysics  4 cr
Application of classical physics to the study of the Earth and the solution of problems in Earth sciences, including analysis of seismic refraction and reflection surveys, earthquakes, gravity and magnetic fields, and electrical geophysical surveys. Fee.
Pre-requisite: GY 111 Minimum Grade of D and GY 301 Minimum Grade of D.

GY 306  Sedimentology-W  3 cr
Study the principles pertaining to the description and classification of sedimentary rocks, with emphasis on sedimentary processes and depositional environments. Pre-requisite: GY 111 Minimum Grade of D and GY 111L Minimum Grade of D and GY 112 Minimum Grade of D and EH 102 Minimum Grade of D or EH 105 Minimum Grade of D.

southalabama.edu/bulletin  2019-20 GRADUATE/UNDERGRADUATE BULLETIN
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>GY 310</td>
<td>Environmental Earth Science</td>
<td>3 cr</td>
<td>A spatial perspective on major global environmental problems. Topics include population pressure, loss of biodiversity, ozone depletion, global warming, water, energy and mineral resources, food supplies, waste disposal, geological hazards and political/economic forces (identical to GEO 310). Pre-requisite: GY 111 Minimum Grade of D or GEO 101 Minimum Grade of D or GEO 102 Minimum Grade of D.</td>
</tr>
<tr>
<td>GY 332</td>
<td>Remote Sensing I</td>
<td>4 cr</td>
<td>Interpretation of maps, air photos and satellite images (identical to GEO 332). Fee. Pre-requisite: GEO 102 Minimum Grade of C and GEO 102L Minimum Grade of C and GY 301 Minimum Grade of C. GEO 102 and GEO 102L can be taken concurrently with this course.</td>
</tr>
<tr>
<td>GY 401</td>
<td>Paleontology</td>
<td>3 cr</td>
<td>Major invertebrate fossil groups, their identification, and their geologic distribution. Fee. Pre-requisite: (GY 103 Minimum Grade of D or (GY 112 Minimum Grade of D and GY 112L Minimum Grade of D)).</td>
</tr>
<tr>
<td>GY 403</td>
<td>Structural Geology</td>
<td>4 cr</td>
<td>Study of the deformation of the internal Earth and the structures that result. Fee. Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D and GY 301 Minimum Grade of D) and (GY 325 Minimum Grade of D) and (PH 112 Minimum Grade of D or PH 114 Minimum Grade of D) or (PH 201 Minimum Grade of D or PH 216 Minimum Grade of D)).</td>
</tr>
<tr>
<td>GY 411</td>
<td>Soils</td>
<td>3 cr</td>
<td>A review of soil formation, processes and properties (identical to GEO 411). Pre-requisite: (GEO 102 Minimum Grade of D and GEO 102L Minimum Grade of D and GEO 301 Minimum Grade of D).</td>
</tr>
<tr>
<td>GY 413</td>
<td>Coastal Geomorphology</td>
<td>2 cr</td>
<td>An introduction to coastal sediment processes and their applied coastal geomorphology with emphasis on waves, tides, sediments, and their interactions including the impacts of anthropogenic influences. Taught only at Dauphin Island Sea Lab.</td>
</tr>
<tr>
<td>GY 420</td>
<td>Geostatistics</td>
<td>3 cr</td>
<td>Applied bivariate and multivariate statistics to problems in Geography, Geology, and Meteorology; parametric and non-parametric procedures in correlation, regression, analysis of variance, etc. Time series analysis, trend surface analysis, kriging and analysis of spatial (map) data. Identical to GEO 420. Fee. Pre-requisite: (GY 111 Minimum Grade of C and GY 112 Minimum Grade of C) and (MA 112 Minimum Grade of C or ST 210 Minimum Grade of C).</td>
</tr>
<tr>
<td>GY 421</td>
<td>Applied Environ Geology - W</td>
<td>3 cr</td>
<td>A geological applications course designed to familiarize students with techniques used by environmental and engineering geologists in their studies of land use, land development and assessment of geological hazards. Material is illustrated with case studies from the Mobile area. Fee. Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
</tr>
<tr>
<td>GY 422</td>
<td>Sedimentary Geology</td>
<td>3 cr</td>
<td>A course examining sedimentation with emphasis on environments of deposition, sea-level and other controls on sedimentation in the rock record, and petroleum exploration. Credit for both GY 422 and GY 522 will not be allowed. Fee. Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D) and (GY 103 Minimum Grade of D or GY 112 Minimum Grade of D).</td>
</tr>
<tr>
<td>GY 425</td>
<td>Hydrology</td>
<td>4 cr</td>
<td>Principles of sources, occurrences, and movement of groundwater. Surface and subsurface investigations of groundwater and elementary groundwater hydrology and chemistry. Credit for both GY 425 and GY 525 will not be allowed. Fee.</td>
</tr>
<tr>
<td>GY 426</td>
<td>Contaminant Hydrogeology</td>
<td>3 cr</td>
<td>Flow systems, mass transport in the vadose and saturated zones; advection and dispersion; transformation, retardation and attenuation of solutes; low temperature geochemical processes and kinetics of chemical reactions; contaminant modeling using finite difference-finite element methods. Credit for both GY 426 and GY 526 will not be allowed. Fee. Pre-requisite: (GY 425 Minimum Grade of D or GY 475 Minimum Grade of D).</td>
</tr>
<tr>
<td>GY 433</td>
<td>X-Ray Analytical Methods</td>
<td>4 cr</td>
<td>Theory and use of x-ray diffraction systems as applied to crystallography, mineralogy, chemistry, and metallurgy. Fee. Pre-requisite: GY 302 Minimum Grade of D.</td>
</tr>
<tr>
<td>GY 446</td>
<td>Marine Geology</td>
<td>4 cr</td>
<td>A study of the geology of the ocean basins, with special emphasis on the continental shelves, their sediments, and sedimentary processes at work there. Pre-requisite: (GY 101 Minimum Grade of D or GY 111 Minimum Grade of D) and (GY 103 Minimum Grade of D or GY 112 Minimum Grade of D).</td>
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<tr>
<td>GY 450</td>
<td>Thin-Section Techniques</td>
<td>1 cr</td>
<td>A laboratory based course illustrating techniques employed by geologists to prepare thin-sections from geological materials. Students will produce thin-sections and write up reports detailing the petrography of the samples examined. Fee. Pre-requisite: (GY 232 Minimum Grade of D or GY 302 Minimum Grade of D or GY 342 Minimum Grade of D) and (GY 233 Minimum Grade of D or GY 303 Minimum Grade of D or GY 343 Minimum Grade of D) and (GY 344 Minimum Grade of D or GY 402 Minimum Grade of D). GY 402 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>GY 480</td>
<td>Field Geology</td>
<td>6 cr</td>
<td>A six-week, summer field course on the methods of geologic surveying, the nature and construction of geologic maps and cross-sections, measurements of stratigraphic sections and preparation of geologic reports. This course serves as a capstone class for geology majors. Pre-requisite: (GY 303 Minimum Grade of D and GY 403 Minimum Grade of D and GY 402 Minimum Grade of D and HS 170 Minimum Grade of P).</td>
</tr>
<tr>
<td>GY 490</td>
<td>Special Topics</td>
<td>1 TO 4 cr</td>
<td>Geological topics not covered in current geology courses. Prerequisite: Junior or Senior standing.</td>
</tr>
<tr>
<td>GY 492</td>
<td>Seminar -</td>
<td>1 TO 3 cr</td>
<td>Departmental seminar investigating a selected field of geology (topic announced prior to registration). May be repeated when content varies for a maximum of 3 credits.</td>
</tr>
<tr>
<td>GY 494</td>
<td>Directed Studies</td>
<td>1 TO 4 cr</td>
<td>Independent research in the field or laboratory under the direction of a member of the Geology faculty. Students must have an acceptable project approved before registering for this course. Prerequisite: Permission of the Chair, Junior or Senior standing. No more than 8 hours of directed study is allowed.</td>
</tr>
<tr>
<td>GY 496</td>
<td>Internship in Geology</td>
<td>1 TO 3 cr</td>
<td>On-the-job training through occupational or professional work through an approved geological organization. Only open to geology majors. Prerequisite: Permission of chair; Junior or Senior standing. No more than 3 hours of internship is allowed.</td>
</tr>
<tr>
<td>GY 520</td>
<td>Geostatistics</td>
<td>4 cr</td>
<td>Applied bivariate and multivariate statistics to problems in Geography, Geology, and Meteorology; parametric and non-parametric procedures in correlation, regression, analysis of variance, etc. Time series analysis, trend surface analysis, kriging and analysis of spatial (map) data. Identical to GEO/GEY 420. Credit for both GY 420 and GY 520 will not be allowed. Pre-requisite: (ST 175 Minimum Grade of B or ST 210 Minimum Grade of B) or (MA 125 Minimum Grade of C or MA 132 Minimum Grade of C).</td>
</tr>
<tr>
<td>GY 531</td>
<td>Optical Mineralogy-Crystallogr</td>
<td>4 cr</td>
<td>Theory and use of the petrographic microscope in the recognition and identification of crystallographic and optical properties in non-opaque minerals. Graduate credit will require an additional project specified by the instructor. Fee. Pre-requisite: (GY 232 Minimum Grade of D or GY 302 Minimum Grade of D or GY 342 Minimum Grade of D).</td>
</tr>
<tr>
<td>GY 533</td>
<td>X-Ray Analytical Methods</td>
<td>4 cr</td>
<td>Theory and use of x-ray diffraction systems as applied to crystallography, mineralogy, chemistry, and metallurgy. Pre-requisite: (GY 231 Minimum Grade of D or GY 341 Minimum Grade of D).</td>
</tr>
<tr>
<td>GY 544</td>
<td>Sedimentary Geology</td>
<td>3 cr</td>
<td>A study examining sedimentation with emphasis on environments of deposition, sea-level and other controls on sedimentation in the rock record, and petroleum exploration. Credit for both GY 444 and GY 544 will not be allowed. Pre-requisite: MAS 603 Minimum Grade of C or GY 344 Minimum Grade of D.</td>
</tr>
<tr>
<td>GY 557</td>
<td>Hydrology</td>
<td>4 cr</td>
<td>Principles of sources, occurrences, and movement of ground water. Surface and sub-surface investigations of ground water and elementary ground water hydrology and chemistry. Pre-requisite: (GY 232 Minimum Grade of D or GY 342 Minimum Grade of D).</td>
</tr>
<tr>
<td>GY 576</td>
<td>Contaminant Hydrogeology</td>
<td>4 cr</td>
<td>Flow systems, mass transport in the vadose and saturated zones; advection and dispersion; transformation, retardation and attenuation of solutes; low temperature geochemical processes and kinetics of chemical reactions; contaminant modeling using finite difference-finite element methods. Credit for both GY 426 and GY 576 will not be allowed. Pre-requisite: GY 425 Minimum Grade of D or GY 475 Minimum Grade of D or GY 575 Minimum Grade of D.</td>
</tr>
<tr>
<td>GY 590</td>
<td>Sp Top -</td>
<td>1 TO 6 cr</td>
<td>An in-depth course for advanced students in geology. Topics and titles will be selected to examine the subject matter in an area of current interest to students and in an area of particular faculty expertise. To include specializing topics not currently listed in Bulletin course offerings.</td>
</tr>
<tr>
<td>GY 592</td>
<td>Seminar -</td>
<td>1 TO 6 cr</td>
<td>Students and faculty meet weekly in an interactive discussion of current literature in geological sciences. The focus will be on 'state of the art' theories and methodologies as they occur in the primary literature. Student presentation is required to receive credit.</td>
</tr>
<tr>
<td>GY 594</td>
<td>Directed Research</td>
<td>1 TO 6 cr</td>
<td>Independent research under the direction of a member of the graduate faculty. May be used to learn new techniques or to explore research questions of special interest. A maximum of 6 hours may be earned for this course.</td>
</tr>
</tbody>
</table>
Gerontology (GRN)

GRN 272 Gender and Aging 3 cr
This course examines the dynamics of gender and aging within society from an interdisciplinary perspective. Students will be introduced to controversies in gender over the life course. These include, but are not limited to, definitions and cultural boundaries, gender in childhood, gender and relationships, gender in education and the workplace, gender and sexuality, as well as gender in late life.

GRN 290 Special Topics 3 cr
This designation is used for interdisciplinary courses on aging on a variety of subjects. This course does not replace any course in a single discipline. May be repeated as long as the topic changes, to maximum of six semester hours.

GRN 435 Health Disparities Life Span 3 cr
This course examines differences in health status across the life span. The course will focus heavily on racial/ethnic and socioeconomic disparities in health applying a social determinants' of health framework. Issues that will be considered include how income, education, neighborhood conditions, access to health care, and other community factors shape opportunities to be healthy. This course is cross-listed as SY 435 and GRN 435 and has been approved as an elective for the Undergraduate Certificate in Gerontology and the interdisciplinary minor in Gerontology. Pre-requisite: SY 109 Minimum Grade of D.

GRN 490 Special Topics 3 cr
This course is designated for upper division students and graduate students, particularly those pursuing studies for the Certificate of Gerontology. The course content focuses on interdisciplinary treatments on various topics on aging. This course does not replace any course in a single discipline. (Examples of special topics: Trends and Issues in Gerontology; Leadership and Advocacy in Gerontology; Housing and Lifestyle Changes over the Life Course). May be repeated as long as the topic changes, to maximum of six semester hours. Pre-requisite: SY 372 Minimum Grade of D.

GRN 494 Directed Studies 1 TO 3 cr
Under the guidance of a faculty member, the student will pursue directed research on readings of an approved topic in Gerontology. May be repeated as long as the topic changes, to a maximum of six semester hours. Requires permission of Director of Gerontology. Pre-requisite: SY 372 Minimum Grade of D.

GRN 496 Internship - Gerontology 3 OR 6 cr
This course is to provide a practicum experience in gerontology in a setting selected by the student and approved by the Program Director. The course emphasis is on the experiential learning process and outcomes. The undergraduate student will apply theoretical concepts in specific areas of interest related to aging and intergenerational relations. Interns will meet as a group three times during the semester for orientation, professional development, and evaluation activities. The 3-hour internship requires 100 contact hours; the 6-hour internship requires 200 hours. Permission of Director of Gerontology is required. Fee. Pre-requisite: SY 372 Minimum Grade of C.

GRN 535 Health Disparities Life Span 3 cr
The main purpose of this seminar is to provide students with an understanding of how social factors contribute to racial/ethnic, socioeconomic and gender disparities in health and health care. We will examine how dyadic relationships such as interpersonal forms of discrimination, marriage, and social ties may contribute to health disparities. We will also examine the ways in which neighborhood and community context, as well as inequalities in socioeconomic status materially shape health and access to health care services. The course is cross-listed as GRN 435/535 and SY 435/535 and has been approved as an elective for the Undergraduate/Graduate Certificate in Gerontology and the interdisciplinary minor in Gerontology. Pre-requisite: SY 372 Minimum Grade of C.

GRN 594 Dir St in Gerontology 1 TO 3 cr
Under the guidance of a faculty member, the student will pursue directed research or readings of an approved topic in Gerontology. May be repeated as long as the topic changes, to maximum of six credit hours. Requires permission of the Director of Gerontology.

GRN 596 Internship - Gerontology 3 OR 6 cr
This course is to provide a practicum experience in gerontology in a setting selected by the student and approved by the Program Director. The course emphasis is on the experiential learning process and outcomes. The graduate student will apply theoretical concepts to leadership roles, conducting research and influencing social and health care policies related to aging and intergenerational relationships. Interns will meet as a group three times during the semester for orientation, professional development, and evaluation activities. The 3-hour internship requires 100 contact hours; the 6-hour internship requires 200 hours. Permission of Director of Gerontology is required. Fee. Pre-requisite: SY 523 Minimum Grade of B.
GRN 597  GRN Teaching Apprenticeship 1 TO 3 cr
Directed Studies/Apprenticeship that focuses on teaching Gerontology. The student will work directly with a member of the Gerontology graduate faculty to learn pedagogy, innovation in teaching, and course content that will equip the student for future teaching assignments. Many PhD programs offer both Teaching Assistantships and Research Assistantships. Gerontology students need to show evidence that they have had some teaching-related experience to compete strongly for the TA position. This course is also appropriate for students who anticipate careers in teaching within the field of Gerontology (aging or intergenerational studies). Arrangements must be made prior to registration. Permission of the Program Director is required.
Pre-requisite: SY 372 Minimum Grade of C.

Grad Interdisciplinary Studies (GIS)

GIS 501  Responsible Conduct of Research 1 cr
This course is designed to expose future professionals to a variety of topics concerning Responsible Conduct in Research including issues concerning Research Integrity as well as standards and policies affecting research and life in Academia. The weekly sessions include lectures, open discussions, and analyses of case studies.

GIS 502  Technology Commercialization 0 TO 3 cr
This course will teach the National Science Foundation I-Corps curriculum of Lean Launch and Business Model canvas. It delivers best practices for innovative, team-based entrepreneurship in a semester-long format that provides real-world, hands-on learning experiences in how to successfully transfer knowledge into products and processes that benefit society. Significant time will be devoted outside the classroom to testing hypotheses on each part of the team’s business hypothesis and potential customers and partners. Typically, graduates of this curriculum increase their chance of winning a grant from 17% to 60%, a greater than three-fold increase in the odds of success.

Health Informatics (HI)

HI 300  Health Info Clinical Environment 3 cr
This course provides an overview of concepts, terms, organization, and processes associated with patient care and clinical environments as they pertain to health informatics. The entire process of how a person accesses, moves within, and exits the system both as inpatient and outpatient to obtain care. Students will observe and report on a variety of clinical settings and healthcare specializations throughout the semester. This course is designed for students with no prior clinical experience.

HI 410  Health Informatics 3 cr
This course provides an overview of the concepts, terms, tools, and architectures associated with health informatics as applied to healthcare delivery. Topics include: electronic record systems, computerized physician order entry, health system standards, terminologies, workflow modeling, security and privacy of clinical data, clinical reporting, and the impact of information technology use on the quality and efficiency of health care delivery and outcomes.

HI 450  Health Data Secur/Compliance 3 cr
This course involves a thorough examination of the security and privacy requirements of the Health Insurance Portability and Accountability Act (HIPAA) and the implementation of these requirements in the clinical environment. Students will learn how to address security issues from system development all the way through post-implementation, how to evaluate systems for vulnerabilities, and how to identify protected health information and covered entities. Pre-requisite: ISC 300 Minimum Grade of C or HI 300 Minimum Grade of C and (ISC 410 Minimum Grade of C or HI 410 Minimum Grade of C).

HI 455  Hlth Data Mgt & Decision Supp 3 cr
This course focuses on the design and management of electronic medical record systems and clinical decision support systems. Course content related to electronic medical record systems includes architectural components, technical design issues, and management; and, content related to clinical decision support systems includes decision support roles, extracting useful information from data, and legal and regulatory restrictions. Laboratory assignments will provide students with opportunities to interact with these systems. Prerequisites: HI 300 or ISC 300 and HI 410 or ISC 410. Pre-requisite: ISC 300 Minimum Grade of C or HI 300 Minimum Grade of C and ISC 410 Minimum Grade of C or HI 410 Minimum Grade of C.

HI 550  Health Data Secur/Compliance 3 cr
This course involves a thorough examination of the security and privacy requirements of the Health Insurance Portability and Accountability Act (HIPAA) and the implementation of these requirements in the clinical environment. Students will learn how to address security issues from system development all the way through post-implementation, how to evaluate systems for vulnerabilities, and how to identify protected health information and covered entities.

HI 555  Hlth Data Mgt & Decision Supp 3 cr
This course focuses on the design and management of electronic medical record systems and clinical decision support systems. Course content related to electronic medical record systems includes architectural components, technical design issues, and management; and, content related to clinical decision support systems includes decision support roles, extracting useful information from data, and legal and regulatory restrictions. Laboratory assignments will provide students with opportunities to interact with these systems.
Health Sciences (HSC)

HSC 101  Interprofessional Freshman Sem  2 cr
The purpose of this course is to introduce the unique requirements and opportunities of the Health Sciences Division to beginning students who have declared or are considering a Health Science major (Nursing, Medicine, Pharmacy, Allied Health Professions, etc.). The course focuses on the value of higher education as a base for a career in Health Sciences and develops an awareness of activities and support services available within the University to enhance student success. Academic rules, regulations and policies related to admission, progression, and graduation in the University and Colleges of Nursing, Medicine, and Allied Health Professions are discussed.

HSC 342  Administration of Medication  1 cr
The purpose of this course is to prepare the student to accurately calculate medication dosages. Mathematical and metric apothecary concepts are stressed.

HSC 343  Clinical Pharmacology  3 cr
The purpose of the course is to provide the student with the opportunity to acquire information related to the clinical application of drug therapy and the concepts relating to the mechanisms of drug actions, interactions and adverse reactions, including the immunologic-idsosyncratic-allergic responses. Emphasis is on the current evidence related to pharmacokinetics, dosage, methods of administration, and adverse effects of major classifications of drugs to inform nursing care. Prerequisites: Admission to Professional Component or special permission of instructor. Pre-requisite: (NU 311 and NU 325 ). NU 311 and NU 325 can be taken concurrently with this course.

HSC 390  Special Topics -  1 TO 9 cr
Selected topics in Health Sciences. Requires special permission. Variable title and 1 to 9 variable credit hours.

HSC 424  Issues in EOL & Palliative Cr  2 cr
This course provides the student an opportunity to analyze theories, concepts, socio-ethical issues, and research related to end of life and palliative care. The focus is on assisting students to explore their perspectives regarding end of life and palliative care as well as developing self-awareness of the perspectives of patients and families across the socio-cultural spectrum. Emphasis is on the acceptance of the process of mourning and death as a part of life and applicable appropriate evidence-based health care interventions.

HSC 425  Issues in Health Nutrition  2 cr
This elective course focuses on the impact of nutritional issues on health at the national/international level. The intent is to provide the Health Sciences Student with opportunity to develop comprehension of issues on a national or global scale and apply to professional health care practice with individuals and communities.

HSC 571  Managing Health Care Personnel  3 cr
The purpose of this course is to analyze frameworks for managing health care personnel. The course focuses on exploration and application of human resource management. Emphasis within the course is placed on leadership, communication, relationship management diversity, legal and ethical principles, workforce planning and maintenance.

HSC 590  Special Topics  1 TO 6 cr
Study of topics significant to the health professions. Content varies and may be repeated.

HSC 595  Evidence Basd Lipid Practice  2 cr
This course serves as a foundational course in the Clinical Lipidology Subspecialty program. The purpose of this didactic course is to prepare the Clinical Lipid Specialist student to evaluate CVD epidemiology, cardiometabolic risk, and evidence based lipid practice in those with selected health care needs across the lifespan.

HSC 596  Adv Vascular Biology  2 cr
This course serves as a foundational course in the Clinical Lipidology Subspecialty program. The purpose of this didactic course is to prepare the Clinical Lipid Specialist student to evaluate lipoprotein metabolism and vascular biology in those with selected health care needs across the lifespan.

HSC 597  Adv Pharm Complex Dyslipiderni  2 cr
This course serves as a foundational course in the Clinical Lipidology Subspecialty program. The purpose of this didactic course is to prepare the Clinical Lipid Specialist student to evaluate advanced pharmacologic options in treating those with selected health care needs across the lifespan.

HSC 598  Diag/Mgt C-plex Dyslipidernia  2 cr
This course serves as a final course in the Clinical Lipidology Subspecialty program. The purpose of this didactic course is to prepare the Clinical Lipid Specialist student to evaluate and manage complex dyslipidemia in those with selected health care needs across the lifespan.
HSC 601 Intro to Interprofessional Ed  1 cr
The purpose of this course is to introduce nursing students and occupational therapy students to the concepts of interprofessional education. Students will gain an understanding of their own role in healthcare as well as the scope of the role of another health profession. Students will learn how to function in an interprofessional team and carry this knowledge, skill, and value into their future practice, ultimately providing interprofessional patient care as part of a collaborative team that is focused on improving patient outcomes. Interprofessional teams are composed of members from different health professions who have specialized knowledge, skills, and abilities with the goal of providing patient-centered care in a collaborative manner. The team establishes a common goal and using their individual expertise, and works in concert to achieve patient-centered care. In this model, joint decision making is valued and each team member is empowered. Students will be introduced to core competencies in interprofessional care and utilize Fennel's Four Phase Model for understanding and treating multiple chronic conditions for adults, elders, and returning veterans. Co-requisite: AHN 588

HSC 602 Team Building  1 cr
This online course will allow students to examine the specific impact of cultural, ethical, and religious factors on ethical health-care decision-making and focuses on the relationships among the professions, joint relationships with patients, the quality of cross-professional exchanges, and interprofessional considerations in health care delivery and in formulating public health policies, programs, and services. The focus of the course is derived from the approach utilized in the Core Competencies for Interprofessional Collaborative Practice (2011). Structured content introduces the topic and will allow teams of students to practice problem solving and ethical decision-making within an interprofessional team. Co-requisite: AHN 591 Pre-requisite: HSC 601 Minimum Grade of C.

HSC 603 Assmnt Vulnerable Populations  1 cr
This online interdisciplinary course will implement evidence based and collaborative models to assess the needs of vulnerable populations who have multiple physical needs such as those evidenced by adults, elders, and returning veterans with multiple chronic illnesses and/or acute injury. The student will synthesize, critique, and apply evidence to improve patient care outcomes. In this mentored and supervised experience, the student will work in groups with the faculty to complete an assessment of need in these populations. Co-requisite: AHN 595 Pre-requisite: HSC 602 Minimum Grade of C.

HSC 690 Special Topics-  1 TO 9 cr
Study of health professional topics at the doctoral level. Credit hours will vary based on student need and depth of course subject matter. Content will vary and may be repeated up to 9 credits. Requires special permission.

Health And Safety (HS)

HS 170 First Aid  1 cr
The scope, needs, and limitations of first aid with laboratory training in the techniques and methods of injury care. Opportunity for American Red Cross first aid and CPR certification.

HS 262 Personal Health  3 cr
Current health issues as related to the individual with emphasis on sociological, psychological, and economic factors.

HS 263 Nutrition and Hunger  3 cr
An introduction to digestion, absorption, transportation, and utilization of nutrients. Other topics include: nutrition across the life span, population dynamics, and world hunger.

HS 340 Health in the Sec Classroom  3 cr
A study of instructional practice and application in the secondary health classroom. Pre-requisite: Admission to teacher candidacy required. Co-requisite: HS 430

HS 351 Safety Education  3 cr
Traffic safety and safety at home, work, school, and play. Organization of safety education programs in the school and community. Methods and materials for teaching safety.

HS 352 Traffic Safety Education  3 cr
A survey of the highway transportation system and traffic problems designed to give the driver education teacher an opportunity to develop an understanding of the scope and background of the various agencies and systems involved in the management of vehicular traffic at the national, state, and local level.

HS 353 Driver Education I  3 cr
History, principles, problems and the inventory of skills in driver education.

HS 361 School Comm Health-Impl Curric  3 cr
Contemporary school health and public health issues. Epidemiological concepts and methods. Governmental and volunteer health agencies. Curriculum development based on epidemiological data. Incorporates reading into the curriculum.

HS 362 Drug Education  3 cr
A survey of substance abuse issues. Attention is given to specific drug classifications, use and abuse patterns, prevention, treatment, and future implications.
HS 363  Sports Nutrition - W  3 cr
Basic nutritional principles are covered. Includes assessment of individual and/or group diets. The course is designed to optimize sport performance and/or body composition.
Pre-requisite: HS 263 Minimum Grade of D and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

HS 365  HPE Curr/Methods-Elem Teachers  3 cr
The development and implementation of appropriate health and physical education curriculum for elementary teachers. Content knowledge and the application of methodological and assessment strategies are adapted for appropriate learning environments.

HS 429  School Lab Experiences-Health  0 TO 3 cr
Professional laboratory observation and participation in health settings at local public schools. Prerequisite: Admission to teacher candidacy.
Co-requisite: HS 460

HS 430  School Lab Exp- Health II  0 cr
Professional Laboratory observation and participation in classroom health settings at a local public schools. Requires Admission to Teacher Candidacy.
Co-requisite: HS 340

HS 451  Driver Education II  3 cr
Methods and techniques, teaching aids, teaching resources and materials, and program and curriculum construction. Practical experience in teaching students to drive.

HS 452  Simulation in Driver Education  3 cr
Simulation as an audio-visual instructional method and designed to complement and supplement other instructional techniques used in the driver education program to prepare individuals to function safely and effectively in today's traffic.

HS 453  Range-Lab Prog in Driver Ed  3 cr
An examination of the aims, objectives, and role of laboratory programs in driver education. Directed laboratory experiences will be provided.

HS 460  Methods in Health Ed - W  3 cr
Topic selection and teaching unit preparation. Presentation and classroom practice of teaching methodologies. Practical mini-teaching experiences in local schools. Field experiences required. HE (6-12) and PE (P-12) majors only. Prerequisite: Admission to teacher candidacy. Co-requisite: HS 429.
Co-requisite: HS 429

HS 462  Public Health  3 cr
A study of public health organizations and available community health resources, including the official and non-official health agencies at various levels. An examination of causative community factors in disease, community diagnosis of and programs to combat these conditions.

HS 463  Human Sexuality: Health Ed Per  3 cr
An exploration of human sexuality with implications for health education.

HS 473  Problems in Health Education  3 cr
Special problems are assigned to individuals and to groups of students.

HS 490  Sp Top -  3 cr
A varying content course treating several aspects of Health Education. May be repeated for credit when course content varies.

HS 494  Directed Studies  1 TO 3 cr
Directed research. No more than two directed studies can be counted toward the bachelor's degree and Class B certification. HPELS advisor approval required.

HS 510  Current Health Issues  3 cr
Identification, exploration, and definition of current health issues such as drug abuse, mental health, aging, death and dying, human sexuality, chronic and communicable diseases.

HS 520  Methods in Health Education  3 cr
Development, selection, and implementation of classroom teaching strategies and classroom techniques in the Health Sciences area.

HS 560  School Health Curriculum  3 cr
Designed to develop the prospective teacher's or the in-service teacher's competencies in curriculum planning and development applied to the health area.

HS 562  Drug Use and Abuse  3 cr
A study of the drug spectrum including legal and illegal drug use and abuse. Discussion of education and preventive strategies.

HS 563  Nutrition  3 cr
An in-depth study of educational concepts related to digestion, absorption, transportation and utilization of nutrients.

HS 565  Community Health  3 cr
An introductory course in Community Health. Includes a survey of contemporary health problems of both communities and schools. A review of school and community health programs.

HS 567  Aging and Health  3 cr
An overview of the normal aging process, including physical, psychological and social changes, myths, diseases, related community resources, and the team approach to meeting needs.
Higher Education (HED)

HED 501  Digital Leader  3 cr
This course will explore the role of digital media, including social media, in higher education administration.

HED 503  Higher Ed Finance  3 cr
This course will examine national, state and local economic factors and their impact upon budgeting and financial management work of higher education administrators/leaders.

HED 603  Current Probs Higher Education  3 cr
Analysis of current issues affecting higher education.

HED 611  Human Relations in Higher Edu  3 cr

HED 621  Program and Curriculum Develop  3 cr
Designed to assess and improve the student's level of competency in program development skills, instructional strategies, systems analysis, and change innovation.

HED 631  Sem Higher Ed Mgt Skills  3 cr
Designed to assess and improve the student's knowledge of decision making styles, problem-solving processes, leadership skills, implementation of organizational change, and physical environments which promote productivity, all in the context of higher education.

HED 701  Adv Org Theory for Higher Edu  3 cr
This course is designed to provide students with an in-depth exploration of organizational theories and models and organizational approaches in higher education. Topics covered include administrative structure and leadership, accountability and change.

HED 702  Higher Ed Finance  3 cr
This course is designed to provide students with an overview of finance in higher education. The overview will include the financial benefits of higher education, access and affordability issues, state and federal funding, price-setting, tuition discounting, merit aid, sources of revenue and expenditures, cost-cutting measures, budgeting and college athletics.

HED 703  Adv Leadership for Higher Ed  3 cr
This course is designed to provide students with an in-depth exploration of leadership theories and models. Students will create a personal knowledge base from which to create a plan to develop or revise a leadership perspective.

HED 704  Current Issues in Higher Ed  3 cr
This course offers an in-depth analysis of current issues in and challenges to higher education.

HED 707  Multicult/Org Ch in Higher Ed  3 cr
Students will examine the role of University leaders, at Universities and diverse student populations, and study strategies and organizational models relative to the solution of problems associated with the implementation of organizational diversity plans.

HED 732  Ethics and Law for Higher Ed  3 cr
An examination of ethical and legal issues present in higher education.

History (HY)

HY 101  HY of Western Civilization I  3 cr
History of humankind, emphasizing the development of the West to c. 1600 C.E. Topics may include Mesopotamia and Egypt, Ancient Greece and Rome, the origins of monotheistic religions, and medieval Europe, Core Course.

HY 102  HY of Western Civilization II  3 cr
History of humankind, emphasizing the rise of the West, from c. 1600 C.E. Topics may include the Enlightenment, the French Revolution, WWII, WWII and the Cold War. Core course. Note: History 101 and 102 are related courses but need not be taken in order.

HY 103  HY of Asian Civilization I  3 cr
A survey of traditional cultures, values, ideas, and institutions of East, South, Southeast Asia to 1800.

HY 104  HY of Asian Civilization II  3 cr
The responses of East, South, and Southeast Asia to the impact of Western challenges and their roles in the modern world. Economic and political structure; the emergence of China and Japan as major world political and economic powers.

HY 135  US History to 1877  3 cr
Survey of US History to 1877. Topics may include Native American societies, colonial societies, the American Revolution, slavery, the Civil War, and Reconstruction. Core course.

HY 136  US History since 1877  3 cr
Survey of US History from 1877. Topics may include Western frontiers and Native Americans, Progressive Era, immigration, the Great Depression and Civil Rights Movements. Core Course. Note: History 135 and 136 are related courses but need not be taken in order.

HY 190  Special Topics -  1 TO 3 cr
Special topics and their development, illustrating historical concepts. May be repeated twice for credit when content varies.

HY 215  Military Hist of US Civil War  3 cr
Examines the military aspects of the US Civil War, paying particular attention to strategy, tactics, technology, leadership, and minority participation.
HY 228 Latin America 3 cr
An introductory survey of Latin American history from the
time of European conquest to the present.

HY 283 Chinese Film 3 cr
This course will introduce students to major topics in
Chinese history, covering both ancient periods such as
the Three Kingdoms period, and twentieth-century events
such as the war with Japan and the Cultural Revolution.
Post-Tiananmen Chinese society will also be stressed.
Students will explore these themes through Chinese film
and literature, and will thus become familiar with major
directors, including Zhang Yimou and Jia Zhangke, and
writers such as Yu Hua.

HY 288 History of the Mass Media 3 cr
The role of journalism in American society from the
Revolution to the present. This course is equivalent to CA
288. Fee.

HY 290 Special Topics- 3 cr
Special topics and their development, illustrative historical
concepts. May be repeated twice for credit when content
varies.

HY 303 Warfare Society Modern World 3 cr
Examines the mutual interrelations between warfare and
society in western civilization since the 14th century.
Pre-requisite: HY 102 Minimum Grade of C.

HY 305 History of Military Thought-W 3 cr
An intellectual history of the place of armed conflict in
society from the Renaissance to the Nuclear Age.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105
Minimum Grade of C).

HY 310 Amer Environmental Hy-W 3 cr
A textual and discussion-based analysis of the role of the
environment in America's history from the Pre-Columbian
era through the present, this course considers the
interactions between human society and its surroundings
across North America. In particular, this course explores
the ideas, activities, technologies and institutions that
have influenced our national interaction with the natural
world. Conversely, we consider the degree to which the
environment has shaped our national institutions and
identity.
Pre-requisite: (EH 101 Minimum Grade of C or EH 110
Minimum Grade of D or EH 190 Minimum Grade of D or
USA 010 Minimum Grade of S) and (EH 102 Minimum
Grade of C or EH 105 Minimum Grade of C).

HY 312 America in the 1960s 3 cr
This course covers American history during the 1960 s. It
will offer an overview of one of the most tumultuous periods
in modern American history.

HY 321 The Caribbean 3 cr
Explores the history of the island Caribbean from the onset
of European rule to the present.

HY 323 Central America 3 cr
Explores the history of Central America from Spanish
conquest to the present.

HY 325 Mexico 3 cr
Surveys the history of Mexico from Spanish conquest to the
present day.

HY 326 Brazil 3 cr
Surveys the history of Brazil from Portuguese conquest to
the present.

HY 331 History of England to 1603 3 cr
The history of England from the Roman occupation to the
Age of the Tudors. Identical with REL 331. Credit cannot be
received for both HY 331 and REL 331.

HY 332 Great Britain 1603 to 1815 3 cr
Great Britain from the accession of James I to the defeat of
Napoleon.

HY 333 Great Britain Since 1815 3 cr
The British at home and abroad; Constitution and culture,
identity and empire, since Waterloo.

HY 334 Modern Ireland 3 cr
The history of Ireland from the early 1600's; themes include:
domestic history, national identities, relations with England,
the independence movement, and the Troubles.

HY 335 History of Modern France 3 cr
France since the Revolution.

HY 336 Germany since 1848 3 cr
Germany from the era of liberalism and nationalism to the
present.

HY 337 History of Eastern Europe 3 cr
History of Eastern Europe since 1914.

HY 338 History of Russia 3 cr
History of Russia from Kievan Rus to Present.

HY 343 Witchcraft-Magic Europe 3 cr
The history of beliefs and practices concerning witches,
magic, and witch-hunting in Medieval and Early Modern
Europe.

HY 345 The First World War 3 cr
A history of the First World War, its background and its
aftermath.

HY 346 The Second World War 3 cr
A history of the Second World War, its background and its
aftermath.

HY 347 The Holocaust 3 cr
The history of the systematic mass murder of Europe's Jews
and other groups by Nazi Germany during World War II.
Cross-listed with REL 347. Credit cannot be received for
both HY 347 and REL 347.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HY 348</td>
<td>Hitler and Nazi Germany</td>
<td>3 cr</td>
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<td>The rise of Adolf Hitler and the Nazi Party to power in Germany and the history of National Socialist Germany from 1933 to 1945.</td>
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<tr>
<td>HY 351</td>
<td>Medieval Civil 950-1300</td>
<td>3 cr</td>
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<td>The development of European civilization in the High Middle Ages.</td>
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<td>HY 352</td>
<td>Renaissance Europe 1300-1520</td>
<td>3 cr</td>
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<td>The history of Europe during an age of great crisis and creativity.</td>
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<td>HY 353</td>
<td>Reformation Europe</td>
<td>3 cr</td>
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<td>The role of religious change in the 16th and 17th centuries.</td>
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<tr>
<td>HY 354</td>
<td>Ancient Regime Europe</td>
<td>3 cr</td>
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<td>Social, economic, political, and cultural life of Old Regime Europe.</td>
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<tr>
<td>HY 355</td>
<td>French Revolution</td>
<td>3 cr</td>
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<td>Political, cultural and social revolution of the late eighteenth and early nineteenth centuries, emphasizing the French Revolution.</td>
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<td>HY 356</td>
<td>European Civ 1815-1918</td>
<td>3 cr</td>
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<td>History of European Civilization from 1815-1918.</td>
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<tr>
<td>HY 357</td>
<td>Europe Since 1945</td>
<td>3 cr</td>
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<td>The history of Europe from the end of the Second World War to the present.</td>
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<tr>
<td>HY 362</td>
<td>History of Africa since 1500</td>
<td>3 cr</td>
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<td>A survey of the last five centuries of Africa's history moving from before European contact to the slave trade, colonial experience, and independence movements. Africans cultural patterns and its peoples' distinctive historical experience will be the focus of the course.</td>
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<tr>
<td>HY 364</td>
<td>Islamic Civilization to 1453</td>
<td>3 cr</td>
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<td>This course will cover the political, economic, social, and cultural history of Islamic Civilization from its beginnings in the Arabian Peninsula in the sixth century to the Ottoman conquest of Constantinople in 1453. Cross-listed with REL 364. Credit cannot be received for both HY 364 and REL 364.</td>
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<tr>
<td>HY 365</td>
<td>Islamic Civilization 1453 - W</td>
<td>3 cr</td>
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<td>This course will cover specific topics in the history of Islamic civilization. May be repeated for credit when content varies. Prerequisite: Junior or Senior status. Cross-listed with REL 365. Credit cannot be received for both HY 365 and REL 365.</td>
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<tr>
<td>HY 366</td>
<td>Traditional China</td>
<td>3 cr</td>
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<td>Historical development of China from prehistoric times to arrival of Western influences in the 1800s.</td>
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<tr>
<td>HY 367</td>
<td>Modern China - W</td>
<td>3 cr</td>
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<td>A study of Modern China from the arrival of Western influence in the 1800s to the present. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>HY 368</td>
<td>Japan</td>
<td>3 cr</td>
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<td>Japanese history from antiquity to the present and the emergence of Japan as major world political and economic power.</td>
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<tr>
<td>HY 369</td>
<td>Modern Japan</td>
<td>3 cr</td>
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<td></td>
<td>Japanese History from the late Tokugawa period to the present and the emergence of Japan as a major world political and economic power.</td>
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<tr>
<td>HY 371</td>
<td>Soc History of Early America</td>
<td>3 cr</td>
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<td></td>
<td>Patterns of frontier, agrarian, and urban society to 1865.</td>
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<tr>
<td>HY 372</td>
<td>Religion in American History-W</td>
<td>3 cr</td>
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<td>Examines the role of religion in United States history from the colonial era to the present. Identical with REL 373. Credit cannot be received for both HY 372 and REL 373. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>HY 373</td>
<td>HY of American Culture - W</td>
<td>3 cr</td>
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<td>Surveys American values, ideas, beliefs, and social institutions from c. 1770 to the mid-twentieth century. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>HY 374</td>
<td>History of Alabama</td>
<td>3 cr</td>
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<td>A survey of the state's history since the days of the native Americans, examining state and local issues against the broader backdrop of American history.</td>
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<tr>
<td>HY 375</td>
<td>African American Experiences</td>
<td>3 cr</td>
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<td>Examines the role of African Americans in United States history with an emphasis on social, political, economic, intellectual and cultural developments.</td>
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<tr>
<td>HY 376</td>
<td>Jews &amp; Modern Amer Culture-W</td>
<td>3 cr</td>
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<td>This course will look at the cultural history of Jews’ contributions to United States culture during the late 19th and 20th century. From Broadway to comedy (and beyond), American Jews have used their positionality as both insiders and outsiders to create lasting artifacts of cultural brilliance that helped to define the “American century” and continue to do so today. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<td>COURSES 174</td>
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<tr>
<td><strong>HY 384  Japanese Film</strong> 3 cr</td>
<td><strong>HY 436  Modern US I 1877-1945 - W</strong> 3 cr</td>
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<tr>
<td>This course will introduce students to major themes in recent Japanese history, including samurai culture and other issues pertaining to social class, Westernization, the postwar family, sixties radicalism, and recent popular culture. Students will explore these themes through Japanese film and literature, and will thus become familiar with major directors, including Akira Kurosawa, Yasujiro Ozu and Juzo Itami, and novelists such as Junichiro Tanizaki and Yukio Mishima.</td>
<td>History of urban industrialization, war, peace, prosperity, and depression. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.</td>
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<tr>
<td><strong>HY 390  Special Topics -</strong> 3 cr</td>
<td><strong>HY 437  Modern US II Since 1945 - W</strong> 3 cr</td>
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<tr>
<td>Special topics and their development, illustrating historical methodology. May be repeated twice for credit when content varies for a maximum of nine hours.</td>
<td>History of US in global perspective. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). EH 102 and EH 105 can be taken concurrently with this course.</td>
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<tr>
<td><strong>HY 401  Coll in History-</strong> 3 cr</td>
<td><strong>HY 441  Research Seminar-U.S. History</strong> 3 cr</td>
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<tr>
<td>A course which discusses various issues in history. May be repeated when content varies for a total of six hours. Prerequisite: Junior or Senior standing.</td>
<td>Research in topics in U.S. History. Limited to 15 students. Prerequisites: History major, Junior or Senior standing, permission from the Department Chair.</td>
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<tr>
<td><strong>HY 405  War and Soc 20th Century</strong> 3 cr</td>
<td><strong>HY 442  Research Seminar European Hy</strong> 3 cr</td>
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<tr>
<td>A seminar which studies major themes in the interaction of warfare and society in the 20th century.</td>
<td>Research in topics in European History. Limited to 15 students. Prerequisites: History major, Junior or Senior standing, permission from the Department Chair.</td>
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<tr>
<td><strong>HY 415  Studies in Military History</strong> 3 cr</td>
<td><strong>HY 443  Research Seminar-World HY</strong> 3 cr</td>
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<tr>
<td>This course will deal with different topics in Military History. May be repeated for twice for credit when content varies for a maximum of nine hours. Prerequisite: Junior or Senior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
<td>Research topics in Asian, African or Latin American History, or in the History of Islamic Civilization. Prerequisites: History major, Junior or Senior standing, permission from the Department Chair.</td>
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<tr>
<td><strong>HY 429  Studies Latin Amer History-W</strong> 3 cr</td>
<td><strong>HY 450  States, Nations, Nationalism-W</strong> 3 cr</td>
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<td>A seminar devoted to the exploration of a specific topic in Latin American history. May be repeated twice when content varies for a maximum of nine hours. Prerequisite: Junior or Senior standing. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
<td>Examines the rise of nationalism in modern Europe. This course is a 'W' course. Students cannot receive credit for both this course and HY 451.</td>
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<tr>
<td><strong>HY 431  Studies in U.S. History</strong> 3 cr</td>
<td><strong>HY 454  The British Empire</strong> 3 cr</td>
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<tr>
<td>This course will deal with different topics in U.S. History. May be repeated twice for credit when content varies for a maximum of nine hours. Prerequisite: Junior or Senior standing.</td>
<td>This course examines the rise, fall, and legacy of the British Empire.</td>
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<tr>
<td><strong>HY 432  Colonial America</strong> 3 cr</td>
<td><strong>HY 455  History of Travel and Tourism</strong> 3 cr</td>
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<tr>
<td>Colonial period to the revolution.</td>
<td>This course examines the history of British and American travel and tourism from the eighteenth century to the present.</td>
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<tr>
<td><strong>HY 433  The American Revolution</strong> 3 cr</td>
<td><strong>HY 457  Studies in European History -</strong> 3 cr</td>
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<tr>
<td>This course emphasizes changes occurring in American society ca.1750-1800.</td>
<td>This course will deal with different topics in European history. May be repeated twice for credit when content varies for a maximum of nine hours. Prerequisite: Junior or Senior standing.</td>
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<td><strong>HY 434  The Early Republic - W</strong> 3 cr</td>
<td><strong>HY 458  Sex,Celibacy Christian West</strong> 3 cr</td>
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<tr>
<td>The early Republic from 1789 to 1840. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
<td>This course examines the history of attitudes towards sexuality, marriage and celibacy in the Western World. It focuses on the question of how Christianity has shaped sexual norms and gender relations from ancient times to the present.</td>
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<tr>
<td><strong>HY 435  Civil War and Reconstruction</strong> 3 cr</td>
<td><strong>HY 461  Studies in Asian History -</strong> 3 cr</td>
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<tr>
<td>The United States from 1840-1877.</td>
<td>This course will deal with different topics in Asian history. May be repeated twice for credit when the content varies for a maximum of nine hours. Prerequisite: Junior or Senior standing.</td>
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<td>Course Code</td>
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<tr>
<td>HY 465</td>
<td>Studies in HY of Islamic Civ -</td>
<td>3 cr</td>
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<td>This course will cover specific topics in the</td>
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<td>history of Islamic civilization. May be</td>
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<td>repeated for credit when content varies.</td>
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<td>Prerequisite: Junior or Senior status. Cross-</td>
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<td>listed with REL 465. Credit cannot be</td>
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<td>received for both HY 465 and REL 465.</td>
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<tr>
<td>HY 471</td>
<td>Atlantic World - W</td>
<td>3 cr</td>
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<td>Examines the interactions among Europeans,</td>
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<td>Native American, and Africans in the Americas.</td>
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<td>This course is a &quot;W&quot; course.</td>
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<td>Pre-requisite: (EH 102 Minimum Grade of C or</td>
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<td>EH 105 Minimum Grade of C). EH 102 and EH 105</td>
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<td>can be taken concurrently with this course.</td>
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<tr>
<td>HY 475</td>
<td>The History of Mobile</td>
<td>3 cr</td>
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<td>The history of Mobile from its founding to its</td>
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<td></td>
<td>tercentenary.</td>
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<tr>
<td>HY 477</td>
<td>The Old South</td>
<td>3 cr</td>
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<td></td>
<td>This course examines the settlement and</td>
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<td></td>
<td>evolution of the American South from</td>
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<td></td>
<td>settlement of Jamestown to the Civil War.</td>
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<td>Of particular concern will be the degree to</td>
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<td>which the development of economic, social and</td>
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<td>political institutions in the South, especially</td>
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<td>the institution of slavery, increasingly</td>
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<td>isolated the region from the rest of the</td>
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<td>country.</td>
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<tr>
<td>HY 478</td>
<td>The New South</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>History of the South from Reconstruction to the</td>
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<td></td>
<td>1920's.</td>
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<tr>
<td>HY 479</td>
<td>The Modern South</td>
<td>3 cr</td>
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<td></td>
<td>Social, economic, political, intellectual, and</td>
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<td></td>
<td>cultural history of U.S. South from the 1930's</td>
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<td>to the present.</td>
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<tr>
<td>HY 482</td>
<td>Southern Autobiography</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Southern identity as revealed in 20th century</td>
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<td></td>
<td>autobiography and fiction. Students cannot</td>
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<td></td>
<td>receive credit for both this course and HY 480.</td>
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<tr>
<td>HY 485</td>
<td>American Feminist Movements</td>
<td>3 cr</td>
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<td></td>
<td>HY 485 examines the history of American</td>
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<td></td>
<td>feminist movements from the colonial period</td>
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<td>through the present. Students cannot</td>
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<td></td>
<td>receive credit for both this course and HY 390.</td>
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<tr>
<td></td>
<td>American Feminist Movements.</td>
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<td>HY 488</td>
<td>American West - W</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>This course examines manifest destiny,</td>
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<td></td>
<td>imperialism, &quot;the frontier&quot;, and the place of</td>
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<td></td>
<td>Native Americans in the history of the</td>
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<td></td>
<td>American West.</td>
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<td></td>
<td>Pre-requisite: (EH 102 Minimum Grade of C or</td>
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<tr>
<td></td>
<td>EH 105 Minimum Grade of C).</td>
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<tr>
<td>HY 494</td>
<td>Directed Studies -</td>
<td>1 TO 3 cr</td>
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<tr>
<td></td>
<td>Directed Individual Study. Requires approval of</td>
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<td></td>
<td>department chair.</td>
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<tr>
<td>HY 496</td>
<td>Public History</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>This course will introduce students to the</td>
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<td></td>
<td>field of public history as an academic field</td>
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<td></td>
<td>and a possible career. Students cannot</td>
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<td></td>
<td>receive credit for both this course and HY 495.</td>
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<tr>
<td>HY 498</td>
<td>Internship in History</td>
<td>3 TO 6 cr</td>
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<tr>
<td></td>
<td>Directed individual field research at the</td>
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<td>undergraduate level. Occupational and</td>
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<td>professional experiences under faculty</td>
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<td>direction in a defined field of interest,</td>
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<td>primarily for but not limited to archival,</td>
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<td>museum, library, or other public history</td>
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<td>projects. Written reports required. Special</td>
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<td>permission of departmental chair required.</td>
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<td>Maximum hours 6.</td>
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<tr>
<td>HY 499</td>
<td>Senior Honors Paper - H</td>
<td>1 TO 6 cr</td>
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<tr>
<td></td>
<td>The researching and writing of a major</td>
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<td>historical paper. Requires permission of</td>
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<td>department chair.</td>
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<tr>
<td>HY 501</td>
<td>Colloquium of History</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>A course which discusses various issues in</td>
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<td></td>
<td>history. May be repeated when content varies.</td>
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<td></td>
<td>Students cannot receive credit for both this</td>
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<td></td>
<td>course and HY 401.</td>
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<tr>
<td>HY 505</td>
<td>Warfare and Society 20th Cent</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>A seminar which studies major themes in the</td>
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<tr>
<td></td>
<td>interaction of warfare and society in the</td>
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<tr>
<td></td>
<td>20th century. Students cannot receive credit</td>
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<td></td>
<td>for both this course and HY 405.</td>
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<tr>
<td>HY 515</td>
<td>Studies in Military History -</td>
<td>3 cr</td>
</tr>
<tr>
<td></td>
<td>This course will deal with different topics in</td>
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<tr>
<td></td>
<td>military history. May be repeated for credit</td>
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<td></td>
<td>when content varies. Students cannot</td>
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<td></td>
<td>receive credit for both this course and HY</td>
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<td>HY 529</td>
<td>Studies in Latin Am. History -</td>
<td>3 cr</td>
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<td></td>
<td>A seminar devoted to the exploration of a</td>
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<td>specific topic in Latin American History. May</td>
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<td>be repeated for credit when content varies.</td>
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<td>Students cannot receive credit for both this</td>
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<tr>
<td></td>
<td>course and HY 429.</td>
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<tr>
<td>HY 530</td>
<td>American Historiography</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Examination of major American historians; study</td>
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<tr>
<td></td>
<td>of techniques, styles, ideas,</td>
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<td>interpretations, and critical evaluations.</td>
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<tr>
<td>HY 531</td>
<td>Studies in U.S. History -</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>A seminar devoted to different topics in U.S.</td>
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<td></td>
<td>History. May be repeated for credit when</td>
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<td>content varies. Students cannot receive</td>
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<td></td>
<td>credit for both this course and HY 431.</td>
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<tr>
<td>HY 532</td>
<td>Colonial America</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Colonial period to the Revolution.</td>
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<td>HY 533</td>
<td>American Revolution</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>This course emphasizes changes occurring in</td>
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<td></td>
<td>American society ca. 1750-1800.</td>
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<td>HY 534</td>
<td>The Early Republic</td>
<td>3 cr</td>
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<td></td>
<td>The early Republic from 1789-1849. Students</td>
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<td></td>
<td>cannot receive credit for both this course and</td>
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<td></td>
<td>HY 434.</td>
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<tr>
<td>HY 535</td>
<td>Civil War and Reconstruction</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>The United States from 1840-1877. Students</td>
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<td>cannot receive credit for both this course and</td>
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<td>HY 435.</td>
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<td>HY 536</td>
<td>Modern U.S. I 1877-1945</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>History of urban industrialization, war,</td>
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<td>peace, prosperity, and depression. Students</td>
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<td></td>
<td>cannot receive credit for both this course and</td>
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<td>HY 436.</td>
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</tbody>
</table>
HY 537 Modern U.S. II Since 1945 3 cr
History of U.S. in a global perspective. Students cannot receive credit for both this course and HY 437.

HY 538 20th Century U.S. History 3 cr
This course emphasizes interpretations of twentieth-century United States history.

HY 540 Modern European Historiography 3 cr
A study of the development of European historical literature and its theoretical and methodological bases.

HY 541 Major European Thinkers 3 cr
Seminar devoted to the writings of leading European thinkers of the last five hundred years, including such figures as Luther, Rousseau, Darwin, Marx, Freud and de Beauvoir.

HY 542 World Historiography 3 cr
Study of the development of World historical literature and its theoretical and methodological bases.

HY 546 Research in Soviet Soc History 3 cr
A study of the relationship between political and social developments in Soviet Russia from 1917 to 1941.

HY 550 States, Nations, Nationalism 3 cr
Examines the rise of nationalism in modern Europe. Students cannot receive credit for both this course and HY 451 or HY 450.

HY 551 Medieval Europe 3 cr
Seminar that explores the history of Western Europe between 950 and 1500, with emphasis on changes in government, economy, society, religion, thought, war and diplomacy.

HY 552 Renaissance Europe 3 cr
Seminar that explores intellectual and cultural developments in Western Europe between 1350 and 1600.

HY 553 Religious Reform in Europe 3 cr
Seminar that considers religious reform movements within the Catholic Church before the beginning of Protestantism, the development of the major Protestant tendencies, and the continuing development of reform within the Catholic Church after the Protestant break.

HY 554 The British Empire 3 cr
The history and legacy of the British Empire from the 17th century to the present.

HY 555 History of Travel and Tourism 3 cr
The history of Travel and Tourism: The British and American Experience from the Eighteenth Century to the present.

HY 557 Studies in European History - 3 cr
A seminar devoted to different topics in European History. May be repeated for credit when the content varies. Students cannot receive credit for both this course and HY 457.

HY 558 Sex, Celibacy Christian West 3 cr
This course examines the history of attitudes towards sexuality, marriage, and celibacy in the Western world. It focuses on the question of how Christianity has shaped sexual norms and gender relations from ancient times to the present.

HY 559 Modern European History 3 cr
Problems in historical interpretation and method from 1740 to present. May be repeated when topic varies.

HY 561 Studies in Asian History - 3 cr
A seminar devoted to different topics in Asian History. May be repeated for credit when the content varies. Students cannot receive credit for both this course and HY 461.

HY 564 Classical/Medieval Islamic His 3 cr
Seminar that explores the history of Islamic civilization from the sixth to the thirteenth centuries, with a focus on the political and cultural changes experienced by the Muslim world in this period.

HY 565 Studies in Islamic Civil. - 3 cr
A seminar devoted to different topics in the history of Islamic Civilization. May be repeated for credit when the content varies. Students cannot receive credit for both this course and HY 465.

HY 570 American Biography 3 cr
A study of American biography, autobiography, and methodology.

HY 571 Atlantic World 3 cr
This course examines the interactions among Europeans, Native Americans, and Africans in the Americas. Students cannot receive credit for both this course and HY 471.

HY 573 19th Century American West 3 cr
Seminar that explores the history of the American West in the nineteenth century, focusing on Manifest Destiny, imperialism, Mormonism, the environment, and the place of Native Americans in U.S. society.

HY 575 History of Mobile 3 cr
The History of Mobile from its founding to its Tercentenary. Students cannot receive credit for both this course and HY 475.

HY 577 The Old South 3 cr
This course examines the settlement and evolution of the American South for settlement of Jamestown to the Civil War. Of particular concern will be the degree to which the development of economic, social and political institutions in the South, especially the institution of slavery, increasingly isolated the region from the rest of the country.

HY 578 The New South 3 cr
History of the South from Reconstruction to the 1920's.

HY 579 The Modern South 3 cr
Social, economic, political, intellectual, and cultural history of the U. S. South from 1920-1990.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>HY 580</td>
<td>Research in Southern History</td>
<td>3 cr</td>
<td>History of the southern United States, from the colonial era to the present. Students will write a research paper involving interpretation of primary documents.</td>
</tr>
<tr>
<td>HY 581</td>
<td>Research in American History</td>
<td>3 cr</td>
<td>This is a variable content seminar course. Students will write a research paper involving interpretation of primary sources.</td>
</tr>
<tr>
<td>HY 582</td>
<td>Southern Autobiography</td>
<td>3 cr</td>
<td>Southern identity as revealed in 20th century autobiography and fiction. Students cannot receive credit for both this course and HY 480 or HY 482.</td>
</tr>
<tr>
<td>HY 585</td>
<td>American Feminist Movement</td>
<td>3 cr</td>
<td>This course examines the history of American feminist movements from the colonial period through the present. Students cannot receive credit for both this course and HY 390 (History of American Feminist Movements) or HY 485.</td>
</tr>
<tr>
<td>HY 586</td>
<td>Research in European History</td>
<td>3 cr</td>
<td>This is a variable content seminar course. Students will write a research paper involving interpretation of primary sources.</td>
</tr>
<tr>
<td>HY 590</td>
<td>Special Topics</td>
<td>3 cr</td>
<td>A colloquium of selected subjects and readings to be arranged by the department. Limited to fifteen students. May be repeated seven times for credit when content varies for a total of 24 semester hours.</td>
</tr>
<tr>
<td>HY 592</td>
<td>The Teaching of History</td>
<td>3 cr</td>
<td>The class is conceived as part seminar and part practicum. It is an introduction to the problems and principles of the teaching of history in secondary and higher education settings. It will combine instructor lecture, class presentations, and class discussions of assigned readings.</td>
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<tr>
<td>HY 593</td>
<td>Exam and Thesis Introduction</td>
<td>1 cr</td>
<td>This course seeks to provide M.A. students with a practical introduction to the research techniques and bibliographic knowledge that will facilitate the timely completion of a master's level program. Required of all incoming History M.A. students.</td>
</tr>
<tr>
<td>HY 594</td>
<td>Directed Studies</td>
<td>1 TO 3 cr</td>
<td>Directed individual study. May only be used in unusual cases to build on regular graduate course work. A maximum of nine credit hours of HY 594 may count toward degree requirements. Pre-requisites: Special permission of instructor required.</td>
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<tr>
<td>HY 595</td>
<td>Archival Practice</td>
<td>3 cr</td>
<td>Introduces graduate students to archival theory and practice.</td>
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<tr>
<td>HY 596</td>
<td>Public History</td>
<td>3 cr</td>
<td>This course will introduce students to the field of public history as an academic field and a possible career. Students cannot receive credit for both this course and HY 495 or HY 496.</td>
</tr>
<tr>
<td>HY 597</td>
<td>Pro Studies-Directed Field Research</td>
<td>3 cr</td>
<td>Directed individual field research. Occupational and professional experiences under faculty direction in a defined field of interest, including but not limited to archival, museum, library, or other public history projects. Written reports required. Special permission of departmental chair required.</td>
</tr>
<tr>
<td>HY 598</td>
<td>Comp and Thesis Preparation</td>
<td>0 cr</td>
<td>This zero credit hour course will provide continuous enrollment while engaged in comprehensive exam preparation or for thesis preparation beyond thesis hours.</td>
</tr>
<tr>
<td>HY 599</td>
<td>Thesis</td>
<td>1 TO 3 cr</td>
<td>Six hours required of student in the thesis track. May not be taken for credit toward a degree by students in the non-thesis track. Pre-requisites: Completion of nine hours of graduate level history, including one 500-level course in the field relevant to the thesis. Special permission of the department chair.</td>
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**Honors Interdiscipln Studies (HON)**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>HON 101</td>
<td>Honors Introduction-Research</td>
<td>1 cr</td>
<td>This course introduces freshman Research Scholars to the Honors Program, helps them plan their academic career, helps them identify and secure research opportunities, gets them started on their thesis project, and helps them adjust responsibly to the challenges presented by college life so as to maximize their potential for academic success. Reading, writing and project assignments relevant to the student s first year experience are required.</td>
</tr>
<tr>
<td>HON 201</td>
<td>Professional Skills Research-H</td>
<td>1 cr</td>
<td>This course helps Research Scholars in Honors to establish their research careers by identifying and securing research opportunities, by advancing their thesis projects, by honing their presentation skills, and by exploring and applying to national and international scholarship opportunities. Reading, writing and project assignments relevant to the students’ research and scholarship interests are required.</td>
</tr>
<tr>
<td>HON 290</td>
<td>Special Topics Honors</td>
<td>1 TO 3 cr</td>
<td>Topics for USA Honors Students of an interdisciplinary or multidisciplinary nature. May be repeated when topic varies. Prerequisite: USA Honors Program</td>
</tr>
<tr>
<td>HON 301</td>
<td>Intro Senior Honors Project</td>
<td>1 cr</td>
<td>This course is designed to introduce juniors in the USA Honors Program to scholarly research and creative activities in diverse disciplines. The primary graded assignment of the course is the guided development of an approved Prospectus for the Senior Honors Project.</td>
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</table>
HON 390 Special Topics Honors 1 TO 3 cr
Advanced topics for USA Honors students of an interdisciplinary or multidisciplinary nature. May be repeated when topic varies. Prerequisite: USA Honors Program

Hospitality/Tourism Management (HTM)

HTM 200 Intro to Hosp & Tour Ind 3 cr
This course provides students with a comprehensive introduction to the many entities that make up the hospitality industry, such as hotels, restaurants, clubs, cruise lines, and casino hotels. Students will learn about hospitality careers, the importance of service, and how hotels and restaurants are organized, as well as an overview of today's hot issues, including ethical challenges and management concerns.

HTM 210 Food & Bev Serv Mngt 3 cr
This course focuses on the tools necessary for managing food service operations in today's aggressive business environment. Students learn how to position, manage, and leverage a successful food service operation - commercial and non-commercial - in a variety of venues. Using a menu-driven approach, the course examines a variety of management tools, best practices, and techniques. Pre-requisite: HTM 200 Minimum Grade of D.

HTM 212 Food Sanitation and Safety 3 cr
In this course students are introduced to food safety principles and applications, the Hazard Analysis Critical Control Point System (HACCP), microbiology of food safety, infection control, and safety and environmental issues related to the foodservice and hospitality industry. Students completing the course are eligible to take the ServSafe exam offered by the National Restaurant Association.

HTM 220 Mtgs., Inc., Conv., Events 3 cr
This course will introduce students to multiple component of events management, including planning, marketing, ticketing, budgeting, operations, and evaluation. Students will engage in instruction, observation, and analysis in order to apply knowledge and theory to a specific event. The course will be delivered in a blended format. Pre-requisite: HTM 200 Minimum Grade of D.

HTM 310 Global Leadership for HTM 3 cr
This course examines principles of visionary global leadership in the hospitality industry by exploring leadership concepts, theories and fundamentals. Students begin to define their leadership paradigms, and identify leadership strategies that ameliorate personal and professional success. Pre-requisite: HTM 200 Minimum Grade of D.

HTM 312 Hospitality Service Culture 3 cr
This course explores the dimensions of successful service environments, comprised of various factors, including the values, beliefs, norms, rituals and practices, within hospitality organization. In this course, students will learn the value a customer-centric approach brings to an organization through the creation of a positive consumer experience. The course focuses on hospitality service culture and methods for implementation, management and improvements within the service delivery process by making customer care part of the organization's mission, vision, values and goals to garner a competitive advantage in the marketplace.

HTM 315 Hospitality/Tourism Marketing 3 cr
This course is designed to provide a broad overview of essential marketing, promotion, and sales principles currently applied in the tourism and hospitality industries. It provides an introduction to marketing theories, principles, and concepts, and an exploration of the role of marketing within a globalized hospitality organization. Students will identify marketing strategies, differentiate services marketing, explain the role of customer expectation, analyze market segments, evaluate target marketing, and demonstrate the ability to effectively communicate using audio visual materials. The focus is on achieving a competitive advantage in a global market. Students will also examine the trends, issues and problems influencing tourism and hospitality marketing in a dynamic intercultural environment. Pre-requisite: HTM 200 Minimum Grade of D.

HTM 320 Destination Mgmt. & Marketing 3 cr
The purpose of this course is to equip students with an understanding of the principles of destination management and marketing. Techniques for soliciting a variety of markets, planning presentations, and assessing economic impact of bookings, along with the role of convention bureaus as a catalyst to regional economic development will be important components of this course. The internal operations of a destination marketing organization, including stakeholder care, financial management, human resources management, and governance will also be explored. Pre-requisite: HTM 200 Minimum Grade of D.

HTM 330 Cruise Operations Management 3 cr
The course provides an introduction to the cruise market and the reasons for its significant growth. The principles, practices, and philosophies of cruising, along with cruise line employee roles and responsibilities are examined. Strategies for management and marketing are explored.
HTM 350  Hospitality HR Management  
This course is an introduction to hospitality management, including an overview of management in the hospitality industry and professional opportunities. The concepts and practices of hospitality management are examined and discussed. The scope and forms of hospitality organizations (e.g., food and lodging, resorts, tourism enterprises, conventions, events, attractions, etc.) are reviewed, as well as local and global trends within these organizations.
Pre-requisite: HTM 200 Minimum Grade of D.

HTM 396  HTM Career Planning  
This course teaches students to perform a good-fit analysis by aligning career and employer choices with self-assessment, determine competencies gaps, and develop a strategic professional development plan. Three credit hours. Offered in web-enhanced and web-blended formats.
Pre-requisite: HTM 200 Minimum Grade of D.

HTM 397  Study Abroad - Culinary  
This course is designed to engage students in active learning related to international culture, cuisine, and culinary practice in settings outside the United States. Through participation in the course, students will explore the culture of the host country, cuisine as it is related to the culture, and common food preparation and service practices. Activities include readings, lectures, discussions, reflective journaling, tours, observations, and active engagement in food preparation and service.

HTM 398  Study Abroad - Intl Hosp Mgt  
This course is designed to engage students in active learning related to international hospitality management in settings outside the United States. Through participation in the course, students will explore the culture, management practices, and service standards in the host country related to the hospitality industry. Activities include readings, lectures, discussions, reflective journaling, tours, observations, and active engagement in food preparation and service.

HTM 400  Legal Issues in HTM  
This course will provide a comprehensive study of the legal aspects of the hospitality industry with an emphasis on compliance and prevention of liabilities. The course is not intended to replace the legal services of an attorney, but rather provide an overview of common legal issues in the field of hospitality and tourism management. 3 credit hours. Blended or online.
Pre-requisite: HTM 200 Minimum Grade of D.

HTM 410  Sustainable and Eco-Tourism  
Examine the interaction of ecotourism with social, natural and cultural environments as well as the impacts of ecotourism on the environment and global societies.
Pre-requisite: HTM 200 Minimum Grade of D. HTM 200 can be taken concurrently with this course.

HTM 435  Quality Service Management - W  
This course is designed to prepare students to understand, challenge, and refine the principles of guest-services management in an organization. Theories and concepts of service will be explored with emphasis on identifying customer preferences and a systematic process for organizations to design service delivery systems and implement a successful quality service environment that consistently meets and exceeds customer expectations. This course is a designated writing intensive course (W) and all major writing assignments must be satisfactorily completed in order to receive credit for the course.
Prerequisites: EH 102 or EH 105, or placement; HTM 200 Introduction to Hospitality and Tourism Management.
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C and HTM 200 Minimum Grade of D.

HTM 440  Lodging Management  
This course is an exploration of issues facing the hotel and lodging industry. The goal of the course is to prepare students for the hospitality industry with a specific focus on the hotel industry. It will introduce students to multiple components of lodging management, including: sales and marketing; front office, housekeeping, maintenance and accounting departments; food and beverage operations for full- and limited-service hotels; safety and securing; careers in the lodging industry. Students will engage in instruction, observation, and analysis in order to apply knowledge and theory to specific hospitality lodging situations. The course will be delivered in a blended format or online format.
Pre-requisite: HTM 200 Minimum Grade of D.

HTM 445  HTM Financial Reporting  
This course is designed to provide hospitality and tourism students with a solid foundation of accounting concepts and methods of financial analysis that is required to be successful in the hospitality industry. The course provides students with a fundamental understanding of using numbers to operate various departments and analyze management reports and financial statements.
Pre-requisite: HTM 200 Minimum Grade of D.

HTM 450  Non-Traditional Lodging  
This course will provide students with an in-depth study into the unique world of "non-traditional" lodging, the condominium resort and vacation ownership industry and other forms of non-traditional lodging. The course focuses on the hospitality aspects of the condominium resort, vacation ownership industry, and recreation and park lodging, and specifically on how non-traditional lodging operations differ from traditional lodging operations such as hotels, motels, and resorts.
Pre-requisite: HTM 200 Minimum Grade of D.
HTM 490  Special Topics  1 TO 4 cr
This course is designed as an educational tool for college students to develop a theoretical understanding of the concept of servant leadership as it applies to the hospitality and tourism management industry, and to acquire and apply fundamental hospitality and tourism workplace competencies through "real-world" experiential learning activities that include "earning the right to lead" through engagement and visible leadership. Students will complete online learning modules related to theory and practice while also engaging in experiential learning activities in a hospitality organization.

HTM 494  Directed Studies  1 TO 4 cr
Directed study on a topic of special interest or significance in the field of hospitality and tourism management. Course requirements can be met through research, reading, writing, or lab activities, as approved by the department chair and supervising instructor. May be taken for 1-4 credit hours. May be repeated, if content varies, for up to six hours of credit. Prerequisites: Junior or Senior standing and approval of department chair and supervising instructor.

HTM 496  Internship I Capstone Exp - W  3 cr
This pre-internship course examines the impact of business environments on personal and career effectiveness in the Hospitality field. Topics include effective business communication, ethical decision making, and leadership development.
Co-requisite: HTM 498
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C and HTM 200 Minimum Grade of D. HTM 200 can be taken concurrently with this course.

HTM 498  Internship II  3 cr
This Internship II course provides students an opportunity to receive supervised, relevant, and practical experience in work that is related to the objectives of the Hospitality and Tourism Management (HTM) program.
Co-requisite: HTM 496
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C and HTM 200 Minimum Grade of D.

Information Systems (ISC)

ISC 190  IS Special Topics  1 cr
Selected topics in information systems. Prerequisite: Permission of the ISC coordinator.

ISC 245  Info Systems in Organizations  3 cr
An overview of information systems topics from an organizational and managerial perspective. Topics include current information technology and systems, such as the Internet and its organizational impacts; the emergence of global economy and digital firms; and the ethical and social impacts of information systems, such as privacy, intellectual property rights, and liability. Issues and strategies regarding information systems planning, systems development, decision making, and using IT for competitive advantage are discussed. Throughout the course, students will investigate the strategic uses of information technology in current industry-specific situations.

ISC 272  Systems Architecture  3 cr
This course introduces students to Information Technology hardware and systems software concepts. Topics include: computer hardware, operating systems, system software, hardware and software integration, operating procedures, system performance, security/safety, and compatibility. Student labs and hands-on activities will include: Windows, Unix, and Linux systems, system utilities and software tools. Credit cannot be received for both ITE 272 and ISC 272. Pre-requisite: CIS 115 Minimum Grade of C.

ISC 285  Intermediate Programming  3 cr
A second course in visual, event-driven programming that builds on the CIS 115. Topics include arrays, sequential files, random access files, structured exception handling, use of LINQ, object-oriented programming, debugging, and additional controls and objects. Programming projects are required. Credit cannot be received for both ISC 285 and ITE 285. Pre-requisite: CIS 115 Minimum Grade of C.

ISC 300  Health Informatics Clin Env  3 cr
This course provides an overview of concepts, terms, organization, and processes associated with patient care and clinical environments as they pertain to health informatics. The entire process of how a person accesses, moves within, and exits the system both as an inpatient and outpatient to obtain care. Students will observe and report on a variety of clinical settings and healthcare specializations throughout the semester. This course is designed for students with no prior clinical experience.

ISC 305  Info Systems-Technology  3 cr
The analysis, design, and implementation of information systems. Analysis of the functional areas of business and integration of computer tools to satisfy information requirements. Current development in business computer systems, including surveys of current systems and the Internet. Computer classrooms are utilized to provide students with "hands on" experience. Pre-requisite: CIS 250 Minimum Grade of C.
ISC 353  Info Sys Appl Development  3 cr
This course provides an accelerated approach to programming in a high-level, object-oriented language, especially for information systems. Coverage includes algorithmic problem solving, fundamentals of programming, procedures, decisions, repetition, arrays, files, exception handling, and object-oriented programming. The format for this course is lecture/lab. The instructor will demonstrate in class, and students will learn by doing homework problems and programming assignments. This course does not count towards a graduate degree in CIS. Some prior programming experience is desired and permission of Coordinator. Prerequisites: Math placement score of 65 or higher. Pre-requisite: University test - Math 65 or DS 090 Minimum Grade of C or (MA 112 Minimum Grade of C or MA 171 Minimum Grade of C).

ISC 360  Info Sys Analysis and Design-W  3 cr
A thorough examination of the analysis and design of computer information systems from the systems analysts view. The course will use an established software development methodology. At each step in the software development life cycle, both the methodologies used and the documentation required will be examined. Pre-requisite: ISC 245 Minimum Grade of C and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

ISC 361  Database for Info Systems  3 cr
The course builds on relational database and programming concepts by exploring the analysis, design, and implementation of more complex database systems. Topics include advanced data modeling, advanced query design, and application development in a database programming environment. Pre-requisite: CIS 324 Minimum Grade of C and (ISC 285 Minimum Grade of C or ITE 285 Minimum Grade of C).

ISC 362  IS Object-Oriented Analy-Des  3 cr
This course provides an introduction to an object-oriented analysis and design (OOAD) methodology as well as the tools and techniques for supplementing this methodology. The course will also cover the use of notational metalanguages such as Unified Modeling Language (UML) and OOAD computer-assisted software engineering (CASE) tools. Pre-requisite: ISC 245 Minimum Grade of C.

ISC 410  Health Informatics  3 cr
This course provides an overview of the concepts, terms, tools, and architectures associated with health informatics as applied to healthcare delivery. Topics include: electronic record systems, computerized physician order entry, health system standards, terminologies, workflow modeling, security and privacy of clinical data, clinical reporting, and the impact of information technology use on the quality and efficiency of health care delivery and outcomes.

ISC 450  Health Sys Analysis and Design  3 cr
This course provides an overview of the concepts, terms, tools, and architectures associated with health informatics as applied to healthcare delivery. Topics include: electronic record systems, computerized physician order entry, health system standards, terminologies, workflow modeling, security and privacy of clinical data, clinical reporting, and the impact of information technology use on the quality and efficiency of health care delivery and outcomes. Prerequisite: ISC 410 Minimum Grade of C.

ISC 455  Health Data Mgt Decision  3 cr
This course focuses on the design and management of electronic medical record systems and clinical decision support systems. Course content related to electronic medical record systems includes architectural components, technical design issues, and management; and, content related to clinical decision support systems includes decision support roles, extracting useful information from data, and legal and regulatory restrictions. Laboratory assignments will provide students with opportunities to interact with these systems. Prerequisites: ISC 410 Minimum Grade of C.

ISC 459  IS Appl Design-Implementation  3 cr
Analysis and design of information systems to support multiple locations via Intranet/Internet access. Additional and supporting topics, such as corporate privacy and security are also covered. Pre-requisite: CIS 324 Minimum Grade of C.

ISC 462  IS Strategy and Policy  3 cr
This course provides the top management, strategic perspective for aligning competitive strategy with information systems. Issues include the development and implementation of policies and plans to achieve organizational goals, including security policy. Pre-requisite: CIS 324 Minimum Grade of C.

ISC 463  IS Database Admn and Security  3 cr
An examination of the issues and activities associated with the administrator function for databases. This course will cover installation, implementation, user management, backup, and security. Pre-requisite: CIS 324 Minimum Grade of C.

ISC 464  IS Security and Risk Mgmt  3 cr
This course provides an introduction to the fundamental principles and topics of information systems security and risk management at the organizational level. This course views information security as a management issue that incorporates technical and management solutions. Topics include risk management, security policy, disaster planning, security law and ethics, and security education, training and awareness. Pre-requisite: (MGT 300 Minimum Grade of C or BMS 322 Minimum Grade of C or MGT 322 Minimum Grade of C) and (CIS 321 Minimum Grade of C or CIS 221 Minimum Grade of C).
ISC 467  Enterprise Information Systems  3 cr
This course provides an introduction to enterprise information systems and to business process modeling. Key concepts and techniques for identifying, designing, and documenting business processes will be presented. The way information technology can be used to manage, transform business processes is discussed. Successful organizational change strategies will be reviewed.
Pre-requisite: (MGT 300 Minimum Grade of C or BMS 322 Minimum Grade of C or MGT 322 Minimum Grade of C) and CIS 324 Minimum Grade of C.

ISC 472  Advanced Data Management  3 cr
This course provides an introduction to the concepts and technologies of business intelligence. Key concepts and techniques allow organizations to analyze data/information collected from transaction processing systems. The ultimate purpose of business intelligence, or business analytics, to support high quality decision support for executives and managers is presented. Concepts of data warehouses, data mining, including text and web mining, and considerations of new and emerging technologies are described in detail.
Pre-requisite: CIS 324 Minimum Grade of C and (ISC 360 Minimum Grade of C or ISC 355 Minimum Grade of C).

ISC 475  Info Systems Proj Management  3 cr
This course examines the principles and techniques of project management from an information systems perspective. Major topics covered include project context, project selection, and project planning. Students work in collaborative teams and are instructed in the use of a project software tool. Credit cannot be received for both ITE 475 and ISC 475.
Pre-requisite: CIS 324 Minimum Grade of C.

ISC 490  Special Topics  3 cr
Advanced selected topics in information systems. Prerequisite: Permission of the ISC Coordinator.

ISC 510  Health Informatics  3 cr
This course provides an overview of the concepts, terms, tools, and architectures associated with health informatics as applied to healthcare delivery. Selected research topics are introduced and independently studied. Topics include: electronic record systems, computerized physician order entry, health system standards, terminologies, workflow modeling, security and privacy of clinical data, clinical reporting, and the impact of information technology use on the quality and efficiency of health care delivery and outcomes. Prerequisite: Permission of the Director of CI Graduate Studies.

ISC 545  Management Information Systems  3 cr
This course provides an overview of information systems from an organizational, managerial, and technical perspective. The topics covered will focus on the strategic role of information systems and information technology in business processes, change and knowledge management, group and individual decision-making, and electronic commerce. Specific topics include current hardware, infrastructure and connectivity technologies, software and systems development methodologies. Internet-based applications, management challenges and opportunities created by information systems and global connectivity such as privacy, data and systems security and control, intellectual property, ethical and social consequences of information technology, and the impact of digital integration on an organization's competitiveness, products, services, procedures, and management structures. Prerequisite: Permission of the Director of CIS Graduate Studies.

ISC 550  Health Data Security & Comp  3 cr
This course involves a thorough examination of the security and privacy requirements of the Health Insurance Portability and Accountability Act (HIPAA) and the implementation of these requirements in the clinical environment. Students will learn how to address security development all the way through post-implementation, how to evaluate systems for vulnerabilities, and how to identify protected health information and covered entities.

ISC 551  Human-Comp Interface Design  3 cr
The course covers principles, guidelines, and methods in human computer interface design. Students complete a project involving the development, evaluation, and demonstration of a user interface. The interface is designed around a user and task analysis performed on a given problem. Students plan and conduct a usability study of a working prototype and report on results and recommendations. Prerequisite: Graduate Professional Component.

ISC 553  IS Web Site Management  3 cr
This course addresses the design, development, and management of a web server. Topics include the selection, installation, and configuration of an operating system and web server software, web server security and monitoring, and website maintenance. Prerequisites: Graduate Professional Component.

ISC 555  Health Data Mgt/Decision Supp  3 cr
This course focuses on the design and management of electronic medical record systems and clinical decision support systems. Course content related to electronic medical record systems includes architectural components, technical design issues, and management; and, content related to clinical decision support systems includes decision support roles, extracting useful information from data, and legal and regulatory restrictions. Laboratory assignments will provide students with opportunities to interact with these systems.
## COURSES

### ISC 559  IS App Design-Implementation  3 cr
Analysis and design of information systems infrastructures to support multiple locations, intranet/internet access, corporate privacy, and security. Capacity analysis and planning, installation, performance monitoring, and problem solving strategies. Prerequisites: Graduate Professional Component.

### ISC 560  Info Systems Analysis-Design  3 cr
This course will include an introduction to the systems development life cycle as well as a survey of analysis and design techniques. Detail topics will include information systems planning and project identification and selection, requirements collection and structuring, process modeling, data modeling, design of interface and data management, system implementation and operation, system maintenance, and change management implications of systems. Globalization issues in systems will also be discussed. Students will use current methods and tools such as rapid application development, prototyping, and visual development. Prerequisite: Graduate Professional Component.

### ISC 561  IS Database Management  3 cr
An introduction to database management systems. The data environment, basic technical concepts and systems resources, database concepts, including use and management of databases. Classical and current DBMS models will be presented. Laboratory project activity will involve definition, creation, and development of a database. Prerequisites: Graduate Professional Component.

### ISC 562  IS Policy and Strategy  3 cr
This course provides the top management, strategic perspective for aligning competitive strategy, core competencies, and information systems. Issues include the development and implementation of policies and plans to achieve organizational goals, including defining systems that support the operational, administrative, and strategic needs of the organization, its business units, and individual employees. Prerequisites: Professional Component.

### ISC 563  IS Database Administration  3 cr
This course will examine the issues and activities associated with the administrator function for organizational databases. Topics include storage and indexing, query evaluation, physical database design, crash recovery, and security. Prerequisite: CIS Graduate Professional Component.

### ISC 565  IS Project-Change Management  3 cr
A study of the concepts and techniques of project management from an information systems perspective. The course provides an overview of project lifecycle activities, and a focus on managerial, behavioral, and process issues that surround the dynamic context of systems development. The issue of managing the change brought about by the introduction or modification of information systems in organizations will be discussed. Students will be instructed in the use of software tools for project management. Prerequisites: Graduate Professional Component.

### ISC 567  IS Function Integration  3 cr
The tactical/operational responsibilities and roles of the CIO. Governance considerations that link the IS-business organizations. Current/emerging issues in creating and coordinating the key activities necessary to manage the day-to-day operations of the IS function. Coordinating skills and organizational IS infrastructure. Prerequisites: Graduate Professional Component

Pre-requisite: (ISC 526 Minimum Grade of B or ISC 561 Minimum Grade of B).

### ISC 568  IS Enterprise Integration  3 cr
Information systems role in transforming organizations and industries. An integrated view of the organization from an external and internal perspective. IS’ internal role in integrating the enterprise through a cohesive set of business processes and functional applications to meet business needs. Enterprise resource planning and enterprise functionality. Collaborative systems. Consideration of external relations with suppliers, outsourcers, and customers. Prerequisite: Graduate Professional Component.

Pre-requisite: ISC 567 Minimum Grade of B and Computer Science Graduate 030.

### ISC 572  Advanced Data Management  3 cr
The focus here is on the management of data and the technologies which specifically targets mass data storage with a view to online and after-the-fact examination of data to acquire new insights. The major topics include: data warehouse planning, data warehouse models, and supporting software, data mining concepts and tools, creation of data mining models for the tools and matching the tool to the task. Prerequisite: Graduate Professional Component.

### ISC 576  IS Function Integration  3 cr
The tactical/operational responsibilities and roles of the CIO. Governance considerations that link the IS-business organizations. Current/emerging issues in creating and coordinating the key activities necessary to manage the day-to-day operations of the IS function. Coordinating skills and organizational IS infrastructure. Prerequisites: Graduate Professional Component

Pre-requisite: (ISC 526 Minimum Grade of B or ISC 561 Minimum Grade of B).

### ISC 572  IS Enterprise Integration  3 cr
Information systems role in transforming organizations and industries. An integrated view of the organization from an external and internal perspective. IS’ internal role in integrating the enterprise through a cohesive set of business processes and functional applications to meet business needs. Enterprise resource planning and enterprise functionality. Collaborative systems. Consideration of external relations with suppliers, outsourcers, and customers. Prerequisite: Graduate Professional Component.

Pre-requisite: ISC 567 Minimum Grade of B and Computer Science Graduate 030.

### ISC 590  IS Sp Top -  3 cr
Advanced selected topics in information systems.

Prerequisite: Permission of ISC coordinator.

### ISC 595  IS Project Proposal Develop  1 TO 3 cr
Development of the project proposal for the Information Systems specialization master's project. Prerequisites: CIS 518, Graduate Professional Component, Permission of Director of CIS Graduate Studies.

Pre-requisite: CIS 518 Minimum Grade of S and Computer Science Graduate 030.

### ISC 598  Information Systems Project  1 TO 3 cr
This course may be repeated for a maximum of six (6) credits. A CIS project committee will provide direction during the project. Prerequisite: Approval of project proposal by the student's project committee, and permission by Director of CIS Graduate Studies.

Pre-requisite: ISC 595 Minimum Grade of B.
IS C 629  Comp Ecosystems  3 cr
This course focuses on developing expertise and preparation for independent research in computing ecosystems through an in-depth review of the computing literature. The course will explore concepts and issues associated with large scale parallel data processing, virtualized storage, application, and infrastructure architectures and the attendant security, privacy and legal issues.

IS C 673  Digital Investigations  3 cr
This course focuses on developing expertise and preparation for independent research in Digital Forensics Investigations through an in-depth review of the Digital Forensics literature. The student will be conversant in broad issues and trends in Digital Forensics as defined by skill sets and occupations.

IS C 675  Information Systems  3 cr
This course focuses on developing expertise and preparation for independent research in information systems through an in-depth review of the information systems literature. The course will explore the current major streams of theory, research, and methodologies in information systems.

IS C 686  Risk Analysis  3 cr
This course focuses on developing expertise and preparation for independent research in risk analysis through an in-depth review of the risk assessment and information assurance literature. The student will be conversant in broad issues and trends in risk analysis as defined by techniques, methodologies, policies, frameworks, and skill sets.

Information Technology (ITE)

ITE 190  ITE Special Topics  1 cr
Selected topics in information technology. Prerequisite: Permission of the ITE coordinator.

ITE 271  Info Techn in Organizations  3 cr
This course introduces students to the Information Technology (IT) concepts and the software that facilitates IT solutions. Topics include: data, information, and knowledge concepts, productivity software tools, role of networking and communication, the "digital phenomena", and the benefits of IT. Also included are IT program concepts such as: ethics, the importance of effective written and oral communication, continuous learning, and technology monitoring-evaluation.

ITE 272  Systems Architecture  3 cr
This course introduces students to the Information Technology (IT) hardware and systems software concepts. Topics include: computer hardware, operating systems, system software, hardware and software integration, operating procedures, system performance, security/safety, and compatibility. Student labs and hands-on activities will include: Windows, Unix, and Linux systems, system utilities and software tools.
Pre-requisite: CIS 115 Minimum Grade of C.

ITE 285  Intermediate Programming  3 cr
A second course in visual, event-driven programming that builds on CIS 115. Topics include arrays, sequential files, random access files, structured exception handling, use of LINQ, object-oriented programming, debugging, and additional controls and objects. Programming projects are required. Credit cannot be received for both ISC 285 and ITE 285.
Pre-requisite: CIS 115 Minimum Grade of C.

ITE 370  Adv Application Development  3 cr
This course explores advanced topics in visual applications development. Emphasis is placed upon developing increased program functionality and connectivity with local and remote databases. Other topics: integrating programming components and libraries, object-oriented application development and testing methodologies, and using an object-oriented approach for multi-tiered applications. Programming projects are required.
Pre-requisite: (ITE 285 Minimum Grade of C or ISC 285 Minimum Grade of C) and CIS 324 Minimum Grade of C.

ITE 372  Advanced Operating Systems  3 cr
This course introduces students to advanced Operating Systems techniques and related system architecture concepts. Students will examine how Operating Systems retain parameters set during installation and customization as well as the basic strategies used in Operating System security. Students will use advanced command-line tools to discover and modify settings within the Operating System and will use advanced scripting techniques to parse data within Operating System's files.
Pre-requisite: (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C) and (ISC 285 Minimum Grade of C or ITE 285 Minimum Grade of C).

ITE 373  File Sys for Digital Forensics  3 cr
This course introduces students to advanced file system techniques used in Forensic Analysis. Students will examine the current principles in drive storage hardware and file systems, including Windows and Linux-based systems and evaluate possible data hiding techniques which can be employed within these systems. Students will be required to perform imaging of hard drives for analysis of possible hidden data using techniques covered in this course.
Pre-requisite: (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C).
ITE 375  Publishing for the WWW  3 cr
This course is an introduction to the models and tools used to develop documents for the World Wide Web. Course topics include website planning and design, markup and styling languages, graphics, multimedia utilization, typography, and scripting. Website design issues such as ethics, copyright and intellectual property rights are also covered. Prerequisites: CIS 321 and either ISC 272 or ITE 272.
Pre-requisite: CIS 321 Minimum Grade of C and (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C).

ITE 380  Multimedia Production  3 cr
This course covers the models and tools of multimedia development and production. Development models include: message analysis, audience analysis, and media formats. Technical issues include: data formats, data interoperability, and hardware concepts. From a practical perspective, students will develop a multimedia project.
Pre-requisite: (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C).

ITE 382  Network Administration  3 cr
This course examines the network and database administrator functions in an organization. Students study the functions required of an administrator to facilitate the usage of the environment while securing the resources. Various methods and software products will demonstrate the areas of access and security.
Pre-requisite: CIS 321 Minimum Grade of C and (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C).

ITE 384  Network Infrastructure Systems  3 cr
This course focuses upon the concepts of network hardware systems that provide interconnection of communication devices. Topics include: network architectures and technologies, concepts such as routing, addressing, and network protocols (TCP/IP and others). Students will be required to setup, configure, and manage wired and wireless network equipment such as switches, routers, access points, and gateways.
Pre-requisite: CIS 321 Minimum Grade of C and (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C).

ITE 453  Web Site Management  3 cr
This course addresses the design, establishment and implementation of a World Wide Web site. Issues addressed are: definition of the site, establishment of a physical site, choice of a Web server, determination of software requirements, implementation details, security, management, and monitoring of the site.
Pre-requisite: CIS 321 Minimum Grade of C and (ISC 272 Minimum Grade of C or ITE 272 Minimum Grade of C).

ITE 473  Digital Forensic Analysis  3 cr
This course introduces students to acceptable methodologies of securing, collecting, analyzing and reporting data of a computer forensics investigation. Topics include: Ethics, introduction to computer investigations, evidence control, forensics tools, data acquisition, data recovery, data analysis and presenting the results. Students will be required to perform several forensics analyses in a controlled lab environment.
Pre-requisite: ITE 372 Minimum Grade of C and ITE 373 Minimum Grade of C and CJ 223 Minimum Grade of C.

ITE 474  Human Computer Interface  3 cr
Students will study the concepts of human-computer interaction and interface design. Topics include: detailed human-computer interaction concepts, modern graphical user interface models, and interface usability testing. Students will use rapid-prototyping tools to develop and test a typical user interface. Credit cannot be received for both ITE 474 and ISC 474.
Pre-requisite: (EH 372 Minimum Grade of C or EH 373 Minimum Grade of C) and (ISC 285 Minimum Grade of C or ITE 285 Minimum Grade of C).

ITE 475  IT Project Management  3 cr
This course examines the principles and techniques of project management from an information technology perspective. Topics included are: project planning, scheduling, resource allocation, and project management software tools. There is a specific focus on management of software projects, integrating the principles of information systems/needs analysis, software engineering, risk management, and change management. Both the technical and behavioral aspects of project management are covered.
Credit cannot be received for both ITE 475 and ISC 475.
Pre-requisite: CIS 324 Minimum Grade of C.

ITE 476  Network Security Management  3 cr
This course examines network and web security issues including: risks and threats, system access points, hardware and software defense methods, and organizational security policies. Labs will require students to analyze systems for potential threats, implement security procedures, monitor systems for security breaches, and institute recovery or repairs.
Pre-requisite: ITE 382 Minimum Grade of C and ITE 384 Minimum Grade of C.

ITE 480  Needs Assess-Tech Eval - W  3 cr
This course presents methodologies for assessing technological needs in support of organizational information requirements. Students learn the next logical step is a formal means of evaluating a given technology. Major topics of the course are specifying organizational needs, identifying potential technologies, evaluating potential benefits, assessing the organization's ability to utilize the technology. Students will examine planning for technological change and strategic implementation of the change.
Pre-requisite: ITE 271 Minimum Grade of C and (EH 372 Minimum Grade of C or EH 373 Minimum Grade of C).
ITE 482  Adv Web Development  3 cr
This is an advanced course in web programming and development. This course provides a hands-on approach using high-level development tools to learning advanced web programming concepts including server-side and database processing. Students will implement usability and security features into the development of modern web applications.
Pre-requisite: CIS 324 Minimum Grade of C and ITE 375 Minimum Grade of C.

ITE 484  Advanced Network Management  3 cr
This course explores advanced network management issues including: developing/designing network implementation strategies, managing users and data, providing operational support and help-desk, developing network use policies, developing network recovery procedures. Labs will require that students manage an operational network that provides typical network services and experience the day-to-day problems that network administrators encounter.
Pre-requisite: ITE 382 Minimum Grade of C and ITE 384 Minimum Grade of C.

ITE 485  ITE Senior Demo Project  3 cr
A senior capstone project course that utilizes teams and/or individuals working from problem requirements and specifications to produce a solution. This requires exploration of suitable information technologies to produce a solution that improves the problem situation. Students/teams will analyze, plan, and report on the project and implement a prototype. Prerequisites: Permission of the ITE coordinator.
Pre-requisite: ITE 370 Minimum Grade of C and (EH 372 Minimum Grade of C or EH 373 Minimum Grade of C).

ITE 490  Special Topics  3 cr
Advanced selected topics in information technology. Prerequisite: Permission of the ITE coordinator. Pre-requisite: Computer Sci Prof Component 30 or Computer Science Graduate 030

ISD 310  Instructional Design  3 cr
Instructional Design is a project-based course that includes step-by-step strategies to create instruction using the design models, instructional strategies, and technology applications. Students will explore the processes of analysis, design, development, implementation, and evaluation in order to apply real-world training solutions to actual instructional problems.

ISD 320  Training Interventions  3 cr
This course will provide students with experience in designing and developing facilitator-lead training interventions focused on improving performance in various contexts. Students will interact with a client in a professional manner and create a professional training session incorporating motivational strategies, instructional delivery methods, and appropriate assessment measures from initial contact needs assessment to final session evaluations.

ISD 340  Analysis, Assessment & Eval  3 cr
Students will learn how to make assessments of human attitudes, knowledge, and performance, analyze empirical data, and evaluate training and human performance programs.

ISD 350  Emerg Learning Technologies  3 cr
This course provides students with the skills and knowledge necessary to develop technology-based modules using different delivery methods for application in non-instructional and instructional training solutions. Pre-requisite: ISD 310 Minimum Grade of C.

ISD 360  Communication Skills in Org  3 cr
This course is designed to utilize theory and practice of communication in the processes of analysis, design, development, implementation and evaluation of instruction. Communication skills will be developed and applied in a practical setting.

ISD 370  Distance and Mobile Learning  3 cr
This course will identify and utilize innovative technologies related to distance and mobile learning in various job sectors and learning environments. Pre-requisite: ISD 310 Minimum Grade of C.

ISD 400  Portfolio Development  1 cr
Students will create an online portfolio to showcase projects, assignments, and collaborations related to instructional design and performance improvement. Pre-requisite: ISD 310 Minimum Grade of C.

ISD 410  Org/Coordination Training  3 cr
This course is designed to develop knowledge and competencies in the coordination of large-scale, comprehensive training programs. Pre-requisite: ISD 320 Minimum Grade of C and ISD 340 Minimum Grade of C.
ISD 420  Cultural Factors in IDD & HPI  3 cr
This course will focus on the interaction of multicultural aspects of learning and teaching. Students will enhance their cognitive and affective awareness and understanding, as well as their personal acceptance of differences associated with the learning/teaching process. The ultimate goal is to prepare multiculturally competent designers of instruction for a global society.

ISD 430  Psych of Learning in Organ-W  3 cr
The course covers major theoretical perspectives in organizational psychology based on empirical research and case studies. Students will explore learning theory, group dynamics, and change in different types of learning organizations.

ISD 440  Human Develop. Interventions  3 cr
Students will learn and apply various human development theories and interpersonal skills related to the effective design of training interventions to improve learning and performance. A special area of emphasis will focus on students’ own development experiences.

ISD 450  Human Performance Tech  3 cr
This course includes conducting various types of analysis in order to solve human performance problems by design on non-instructional interventions. Pre-requisite: ISD 340 Minimum Grade of C.

ISD 480  Learn Train & Perf Project  3 cr
Students will complete a supervised field project on a topic related to instructional design and/or performance improvement.

ISD 490  Special Topics  3 cr
This course will allow faculty to work with students to explore current topics related to instructional design and performance improvement. Scholarly articles and current trends will be the basis for the designated learning outcome and end product. Pre-requisite: ISD 310 Minimum Grade of C and ISD 350 Minimum Grade of C and ISD 360 Minimum Grade of C.

ISD 495  Internship  3 cr
The internship is a supervised learning experience in an actual or similar setting in which instructional design or performance improvement related professionals are employed. Pre-requisite: EH 102 Minimum Grade of C.

ISD 581  Digital Media Tools  3 cr
This course helps students learn to use computers to design instruction.

ISD 582  Evaluation of Digital Media  3 cr
An advanced course in the development, use and evaluation of multimedia instruction.

ISD 583  Interactive Video  3 cr
This course involves digital editing and includes basic instruction in shooting, lighting and composing video sequences.

ISD 584  Animation  3 cr
An introductory course that provides students with an opportunity to acquire the skills necessary to develop animated interactive modules for use in instruction.

ISD 585  Integr Tech in Teaching  3 cr
The purpose of this course is to enable students with some technology background in computers to focus the use of a variety of technologies onto a specific content area of instruction. Students will demonstrate cognitive competency of curriculum integration, instructional design, and production techniques. Specific attention will be given to videodisc technology, AV and computer technology.

ISD 590  Sp Top -  3 cr
Topics of contemporary interest in the area of Educational Media will be presented, discussed and investigated.

ISD 594  Dir St and Research  1 TO 3 cr
Students explore problems and issues of special interest or consequence in Instructional Design and Development. Not more than three semester hours may be accepted toward degree programs.

ISD 595  Internship - Masters  1 TO 6 cr
The internship is a supervised learning experience in an actual or similar setting to that in which instructional designers or media administrators are employed.

ISD 598  Research and Dev Project  1 TO 6 cr
A supervised field project, study or investigation on a topic related to Instructional Design and Development. Students will conduct an investigation which applies skills learned during the Instructional Design and Development Masters program.

ISD 599  Thesis  1 TO 3 cr
A student selects a project, study or investigation related to the area of specialization in Instructional Design and Development. The project forms a basis for the thesis. A thesis committee provides direction during the investigation and during the writing of the thesis.

ISD 600  Learning Tools  1 cr
This one-credit-hour course is designed to introduce students to some of the basic media tools that will help them with their coursework and in the work place. The course will typically be a series of two-hour class periods scheduled at somewhat regular intervals.

ISD 601  Sem Instruct Design-Dev  3 cr
Discussion and investigation of particular topics related to Instructional Design and Development.
ISD 602  Writing For Instruction  3 cr
Course serves as an overview and review of essential written communication skills needed by instructional design professionals.

ISD 610  Trends and Issues in IDD  3 cr
Discussion and investigation of history, current trends, and issues in instructional design and their implications for education and training.

ISD 611  Macro Lvl Trning & Perform Sys  3 cr
Course provides an overview of concepts and current issues related to the design and development of training and performance systems at the macro-level. Rather than focusing on specific, small-scale instructional or non-instructional interventions, students in this course will study learning and performance from a broad organizational perspective.
Pre-requisite: ISD 621 Minimum Grade of B and ISD 641 Minimum Grade of B.

ISD 612  Alt Instructional Models  3 cr
A comprehensive course detailing conventional and alternative instructional-design models. It is intended for advanced IDD students to further develop their skills and knowledge about ID models and to formulate their own epistemological beliefs as to how ID should occur.
Pre-requisite: ISD 622 Minimum Grade of B.

ISD 613  Instructional Strategies  3 cr
In this course, students explore the use of an assortment of instructional strategies to meet diverse learning needs.

ISD 614  Human Cognition for IDD  3 cr
A survey course of the cognitive science literature that is especially relevant for instructional designers and human performance technologists. The course covers major theoretical perspectives in cognitive science and has students read original empirical research. The goal is to enable IDD students to utilize the cognitive science literature in their careers.
Pre-requisite: EPY 502 Minimum Grade of B.

ISD 620  Research in Instr Tech  3 cr
Students collaborate with a graduate faculty member who is conducting research in the area of instructional design and development. May be repeated for credit.

ISD 621  Instructional Design  3 cr
Introductory course that focuses on a recognized model of instructional design. Includes emphasis on instructional analysis, instructional objectives, performance assessment, instructional strategies and sequences, and formative evaluation.

ISD 622  Adv Instructional Design  3 cr
Application of advanced instructional design models and procedures for needs assessment, instructional development, and evaluation in various instructional and learning environments using current learning tools.
Pre-requisite: ISD 621 Minimum Grade of B.

ISD 623  Adv Research Methodology  3 cr
A comprehensive course detailing advanced research methods and research. This course is specifically geared toward advanced IDD students who wish to develop the skills to properly design, propose, carry out, and critique scholarly research. The course covers the specifics of advanced research design and methods through a thorough analysis of empirical research. The goal is to equip IDD students with the research design skills to become successful scholars and researchers in their field.
Pre-requisite: IDE 510 Minimum Grade of B or IDE 620 Minimum Grade of B.

ISD 640  Needs Assessment  3 cr
The course focus is on conceptualization of needs analysis related to instructional and performance improvement issues in selected settings. Students collaboratively apply a needs assessment model to determine needs, causes, and solutions and report findings and recommendations.

ISD 641  Performance Systems Tech  3 cr
This course provides students with practical methods of analyzing and solving human performance problems. Emphasis is placed on development of both non-instructional and instructional interventions.

ISD 642  Project Coordination  3 cr
This course will develop knowledge and competencies in the coordination of large instructional projects. It is designed to enhance skills in the basic functions of instructional project coordination: planning, organizing, controlling, and directing.

ISD 650  Computer-Based Training  3 cr
A course for persons interested in the use of the computer to present instructional materials to students. Current learning theory as it pertains to authoring will be discussed.

ISD 651  Learning Theory and Technology  3 cr
This course will present techniques for the integration of instructional design theory and practice into the newer delivery systems including those using video and digitized media.

ISD 652  Technology-Based Instruction  3 cr
This course is a continuation of ISD 651. It concentrates on the additional skills and software necessary to develop and produce an original interactive instructional product.

ISD 653  Developing Online Instruction  3 cr
Developing online instruction using course management tools, multi-media technologies, and instructional design principles.
Pre-requisite: ISD 621 Minimum Grade of B.

ISD 655  Print and Screen Courseware  3 cr
Designing, producing and applying print and screen courseware. An analysis of graphic and instructional design principles and technologies, alternatives to conventional prose, learned capabilities, readability, formulate, and resource constraint analysis. Students design, develop, and apply print and screen courseware in instructional modules.
ISD 656  Training Interventions  3 cr
Practical experience in designing and implementing facilitator-led training in various large-scale organizations.

ISD 657  Teaching in Higher Education  3 cr
Theory and practice of pedagogy in higher education. Principles of the analysis, design, development, implementation, and evaluation of instruction will be addressed and then applied in a practical setting with a mentor instructor.

ISD 680  Emerging Technologies  3 cr
Course introduces students to emerging technological breakthroughs in education and training settings especially emphasizing the effects of future technologies.

ISD 682  Impact Emerging Technologies  3 cr
This course examines the impact of new digital technologies in education and training and prepares educators to use digital approaches in their institution.

ISD 694  Dir St and Research -  3 cr
Students explore problems and issues of special interest or significance in Instructional Design. Not more than three semester hours may be accepted toward degree program.

ISD 695  Internship - Doctoral  1 TO 6 cr
The internship is a supervised learning experience in an actual or similar setting to that which instructional designers or media administrators are employed.

Interdepartmental Education (IDE)

IDE 010  Reading Exam  0 cr
IDE 010 is a one hour reading exam that tests students’ current proficiency in communication skills. Failure to complete the exam as scheduled, with a passing score, will require the students to re-register for IDE 010.

IDE 101  Freshman Seminar in Education  2 cr
Assists freshmen with maximizing the student's potential to achieve success and to respond responsibly to the individual and interpersonal challenges presented by college life. Emphasis will be placed on study skills, time management, and writing skills. The course also provides information on the functions and resources of the University that support student academic success. Special emphasis is placed on orienting the student to the special roles and responsibilities of being an educator in today's society.

IDE 400  Positive Classroom Mgt  3 cr
Emphasis is placed on ways to create a class and school environment that encourages responsible student behavior. William Glasser’s concept of Reality Therapy as a process for successful teacher-student involvement is examined.

IDE 510  Educ Research and Evaluation  3 cr
Course will examine research and evaluation methodology, its application to questions in education, and the application of research findings to problems in education. The students will read and evaluate research in education.

IDE 525  Fnds Teach Eng Sec Lang  3 cr
A comprehensive survey of current research, methodology and materials in the field of English as a Second Language.

IDE 540  Found of Career Education  3 cr
The underlying philosophies behind the career education movement and various approaches to career education are discussed. Ways to increase the career options available to individuals and to facilitate more rational and valid career planning and preparation, are explored through the career education phases: career awareness, career exploration, and career preparation.

IDE 590  Sp Top -  1 TO 3 cr
Current topics of special concern to educators. Not more than 6 hours may be earned in Special Topics courses.

IDE 594  Dir St and Research  1 TO 3 cr
Exploration of problems and issues of special interest or significance in education. Not more than 3 hours can be accepted for a degree.

IDE 597  Student Teaching -  3 TO 6 cr
Observation and supervised teaching in selected schools with opportunity for study and discussion of problems and issues encountered. Prerequisite: Permission of advisor.

IDE 615  Assess & Eval for Leaders  3 cr
This course will focus on the assessment and evaluation skills needed by educational leaders. The course will provide students with the knowledge and skills to carry out, and utilize effectively, the evaluations of programs, organizations, personnel, and students. The course will also cover how to create, interpret, and evaluate the reliability and validity of assessments.

IDE 620  Quantitative Methods I  3 cr
Basic quantitative methods for decision making in the educational environment. Computer application of basic descriptive and inferential statistics. Pre-requisite: IDE 510 Minimum Grade of B.

IDE 621  Quantitative Methods II  3 cr
Basic research designs, with appropriate statistical analysis. The course will consider strategies needed for, but not limited to, the following: N-of-One research surveys and needs assessments; expost-facto designs, and true experimental designs. Pre-requisite: IDE 620 Minimum Grade of B.
IDE 630  Quantitative Methods III  3 cr
An extensive examination of the nature and character of experimental design in educational research. Includes the development of appropriate analytical techniques.
Pre-requisite: IDE 620 Minimum Grade of B and IDE 621 Minimum Grade of B.

IDE 631  Intro Qual/Mixed Methods Res  3 cr
Introduces students to the major kinds of qualitative research and mixed methods research. Attention is given to underlying philosophies, methods of data collection, theoretical perspectives, research design, sampling, data analysis and interpretation, validity types and strategies, and writing research reports.
Pre-requisite: IDE 510 Minimum Grade of B or IDE 692 Minimum Grade of B.

IDE 635  Adv Measurement and Eval  3 cr
Pre-requisite: IDE 620 Minimum Grade of B.

IDE 640  Instructional Development  3 cr
Preparation of a modular program of instruction which incorporates all elements of the instructional-design process.

IDE 645  Adv Human Perform Improvement  3 cr
This course provides students with knowledge and skills related to human performance improvement in relation to instructional design profession. It provides an overview of foundational theories of industrial-organizational psychology, organizational behavior, and organizational development and change in relation to instructional design and performance improvement practices.

IDE 650  Instructional Techniques  3 cr
This course assists teachers in becoming more professional in instructional skills through the use of micro-teaching techniques and analysis of research in teaching.

IDE 660  Program Research and Eval  3 cr
Course strives to increase the effectiveness of instructional personnel in their use of research and evaluative techniques in instructional environments. Three major areas of focus are: the conceptualization of research and evaluative models appropriate for the population; the application of basic assessment concepts to the teaching-learning environment; and the analysis of basic applied research in evaluation.
Pre-requisite: IDE 510 Minimum Grade of B. IDE 510 can be taken concurrently with this course.

IDE 665  Inter Techniques Instr Envrmts  3 cr
This course concentrates on developing three major areas: the examination of psychological underpinning of various communicative models and concepts; the practicing of interactional skills, such as active listening, congruent sending, and conflict resolution; the building of a communication model for the student's instructional environment.

IDE 685  Ed Simulation and Games  3 cr
Teaches the role and function of simulation and games as effective instructional and learning devices.

IDE 690  Special Topics -  1 TO 3 cr
Current topics of special concern to educators. Not more than 6 semester hours may be earned in Special Topics courses.

IDE 692  Research Project Seminar  3 cr
Survey of both current and classic research in education. Students will identify a research problem of significance in their area of specialization and develop a strategy or research design to solve this problem.
Pre-requisite: IDE 510 Minimum Grade of B.

IDE 694  Dir St and Research  1 TO 3 cr
Exploration of problems and issues of special interest or significance in education. Not more than 3 semester hours can be accepted for a degree.

IDE 696  Internship-Masters/Doctoral-  0 cr
The internship is a supervised learning experience in an actual or similar setting to that in which instructional designers or medial administrators are employed.
Prerequisite: Approval of internship coordinator.

IDE 700  AU-USA Doctoral Program  1 cr
Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations. May be repeated as necessary.

IDE 710  Research Seminar I  1 TO 6 cr
This course provides an introduction to doctoral study in IDD. Topics include graduate student socialization, nature of scholarship and scholarly writing, epistemology, sociology of knowledge, and systems theory as a meta-theory. Admission to doctoral program is required. 3 credit hours.

IDE 711  Research Seminar II  1 cr
This course is designed to help doctoral students think about their dissertation research, understand the process of reviewing the literature, and organizing and writing a dissertation-level research proposal. Prerequisite: Approval of student's dissertation advisor. 1 credit hour per semester for 3 semesters.
Pre-requisite: IDE 710 Minimum Grade of S.
IDE 790  Sp Top - 1 TO 3 cr
Current topics of special concern to educators. Not more than 6 semester hours may be earned in Special Topics courses.

IDE 792  Research Proj Seminar 3 cr
Survey of both current and classic research in education. Students will identify a research problem of significance in their area of specialization and develop a strategy or research design to solve this problem. Pre-requisite: IDE 510 Minimum Grade of B.

IDE 794  Dir St and Research 1 TO 3 cr
Exploration of problems and issues of special interest or significance in education. Not more than 3 hours can be accepted for a degree.

IDE 799  Research-Dissertation 1 TO 9 cr
Independent research by the student under the sponsorship of the graduate faculty. Students are required to achieve doctoral candidacy before enrolling in the course. Requires faculty advisor approval.

**Interdepartmental Studies (IDL)**

**IDL 560  Cancer Biology 3 cr**
This course provides a comprehensive coverage of molecular and cellular aspects of carcinogenesis as well as clinical issues related to human cancer. This course will specifically cover areas of histology, pathology, epidemiology, genetics, viruses, oncogenes and tumor suppressor genes. Additionally, topics to be covered include cellular and molecular basis of chemotherapy, pharmacology of anticancer drugs, molecular and cellular basis of radiotherapy, and biological therapy of cancer and clinical trial design.

**IDL 566  Topics in Cancer Biology 1 cr**
Students and faculty participate in a supervised reading of current literature and meet once a week to interact in a discussion of the selected article. The goal of this course is to maintain the student's level of information at a "state of the art" in both methods and theory in the discipline and to develop critical skills in reviewing the literature.

**IDL 567  Dir Studies in Cancer Biology 1 TO 6 cr**
Students participate in research under the direction of a graduate faculty member. The student may pursue independent research or participate in a literature project.

**IDL 571  Mouse Models Biomed Research 3 cr**
This course utilizes the primary scientific literature to provide students with in-depth knowledge regarding the development and utilization of mouse models in biomedical research. Students are required to actively participate in class discussions, present scientific papers, and develop a research project that utilizes mouse models.

**IDL 576  Interdisciplinary Lit Reports 1 cr**
Students and faculty participate in a supervised reading of the current literature and meet periodically (usually once a week) to interact in a discussion of the selected article or topic. The goal of this course is to maintain the faculty's and students' level of information at a "state of the art" in both methods and theory in the discipline and to develop critical skills in reviewing the literature.

**IDL 577  Intro to Research Methods 3 cr**
Theoretical and practical training in basic skills utilized in basic medical science research laboratories, for students entering the first year interdisciplinary curriculum. Discussion of regulatory issues in biomedical research will be interwoven with hands-on laboratory exercises. Offered concurrently with IDL 580.

**IDL 580  Fund Basic Medical Sciences I 8 cr**
First of a two-semester sequence designed for students in the first year interdisciplinary curriculum. In-depth exploration of the fundamentals of biochemistry, cell biology, and molecular biology prerequisite to advanced study of basic medical sciences. Didactic lectures will be complemented with discussions of the literature.

**IDL 581  Fund Basic Medical Sciences II 8 cr**
Second of a two-semester sequence designed for students in the first year interdisciplinary curriculum. Detailed exploration of the fundamentals of microbiology and immunology, developmental biology, integrative systems physiology, and mechanisms of drug action prerequisite to advanced study of basic medical sciences. Didactic lectures will be complemented with discussions of the literature. Pre-requisite: IDL 580 Minimum Grade of C.

**IDL 590  Sp Top - 1 TO 3 cr**
In-depth tutorial exposure to interdisciplinary topics in Basic Medical Sciences.

**IDL 594  Interdisciplinary Dir Studies 1 TO 6 cr**
Directed research study under the direction of a member of the graduate faculty. This course should be taken by students who have not yet identified a major professor in Basic Medical Sciences.

**IDL 595  Distinguished Scientist Sem 0 cr**
A seminar course in which outside speakers are brought in to discuss their research. Students will attend the seminar and have an opportunity to meet informally with the speaker. Attendance will be required, and the material will be testable during each student's qualifying exam.

**IDL 620  Biomedical Engineering I 4 cr**
Fundamental concepts of medical instrumentation, biomedical imaging and biological systems modeling as used in biomedical engineering. Course is cross-listed with EG 620.
IDL 621  Biomedical Engineering II  4 cr
Fundamental concepts of transport phenomena, cellular and tissue mechanics, and materials as used in biomedical engineering. Course is cross-listed with EG 621.

IDL 630  Lung Biology  4 cr
This course introduces an advanced level of lung physiology. An understanding of fundamental lung development, anatomy, and cell and organ physiology is emphasized. The course consists of lectures and written assignments and essay exams. Reading assignments are from the primary literature.
Pre-requisite: IDL 580 Minimum Grade of C and IDL 581 Minimum Grade of C.

IDL 631  Lung Pathobiology  4 cr
This course builds on an in-depth understanding of normal lung biochemistry, cell biology, pharmacology, and physiology to examine lung disease. Emphasis is given on understanding mechanism(s) underlying the genetic, cell biology, anatomy and physiology of disease development and progression. Current therapeutic interventions are discussed. Clinical correlations are utilized to track signs and symptoms of specified diseases, and provide a framework for treatment options. The course consists of lectures and written assignments and essay exams. Reading assignments are exclusively from the primary literature.
Pre-requisite: IDL 630 Minimum Grade of C.

IDL 635  Advanced Signal Transduction  4 cr
This course builds on signal transduction topics discussed in the Fundamentals course (IDL 580, 581). The mechanisms of more generalized signaling pathways (e.g., G-protein couples pathways) to specific signaling pathways (e.g., TGF/BMP family) will be discussed. Signal transduction pathways will be examined using classic literature references, from the molecular details of pathway components to the effects on the organ-system. The course consists of lectures, student presentations, and essay/problem solving examinations.
Pre-requisite: IDL 580 Minimum Grade of C and IDL 581 Minimum Grade of C.

IDL 640  Stat Exp Design in Biomed Res  2 cr
This course covers statistical analysis, logic and hypothesis-driven experimental design in biomedical research, utilizing a combination of lectures, weekly practical data sets or written assignments, and student presentation.

IDL 641  Effective Scientific Writing  1 cr
This course provides strategies to improve communication skills via construction of logical scientific arguments and effective writing. Course format will include lecture/discussion, in class practical exercises, and writing assignments. In addition, participants will be introduced to the Turnitin software, reference databases, and other electronic resources useful in preparation of proposals and manuscripts.
Pre-requisite: IDL 580 Minimum Grade of C and IDL 581 Minimum Grade of C.

IDL 645  Res Prog Smth Musc/Vasc Blgy  1 cr
Students meet on alternate weeks for 2 hr with faculty and other research professionals to discuss ongoing research projects in the field of smooth muscle and vascular biology. Emphasis will be on up-to-date research results from laboratories as well as newly published literature findings. Students will be expected to present the results of their own laboratory research at least once a year to the group.

IDL 650  Topics in Lung Biology  1 cr
In-depth exposure to selected topics in lung biology or pathobiology. Course may be repeated for credit when course content varies.
Pre-requisite: IDL 630 Minimum Grade of B and IDL 631 Minimum Grade of B.

IDL 655  Research Sem Lung Biology  1 cr
Students and faculty present a research topic for discussion before members of the Center for Lung Biology. The presentations are usually scheduled on a rotational basis. The student may present research data for critique by the faculty.

IDL 667  Cancer Biology Research Sem  1 cr
Students and faculty present a research topic for discussion before members of the department. The presentations are usually scheduled on a rotational basis. The student may present research data for critique by the faculty.

IDL 676  Literature Report Lung Biology  1 cr
Students and faculty participate in a supervised reading of the current literature and meet once a week to discuss the selected article or topic and its relation to ongoing research. The goal of this course is to maintain the faculty's and students' level of information at a "state of the art" in both methods and theory in the discipline and to develop critical skills in reviewing the literature of lung biology.

IDL 799  Research-Dissertation  1 TO 6 cr
Independent research by the student under the sponsorship of the graduate faculty in individual departments in the Basic Medical Sciences. Prerequisite: Approved formal research proposal.

Interdisciplinary Programs (IDS)

IDS 290  Special Topics  1 TO 3 cr
A study of selected topics of an interdisciplinary nature. May be repeated for credit when content varies. Requires permission of instructor.
IDS 490  Special Topics  1 TO 3 cr
Advanced study of selected topics of an interdisciplinary nature. May be repeated for credit when content varies. Requires permission of instructor.

IDS 590  Sp Top  1 TO 9 cr
Specialized topics not generally listed in the course offerings. Requires consent of Graduate Director.

**Interdisciplinary Studies (IST)**

**IST 100  Freshman Seminar**  2 cr
A course for first-time students that assists with maximizing the student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by college life. The course provides an introduction to the nature of higher education and a general orientation to the functions and resources of the University. Extensive reading and writing assignments relevant to the student's first year experience are required.

**IST 101  Foundations of Inter Studies**  3 cr
This course will assist students with clarifying educational goals, understanding effective learning methods, and becoming acquainted with university resources, diversity, and culture. It introduces students to basic theories and principles of education and development, with emphasis on liberal education. The focus is to develop written and oral skills to enhance students' critical thinking and problem solving abilities. Assists students in defining competencies needed for success in academic study, professional leadership, and career opportunities. Students will develop a working knowledge of Sakai, Skype and WebEx.

**IST 105  Encounter with the Humanities**  3 cr
Introduction to the various disciplines within the Humanities with emphasis on the role each plays in a liberal arts education. Identical with CLA 105. Credit cannot be received for both CLA 105 and IST 105.

**IST 110  Encounter the Natural Sciences**  3 cr
Introduction to the various disciplines within the natural sciences with emphasis on the role each plays in a liberal arts education.

**IST 115  Encounter the Social Sciences**  3 cr
Introduction to the various disciplines within the social sciences with emphasis on the role each plays in a liberal arts education.

**IST 120  Encounter Fine Performing Arts**  3 cr
Introduction to the various disciplines within the fine arts with emphasis on the role each plays in a liberal arts education.

**IST 125  Professional Conduct**  3 cr
Introduces students to primary sources in ethical theory and includes readings and discussions of theories of human nature. Provides a basis for understanding one's rationale for personal moral decisions and offers a foundation for an approach to the ethics of business.

**IST 200  Clinical Observation**  1 cr
Clinical Observations (Medicine, Dentistry, Optometry, and Veterinary Medicine). This course gives the student clinical exposure to various health-care services. It is designed to help students make informed decisions when selecting a career in the health professions. A written report on the clinical experience or a scenario dealing with medical ethics is required. May be repeated for a maximum of six hours credit. Prereq: Permission of Chair of Preprofessional Advisory Committee.

**IST 201  Seasons of Life**  3 cr
An interdisciplinary media-assisted course in which students study human development from the biosocial, cognitive, and psychosocial perspectives with special emphasis on the adult years. Through readings, audio, written exercises, and class discussions, students explore the theories and research findings of life span development which enable them to reflect on their own lives as well as the lives of others.

**IST 210  Introduction to Disability**  3 cr
This course will provide students from any discipline the opportunity to develop the knowledge and skills needed to effectively work with people with disabilities in a variety of settings. Disability is examined as a type of diversity. Topics include: the history and sociological context of disability; the impact of disability on the individual and family; advocacy and civil rights; current trends in services and supports for children and adults with disabilities; and respectful language and interaction. Students will actively engage in readings, discussions, and writing on disability issues. Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C.

**IST 215  Career Planning and Develop**  3 cr
Principles, methods, and practice in career planning and development with an emphasis on career information, self-analysis, exploration of careers, career opportunities, and guidelines for goal achievement.

**IST 290  Special Topics -**  1 TO 3 cr
A variable topics course treating special themes. May be repeated for credit when course content varies.

**IST 294  Directed Studies -**  1 TO 3 cr
Directed study of a topic consistent with the student's individualized program under the supervision of a member of the university faculty.
IST 300  Global Orientn-Ed Abroad  1 cr
Study Abroad applicants will prepare for their study abroad experience through an examination of selected country-specific reading as well as cross-cultural orientation materials. Travel safety, University of South Alabama policies and procedures for study abroad, and advice for cultural adjustment will be covered during the course. IST 300 satisfies the requirements of LG 394.

IST 302  Interdis and Critical Thinking  3 cr
Provides students an introduction to the field of interdisciplinary studies and an opportunity to critically reflect on the experience of self, education, and career and the relationship among these three phenomena.

IST 305  Issues in Human Services  3 cr
An interdisciplinary course for students who plan to work in the helping professions (counseling, social work, nursing etc.). Guest speakers from various disciplines present information about their fields. Discussion topics include: similarities and differences in the helping professions, the helping relationship, empathic communication, multicultural and legal issues, and stress and burnout management.

IST 310  Global Leadership  3 cr
This course helps prepare students to assume global leadership roles in their careers and the community at large. Students explore leadership theories and principles as well as investigate leadership qualities among historical and contemporary individuals. In addition, students confront present-day global issues and argue viewpoints orally, as well as through persuasive and technical papers. Students are expected to complete an interdisciplinary project based on global issues.
Pre-requisite: (ACT English 27 or SAT Critical Reading 610 or University - EH101 Exempt P or EH 101 Minimum Grade of C or EH 110 Minimum Grade of C or EH 190 Minimum Grade of C or USA 010 Minimum Grade of S) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

IST 315  Women's Issues in Wrkpl-Comm  3 cr
This course will examine contemporary issues faced by women in the workplace and the community from an interdisciplinary perspective. Some of the topics to be covered are gender communication issues, developing a leadership plan, playing the game, power talk, conflict management from a woman's point of view, international development, and women, sexuality and labor.

IST 320  Cultural Competency  3 cr
An interdisciplinary exploration of issues related to interactions between diverse groups in teams, communities, and organizations. Reviews research from a variety of disciplines, introduces the history and law of equal opportunity in the U.S., and examines the costs and benefits of diversity. Topics include prejudice, stereotyping, affirmative action, barriers to mobility, discrimination, marginalization, mentoring, cooperative teamwork, and international issues.

IST 330  Analytical & Info Lit.-W  3 cr
This course examines principles of qualitative and quantitative research methods and their application to interdisciplinary studies in the social sciences. Emphasis is on the development of functional literacy for information expressed qualitatively and thoughtful integration of such information into academic and practical research.
Pre-requisite: EH 102 Minimum Grade of C or EH 105 Minimum Grade of C.

IST 350  Adv Verbal & Written Comm - W  3 cr
This course builds on the foundation laid in freshman composition, stressing critical thinking, analysis, and research. It aims to prepare students oral presentations, research and writing papers.

IST 401  Adults in Society  3 cr
Adults in Society is a media-assisted course that uses print material, videos, written assignments, and class discussions to explore issues which relate to adult development. Using an interdisciplinary approach, students will examine the relationship of adults to their families, work and communities.

IST 405  Issues Ideas - Humanities  3 cr
Identification and analysis of current concepts and problems in the humanities and their relation to the needs, values, and operation of modern society.

IST 410  Issues and Ideas-Nat Science  3 cr
Identification and analysis of current concepts and problems in the natural sciences and their relation to the needs, values, and operation of modern society.

IST 415  Issues Ideas - Social Sciences  3 cr
Identification and analysis of current concepts and problems in the social sciences and their relation to the needs, values, and operation of modern society.

IST 420  Comm. Dev and Leadership  3 cr
Presents the conceptual foundations of community development and leadership, including basic concepts, methods and literature. Students will study theories of leadership, community development and human capital, investigate public relationships, examine community decision-making and responsible civic action. The course lays foundations for further study and practice in the field. Students will experience the interdisciplinary approaches to community development, leadership, politics, civic responsibility and teamwork.

IST 425  Workplace Learning & Dev  3 cr
This project-based course explores workplace learning and development. It will introduce students to interdisciplinary learning and motivational theories necessary to prepare them to be effective in today's changing workplace, and provide them with the skills to problem-solve, lead and work as part of a team.
IST 430  Senior Research Thesis - W  3 cr
An in-depth research project in the student's concentration. Provides an opportunity for the student to design a comprehensive research project, analyze and synthesize research data, and develop expertise in a particular subject. Pre-requisite: (IST 350 Minimum Grade of D and IST 495 Minimum Grade of D).

IST 450  The Job Campaign  3 cr
Practical approach to career development designed to help students develop strategies for obtaining suitable employment and making career choices. Emphasis is on the principles, methods, and practice in achieving career goals through the study of careers, preparing resumes, writing letters of application, practicing job interview techniques, and identifying prospective employers.

IST 490  Special Topics -  1 TO 6 cr
A variable topics course treating special themes. May be repeated for credit when course content varies.

IST 494  Directed Studies  1 TO 6 cr
Directed Study of a topic consistent with the student's individualized program under the supervision of a member of the university faculty.

IST 495  Prof Leadership & Teamwork  3 cr
Students will examine their skills, abilities, personality, attitudes, values, interests, and behaviors within the context of current scholarship on leadership to increase awareness of their leadership competencies.

IST 498  Internship I-Capstone Exp-W  3 TO 9 cr
This internship course provides the student an opportunity to have an internship filed experience and to reflect on and critically evaluate that internship experience, particularly as it relates to the interdisciplinary course of study. Students will prepare reports, write papers, make presentations, and engage in group discussion that critically considers their internship experience. Pre-requisite: (IST 350 Minimum Grade of D and IST 495 Minimum Grade of D).

IST 499  Honors Senior Thesis - H-W  3 TO 6 cr
A substantial research project reflecting a commitment to genuine scholarship in the student's field of study. Provides an opportunity for the student to design a comprehensive research project, analyze and synthesize research data, and develop expertise in a particular subject. Fulfills the senior project requirement for the honors program.

IST 500  Global Orientn-Ed Abroad-Grad 0 TO 1 cr
This is a pre-departure academic and orientation process course for all graduate students who plan on studying abroad in terms following their participating in this course. This course will facilitate the application, academic advising, pre-departure advising, and activities related to getting students ready for participation in their actual program abroad.

International Studies (IS)

IS 100  Global Issues  3 cr
This course introduces students to the basic structural components of the global system, including the nation-state system and the world economy, and explores the major schools of thought in such areas as security, economic prosperity and development, international law, gender and environmental studies. The course helps students understand the complex and interlinked issues facing global society, and current problems, and view the U.S. within a broader global context.

IS 193  Study Abroad  1 TO 6 cr
This course is an introductory International Studies course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.

IS 200  People-Nations -  3 cr
Variable content course focusing on particular nation or region of the world. Course offers a multi-disciplinary introduction to the people, society and politics. May be repeated for credit when content varies up to a total of 6 hours.

IS 210  Global Engagement Orientation  1 cr
This course introduces students to international global issues, allows students to identify opportunities for active engagement in these issues, and provides the framework for successful completion of the Global Engagement Certificate.

IS 290  Special Topics -  3 cr
Study of selected topics within a particular Area Studies Concentration. May be repeated for credit when content varies. Pre-requisite: IS 100 Minimum Grade of D.

IS 293  Study Abroad  1 TO 6 cr
This course is an introductory International Studies course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.

IS 363  Crime and Politics in LatinAm  3 cr
An examination of the violent crime epidemic affecting many parts of Latin America, with specific focus on the themes of democratic transition, political economy, and foreign relations with the United States. Same as PSC 363 and CJ 363. Pre-requisite: (PSC 130 or CJ 105 or IS 100 ).

IS 390  Sp Top-  1 TO 3 cr
Advanced study of selected topics within a particular concentration. May be repeated for credit when content varies.

IS 391  Study Abroad -  0 TO 18 cr
Study of selected topics within a particular Area Studies Concentration. May be repeated.
### IS 393 Study Abroad 1 TO 6 cr
This course is an advanced International Studies course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.

### IS 401 Global Engagement Capstone 1 cr
Global Engagement Capstone is required for students completing the Global Engagement Certificate (GEC), and is a one hour course designed to help students reflect on the 16 hours of coursework and nine hours of globally engaged activities they have completed. Students will create a portfolio during the course, which will be presented to students and affiliated faculty at its conclusion. Pre-requisite: IS 210 Minimum Grade of P.

### IS 489 Leadership and World Leaders 3 cr
An overview of the definitions, characteristics, and typologies of leadership, with a focus on lives and legacies of global influential political leaders over the past century. Pre-requisite: PSC 130 Minimum Grade of D or PSC 250 Minimum Grade of D or IS 100 Minimum Grade of D.

### IS 490 Special Topics 3 cr
Advanced study of selected topics within a particular Area Studies Concentration. May be repeated for credit when content varies. Pre-requisite: IS 100 Minimum Grade of D.

### IS 491 Seminar on Terrorism 3 cr
This course will introduce students to the meaning, characteristics, typology, history, and causes of terrorism. The course will also summarize the biographies of the most prominent terrorists, past and present, and conclude, with a discussion of counter-terrorism strategies. Cross-listed with PSC 491. Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C and IS 100 Minimum Grade of C.

### IS 492 Seminar - 3 cr
Advanced study of selected topics in international studies from a comparative perspective. May be repeated for credit when content varies. Pre-requisite: IS 100 Minimum Grade of D.

### IS 493 Study Abroad 1 TO 6 cr
This course is an advanced International Studies course taught as part of a faculty-led study abroad program. Topics and credit hours vary based on availability.

### IS 494 Directed Studies 1 TO 3 cr
Directed research in the field of international studies. May be repeated or credit up to a total of 9 hours. Prerequisite: permission of IS Director.

### IS 495 Senior Seminar - W 3 cr
The course seeks to provide an interdisciplinary and cross-regional overview of the fields and research opportunities within international studies. Pre-requisite: EH 102 Minimum Grade of C.

### IS 496 Prof St Internship - 3 TO 9 cr
Practical learning experiences through occupational or professional work with an approved international organization, governmental agency, or international business. Pre-requisite: Permission of IS Director.

### IS 499 Senior Honors Thesis 3 cr
The course covers major theoretical perspectives in organizational psychology based on empirical research and case studies. Students will explore learning theory, group dynamics, and change in different types of learning organizations. Pre-requisite: (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D).

### IS 591 Study Abroad 0 TO 12 cr
Graduate level international exchange programs for University of South Alabama students.

### Jewish And Holocaust Studies (JHS)

#### JHS 101 Intro to Jewish Studies 3 cr
This course is a requirement for all Jewish & Holocaust Studies minors and will introduce students to methods, questions, and concerns within these fields. Students will be provided with an overview of Jewish history as well as how Jewish history first came to be an historical field of inquiry. Students will also be given an overview of the Holocaust, other genocides, and genocidal violence. Students will then be introduced to various approaches in Jewish and Holocaust Studies. This course will help students formulate ideas for research topics related to the class and will show them how and why a Jewish & Holocaust Studies minor may be able to help them in future endeavors.

### Kinesiology (KIN)

#### KIN 100 Concepts of Health and Fitness 3 cr
An introductory course designed to show students to contributions of physical activity, nutrition, weight control, stress control, environmental conditions, and injury prevention to preventive health. Students learn how to evaluate themselves, their physical and nutritional needs and how to design individual programs for healthy living.

#### KIN 166 Movement-Rhythms and Dev Act 3 cr
Movement exploration experiences, developmental games, rhythmic and dance activities are explained, developed and practiced. Clinical or field experience required.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>KIN 201</td>
<td>Orientation to Kinesiology</td>
<td>3 cr</td>
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<tr>
<td>KIN 231</td>
<td>ARC Lifeguard Training</td>
<td>3 cr</td>
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<tr>
<td>KIN 278</td>
<td>Sport and Human Behavior</td>
<td>3 cr</td>
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<tr>
<td>KIN 282</td>
<td>Intro to Athletic Training</td>
<td>3 cr</td>
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<tr>
<td>KIN 351</td>
<td>Sports Skills</td>
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<tr>
<td>KIN 370</td>
<td>Basic Motor Learning</td>
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<tr>
<td>KIN 372</td>
<td>Coaching Gymnastics</td>
<td>3 cr</td>
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<td>KIN 373</td>
<td>Coaching Volleyball</td>
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<td>KIN 374</td>
<td>Coaching Soccer</td>
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<td>KIN 375</td>
<td>Coaching Football</td>
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<td>KIN 376</td>
<td>Coaching Basketball</td>
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<td>KIN 377</td>
<td>Coaching Baseball</td>
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<td>KIN 378</td>
<td>Coaching Track and Field</td>
<td>3 cr</td>
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<tr>
<td>KIN 380</td>
<td>Kinesiology</td>
<td>3 cr</td>
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<tr>
<td>KIN 381</td>
<td>Eval and Measurement in HPE</td>
<td>3 cr</td>
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<tr>
<td>KIN 429</td>
<td>School Lab Experience-PE</td>
<td>0 TO 3 cr</td>
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<tr>
<td>KIN 450</td>
<td>Student Teaching-Hlth and PE</td>
<td>9 cr</td>
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<tr>
<td>KIN 452</td>
<td>Methods of Teaching PE-W</td>
<td>3 cr</td>
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<tr>
<td>KIN 456</td>
<td>Student Teaching Secondary</td>
<td>1 TO 9 cr</td>
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<tr>
<td>KIN 461</td>
<td>PE for Atypical Child-Youth</td>
<td>3 cr</td>
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An overview of the field of Health, Physical Education, and Exercise Science. An introduction to the Department of HKS followed by survey of philosophical and historical aspects, and professional preparations standards of the specific fields.

Prepares the student for American Red Cross Lifeguard, CPR for the professional rescuer, and first aid certification. Emphasis is placed on emergency action plans, lifeguarding techniques and all forms of victim rescue. Prerequisites: Strong swimmers ONLY.

A study of the psychological and sociological aspects of sport and the relationship to human behavior.

Survey of the basic techniques and practices of athletics training. Study includes prevention, recognition, care, and treatment of athletic injuries. Development of basic athletic training skills in the use of preventive and protective techniques of adhesive tape applications.

The development of skills and the understanding of fundamentals and strategies in selected individual, dual, and team sports. Field experiences required. Proof of background check, fingerprinting and liability insurance is required. PE (P-12) majors only. Instructor permission is required.

Study of the psychological, experimental, and social aspects of learning in the psychomotor domain.

History, theory, and fundamentals of coaching and officiating gymnastics.

History, theory, and fundamentals of coaching and officiating volleyball.

History, theory, and fundamentals of coaching and officiating soccer.

History, theory, and fundamentals of coaching and officiating football.

History, theory, and fundamentals of coaching and officiating basketball.

History, theory, and fundamentals of coaching and officiating baseball.

History, theory, and fundamentals of coaching and officiating track and field.

Theory and application of the mechanical and anatomical principles of human movement.

Statistical procedures, evaluation, and interpretation, and use of tests and other measurement devices in health and physical education.

Professional laboratory experiences involving observation and participation at local public schools. Admission to teacher candidacy required.

Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the 6-12 Health Education and P-12 Physical Education programs. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Admission to teacher candidacy and completion of program and college prerequisites required.

Organizing materials and developing methods of teaching physical education in elementary, middle, and high schools. Field experiences required. Practical mini-teaching experiences in peer labs and local schools. Prerequisite: Admission to teacher candidacy. Co-requisite: KIN 429.

Observation and supervised teaching with opportunity for study and discussion of problems encountered in secondary schools. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Admission to teacher candidacy and completion of program and college prerequisites required.

Principles and techniques for adapting physical education activities for children with special needs. Field experience required.
KIN 470  Student Teaching P-12 Program  1 TO 12 cr
Observation and supervised teaching with opportunity for study and discussion of problems encountered in the P-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Admission to teacher candidacy and completion of program and college prerequisites required.
Pre-requisite: PRAXIS-Phys Edu Cont Knowledge 149 and KIN 351 Minimum Grade of C and KIN 452 Minimum Grade of C and KIN 460 Minimum Grade of C.

KIN 473  Problems in Health and PE  3 cr
Special problems in health and physical education are assigned to individuals and to groups of students.
Pre-requisite: PRAXIS-Phys Edu Cont Knowledge 149 and KIN 351 Minimum Grade of C and KIN 452 Minimum Grade of C and KIN 460 Minimum Grade of C.

KIN 474  Sport and Fitness Conditioning  3 cr
Study of the theory, principles, methods, and techniques in the development, implementation, and evaluation of various strength and conditioning programs designed to enhance athletic performance and improve physical fitness. The conditioning needs of various populations with disease and degenerative conditions will be examined.

KIN 475  Org-Admin Hlth and PE-W  3 cr
Planning, policies, administrative/management functions and duties in health and physical education programs.

KIN 476  Exercise Physiology  3 cr
The study of the body's physiological responses and adaptations to exercise and training.
Pre-requisite: BMD 114 Minimum Grade of D or BMD 110 Minimum Grade of C or BMD 251 Minimum Grade of C.

KIN 477  Water Safety Instructor  3 cr
Trains prospective candidates for American Red Cross Water Safety Instructor certification. Candidates will learn how to teach all levels of swimming and basic diving to students of all ages. How to organize classes, use lesson plans and practice teaching skills. Prerequisite: Proficient swimmer in all seven strokes. See Instructor for specific skill requirements.

KIN 478  Coaching Theory  3 cr
Introduction to profession of coaching. Topics include: physical, mental and organizational preparation, teaching strategies (individual and team aspects), legal liability, officiating, and national guidelines.

KIN 479  Fit Assess-Exercise Prescript  3 cr
Through didactic study and laboratory participation, the student will develop to knowledge base and clinical skills to assess physical fitness and plan exercise prescriptions for apparently healthy individuals.
Pre-requisite: KIN 476 Minimum Grade of D or PE 476 Minimum Grade of D.

KIN 480  Therapeutic Exercise  3 cr
Theory, current research, principles, application and techniques of rehabilitation used to treat injuries to athletes and the physically active across the life span are studied. Psychological and physical parameters of rehabilitation and exercise conditioning are presented.

KIN 482  Advanced Athletic Training  3 cr
Advanced and contemporary topics, issues, and applications in athletic training. Admission to candidacy required.
Pre-requisite: KIN 380 Minimum Grade of D.

KIN 484  Apps in Sports Conditioning  3 cr
Through didactic study and physical activity participation, the student will develop the knowledge base and skills in fundamental and advanced exercise theory and techniques in sport and fitness conditioning with application to program design and periodization of training.
Pre-requisite: KIN 474 Minimum Grade of D or PE 474 Minimum Grade of D.

KIN 486  Advanced Exercise Physiology  3 cr
Detailed analysis of the underlying principles of the physiological and biochemical responses of the human body to exercise and adaptations to exercise training.
Pre-requisite: PE 476.

KIN 490  Special Topics  3 cr
A varying content course treating different aspects of health, kinesiology, and sport. May be repeated for credit when courses content varies.

KIN 494  Directed Studies  1 TO 3 cr
Directed research and/or project. No more than two directed studies can be counted towards the bachelor's degree, HKS advisor approval required.

KIN 495  Internship  1 TO 12 cr
Observation and supervised practicum experiences in a professional setting. May be repeated for credit not to exceed 12 hours. HKS advisor approval required.

KIN 499  Senior Honors Thesis-H  3 TO 6 cr
Experiences in planning, conducting, and reporting a research project relevant to the fields of Health, Kinesiology, and Sport. The project, mentored by HKS faculty, is required for Honors recognition and may be repeated for up to six credit hours. Prerequisites: Participant in Honors Program and approval of Department and Project Chairs required.

KIN 500  Admin of Hlth & Phys Ed & Sprt  3 cr
A study of the principles, techniques, and methods used in management and supervision of health and physical education and sport in schools and colleges.

KIN 503  Evaluation of Teach and Learn  3 cr
Measurement and evaluation of student progress and teaching effectiveness in the psychomotor domain.
KIN 505  Crit Read-Write Content Field  3 cr
Discussion of critical issues and outstanding research in the
fields of Health, Kinesiology, and Sport, with opportunities
for class interaction and critical examination of ideas.

KIN 506  Physical Education Curriculum  3 cr
An overview of the physical education curriculum, its
foundations, critical issues, and modern trends. It explores
curriculum content areas of scheduling administration,
teaching methods, and various standards and procedures
for evaluation.

KIN 516  Exercise Physiology  3 cr
Advanced study of the theories, current research, and
underlying principles of the physiological responses and
adaptations of the human body to exercise and training.

KIN 521  Motor Learning  3 cr
Theories and applications of the foundations of learning
motor skills and presented.

KIN 530  Seminar in Health and Phys Ed  3 cr
Professional growth through in-depth experiences in the
presentation of problems and formal papers, with emphasis
on guided discussions and research criticism.

KIN 540  Cardiovas Resps Adapt Excerc  3 cr
Concentrated study of cardiovascular and respiratory
systems including their structure, regulation, and integration
with emphasis on physiological responses and adaptations
to exercise and training, optimization of performance,
overtraining and environmental influences, and aerobic
exercise program design.

KIN 550  Perceptual-Motor Dev Children  3 cr
Designed to give the classroom teacher, special educator
and physical educator a background in perceptual-motor
development and training in infants and children.

KIN 570  Stress Testing-Ex Prescription  3 cr
The development of competencies necessary to administer
graded exercise tests and prescribe appropriate exercise
programs for various populations, based upon clinical
observations and physiological data.

KIN 571  Exer Mgt Chronic Disease/Disab  3 cr
This course is designed to provide a problem-oriented
approach to exercise testing and prescription/programming
for special needs populations.

KIN 572  Applic of Biomech Concepts  3 cr
An examination of the relationship of fundamental
anatomical and mechanical principles of human movement
as applied to sport performance, fitness, and injury
prevention through observation of common activities.

KIN 574  Sport and Fitness Conditioning  3 cr
Advanced study of the scientific theory, principles, methods,
and techniques in the development, implementation, and
evaluation of various strength and conditioning programs
designed to enhance athletic performance. Instructor
permission is required.

KIN 579  Fitness Assessment-Exer Presc  3 cr
Fitness Assessment and Exercise Prescription reviews the
advanced principles of exercise testing and prescription
for at risk and health adult populations including health
appraisal, risk assessment, and interpretation of data.
Assessment results are utilized in designing training
programs and recommending lifestyle changes for
enhancing health, fitness, and performance. The ACSM
Exercise Guidelines are emphasized. This course is dually
listed with an equivalent 400 level course (KIN 479).
Instructor permission is required.

KIN 590  Special Topics-  3 TO 6 cr
A varying-content course treating various aspects of health,
kinesiology, and sport. May be repeated for credit when
course content varies.

KIN 594  Directed Study and Research  1 TO 3 cr
Students explore, through directed study and research,
problems and issues of special interest or significance
in Health, Kinesiology, and Sport. Not more than three
semester hours of any departmental 594 courses can be
accepted toward a degree program.

KIN 595  Internship  3 TO 6 cr
A supervised learning experience in a health, kinesiology,
or sport setting. Provides the student an opportunity to
apply theories and concepts learned during the graduate
program. No more than six semester hours may be taken.
HKS advisor approval required.

KIN 599  Thesis  1 TO 9 cr
A student selects a project, study, or investigation in
health and/or kinesiology. Such project forms the basis
for the thesis. A committee will give guidance during the
investigation and the writing of the thesis.

KIN 601  Biomech Found Human Movement  3 cr
This course is designed to provide students with an
understanding of how to use various technologies in a
biomechanics lab for measuring kinematics. Along with
making measurements, students will also learn how to
perform the calculations involved in analysis.

KIN 602  Techniques of Supervision PE  3 cr
Course is designed to familiarize the student with
the principles, problems, and techniques, involved in
supervision.

KIN 603  Adv Measurement-Eval in HKS  3 cr
Measurement and evaluation in the areas of strength, body
composition, flexibility, endurance, general motor capacity,
perceptual motor-functions, and anthropometrics.

KIN 694  Directed Study and Research  1 TO 3 cr
Through directed study and research, problems and
issues of special interest or significance in health and/or
kinesiology are explored. No more than three semester
hours of any department 694 courses can be accepted
toward a degree program.
KIN 695  Internship  3 TO 9 cr
A supervised field study investigation in a candidate’s work setting. The student will conduct an investigation, apply concepts and skills learned during the program.

KIN 699  Research Project  1 TO 6 cr
A supervised research project or investigation in instructional development. The student will conduct an investigation, apply concepts and skills learned during the sixth-year program. May be taken more than one semester; total cannot exceed six semester hours.

Leadership And Teacher Educ (LTE)

LTE 645  Curriculum Leadership  3 cr
A purpose of this course will be to prepare professional educators through teaching, research and services to become committed to life-long learning and to facilitating the process of building better communities.

LTE 646  Community Leadership  3 cr
This course will prepare future teacher leaders to work effectively within their school community as well as with the communities in which they work and with the families of the students they teach.

LTE 647  Instructional Coaching  3 cr
A purpose of this course is to prepare professional educators through teaching, research, and service to become committed to life-long learning and to facilitate the process of building better communities. Students will demonstrate best educational practices and professional dispositions and will learn how to create a positive, motivational learning environment in schools while recognizing, appreciating, and including diverse learners and perspectives. Additionally, students are expected to demonstrate satisfactory skills in curriculum leadership; to engage in action research related to schools; to engage in literacy coaching; to address current family, community, regional, and national issues related to scholastic achievement, and to use tenets of instructional leadership to guide teachers and other professionals toward improving student achievement.

LTE 699  Research Project  1 TO 3 cr
The Research Project, as the culminating experience in the Instructional Specialist Program, provides the candidate an opportunity to synthesize and apply program components and a timely topic in the field.

Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

Leisure Studies (LS)

LS 191  Intro to Leisure Studies  3 cr
An introduction to the Leisure Services profession; its history, philosophies, and the psychology of leisure in the changing society. Includes an orientation to community leisure agencies.

LS 194  Leisure Crafts  3 cr
Adapting various crafts media for use in recreational programs. Design and execution of creative crafts with emphasis on use of indigenous materials.

LS 276  Introduction to Sport Mgt  3 cr
A study of the activities, organizations, and businesses involved in producing, facilitating, and organizing sport, fitness, and recreation related products and services.

LS 280  Hospitality Services  3 cr
A study of hotel/motel resort services. Includes an overview of recreation services, food and beverage, guest services, marketing, housekeeping, maintenance, and fiscal concerns.

LS 292  Outdoor Recreation-Adventure  3 cr
A classroom introduction to a wide range of outdoor recreation pursuits with an emphasis on safety, minimum impact, and "how to get started" in outdoor activities like backpacking, canoeing, rafting, car camping, hiking, and others.

LS 295  Intro to Therapeutic Rec  3 cr
Introduces students to the field of therapeutic recreation including the history, foundations, and philosophy of the field. In addition, characteristics and leisure needs of numerous special populations will be introduced.

LS 297  Campus Recreation  3 cr
Planning, organization, and leadership of intramural recreation and community sport activities.

LS 298  Practicum in Ther Rec  3 cr
Supervised practical experience that provides observation, participation, and application of therapeutic recreation and leisure studies concepts. Includes classroom instruction and exploration of career opportunities. Minimum 90-hours of practical experience required.

LS 300  Global Tourism  3 cr
Examination of the impact of recreational socio-cultural, economic, physical environment and governmental factors on leisure travelers within the global tourism industry.
LS 375  Mgmt in Therapeutic Recreation  3 cr  
Management and organization of therapeutic recreation programs including professional and agency standards, staff development, internship and credential requirements, fiscal planning, continuous quality improvement, equipment maintenance, advocacy, and public relations. Pre-requisite: LS 295 Minimum Grade of D.

LS 384  Sports Marketing  3 cr  
An examination of marketing and media concepts and theories applied to the sport industry. Content areas include basic marketing, target marketing and segmentation, advertising and sponsorships, event marketing and promotions, branding, public relations, social media, consumer behavior research, sponsorship proposals, and sport marketing plans.

LS 391  Leadership in Leisure Studies  3 cr  
Theories, principles, and philosophies of leadership as applied to the delivery of leisure services. Also includes a study of programming principles and techniques.

LS 394  Sport Business and Finance  3 cr  
This course provides undergraduate students with an introduction to investment valuation and key financial concepts of sport related entities. Students will develop revenue generating insight and budgeting knowledge of actual situations occurring in the sport and recreation industry. Topical areas covered include capital budgeting, facility financing, corporate sponsorship, salary structures, franchise valuations, and personal business transactions.

LS 395  Therapeutic Rec Process (W)  3 cr  
This course introduces the comprehensive program planning process and the elements of assessment and documentation in a variety of therapeutic recreation service settings. A field work component may be required. Pre-requisite: LS 295 Minimum Grade of D.

LS 397  Intergenerational Rec/Wellness  3 cr  
This course is an intergenerational experience combining theory and practice in aging and recreation. Students utilize the therapeutic recreation process (assessment, program planning, implementation and evaluation) with older adults who have special needs, to promote health, wellness, and rehabilitation.

LS 465  TR Prog Des & Interventions I  3 cr  
This course provides an examination of Therapeutic Recreation interventions and the role of research and theory in influencing practice. Course topics include: activity analysis, programming techniques, scope of service, intervention descriptions, historical perspectives, current research, and theoretical foundations related to TR intervention. A field work component of 40 hours is required that will allow students to gain experience implementing TR programs. Pre-requisite: LS 295 Minimum Grade of D and LS 298 Minimum Grade of C.

LS 466  TR Prog Des & Interventions II  3 cr  
This course examines modalities and issues in therapeutic recreation practice with the primary emphasis on leisure education, scope of service, nature of populations served, systematic programming, activity analysis and documentation of results. The course also addresses contemporary problems and issues in therapeutic recreation, and acquiring knowledge of medical terminology and therapeutic drugs. Pre-requisite: LS 295 Minimum Grade of D and LS 298 Minimum Grade of C.

LS 467  TR for Phys Disabilities  3 cr  
This course will familiarize the student with the etiology, characteristics, and course of treatment provided to individuals with various physically disabling conditions, and promote awareness of the role of therapeutic recreation in the physical rehabilitation process. A field work component of 40 hours is required.

LS 468  Facilitation Techniques in TR  3 cr  
Study of the concepts and intervention techniques used in the application and process aspects of therapeutic recreation. Content includes evidence-based practice, planning and leading interventions, instructional techniques, counseling theory and practice, implementing groups, communication techniques, and facilitation techniques. A practical leaning component is included.

LS 469  TR for Psych Impairments  3 cr  
This course will familiarize students with etiology, characteristics, and course of treatment provided to individuals with psychological impairments and developmental disabilities and promote awareness of the role of therapeutic recreation in the habilitation/rehabilitation process. A field work component of 40 hours is required.

LS 471  Evaluation & Research in LS-W  3 cr  
This course offers an overview of the research and evaluation process in recreation and leisure studies. The first part of the course will emphasize the scope, meaning, and basic concepts of scientific research including aspects of research design. The second part of the course will focus on the application of the basic skills in a practical context in the environment of leisure studies.

LS 472  Legal Issues in Sports/Rec - W  3 cr  
This course introduces students to the legal liabilities, negligence, contractual agreements, and risk management issues pertaining to the areas of sport, recreation, and physical activity.

LS 479  Leisure and Aging  3 cr  
This course will provide an overview of the changes affecting the psychomotor, cognitive and affective domains of the aged; implications of leisure and retirement; and institutional and community settings that provide leisure services for the older adult.
LS 480  Private and Commercial LS  3 cr
A survey of private and commercial leisure service operations including a study of resort operations.

LS 481  Tourism & Resort Development  3 cr
Tourism and recreational travel, nature of resort development and its effect on generating tourist flow to and within regions. Economic importance of both tourism and resort development.

LS 483  Issues in Leisure Studies  3 cr
A study of major trends, problems, and issues in various areas of Leisure Services.

LS 486  Sport/Rec Facility Plan/Design  3 cr
This course will familiarize students with the basic methodologies, objectives, and principles applied to the design and strategic planning of sport and recreation service facilities. It includes the examination and implementation of guidelines used to create a facility planning brief.

LS 490  Special Topics  3 cr
Selected topics in leisure studies. Topics will vary according to needs and interests of students. Course may be repeated for credit when content varies.

LS 492  Outdoor Ed and Interpretation  3 cr
Theories, philosophies, and principles of outdoor education with emphasis on the development of interpretive programs.

LS 496  Sport and Rec Resource Mgt  3 cr
A study of event and facility resource management in sport and recreation. Applies the functions of management to the supervision, operation, development, evaluation, and financing of sport and recreation facilities in public and private environments.

LS 498  Internship in Leisure Studies  0 TO 12 cr
Supervised experiences in an assigned leisure studies or related agency. HPELS advisor approval required.

LS 569  Leisure and Society  3 cr
An exploration of the economic, religious, political, and socio-cultural factors which influence leisure behavior in modern society.

LS 570  Procedures in TR I  3 cr
Procedures in Therapeutic Recreation I was designed to prepare the graduate student for the more complex areas of present day professional issues and service provision including: an in-depth analysis of historical and philosophical influences, therapy and facilitation techniques, quality management, ethics, standards of practice, clinical supervision, healthcare reimbursement and professional credentialing.

LS 571  Procedures in TR II  3 cr
This course is designed to familiarize the graduate student with the therapeutic recreation process. Content areas will include analysis of assessment procedures, sources and processes, treatment planning, interdisciplinary procedures, medical record documentation, activity-based interventions, and evaluation of program effectiveness.

LS 573  Issues and Trends in LS  3 cr
An in-depth examination of current issues and trends in leisure studies with respect to their impact on the profession and society.

LS 576  Conceptual Foundations of TR  3 cr
Designed to introduce the student to the field of therapeutic recreation including philosophy, history, current issues and trends, administration and program development. The course will also provide an overview of various disabling conditions.

LS 580  Internship in Leisure Studies  3 TO 9 cr
An individually planned practicum experience in an approved leisure studies setting. Requires a minimum of 150 work hours per 3 hours of credit. HPELS advisor approval required.

LS 585  Mgmt in Leisure Studies  3 cr
An in-depth examination into the research, foundations, and functions in the delivery of leisure services, including current practices in management of fiscal procedures, budgeting, and grants.

LS 590  Sp Top -  3 cr
A varying-content course treating various aspects of Leisure Studies. May be repeated for credit when course content varies.

LS 591  Travel and Tourism  3 cr
A survey course designed to provide students with an overview of travel and tourism as an area of study. Discussions will center on tourism at the macro (regional and national) level. Tourist behavior, the social, environmental and economic impact of tourism will be highlighted.

LS 592  Outdoor Rec - Adventure Prog  3 cr
Study and practicum in popular adventure activities (e.g., shooting sports, angling, backpacking, orienteering, rock climbing, canoeing). Emphasis on attitudes, skills, environmental awareness, teaching methodology, and principles of group leadership as they relate to adventuresome activities.

LS 596  Special Projects  3 cr
An individually planned experience whereby a student conceptualizes and researches a special problem relevant to the leisure services profession. Students will share their experiences in a weekly seminar (non-thesis option).
Linguistics (LNG)

LNG 300 Intro to Linguistics 3 cr
LNG 300-Introduction to Linguistics is the introductory class for the Applied Linguistics minor. It will introduce linguistics concepts to the students and give them the foundation needed for the higher level classes required as part of the minor. Required core course. Prerequisite: Sophomore standing.
Pre-requisite: (LG 201 Minimum Grade of C and LG 202 Minimum Grade of C) or (LG 211 Minimum Grade of C and LG 212 Minimum Grade of C) or (LG 231 Minimum Grade of C and LG 232 Minimum Grade of C) or (LG 241 Minimum Grade of C and LG 242 Minimum Grade of C) or (LG 251 Minimum Grade of C and LG 252 Minimum Grade of C) or (LG 271 Minimum Grade of C and LG 272 Minimum Grade of C) or (LGS 201 Minimum Grade of C and LGS 202 Minimum Grade of C) or (LGS 206 Minimum Grade of C and LGS 207 Minimum Grade of C) or (LGS 210 Minimum Grade of C and LGS 211 Minimum Grade of C) or (LGS 221 Minimum Grade of C and LGS 222 Minimum Grade of C) or (LGS 241 Minimum Grade of C and LGS 242 Minimum Grade of C) or (LGS 261 Minimum Grade of C and LGS 262 Minimum Grade of C) or (LGS 281 Minimum Grade of C and LGS 282 Minimum Grade of C). LG 201 and LG 202 and LG 211 and LG 212 and LG 231 and LG 232 and LG 241 and LG 242 and LG 251 and LG 252 and LG 271 and LG 272 and LGS 201 and LGS 202 and LGS 206 and LGS 207 and LGS 210 and LGS 211 and LGS 221 and LGS 222 and LGS 241 and LGS 242 and LGS 261 and LGS 262 and LGS 281 and LGS 282 can be taken concurrently with this course.

LNG 305 History of Euro Languages 3 cr
LNG 305-History of European Languages is an elective class for the Applied Linguistics minor. It will introduce students to the emergence and development of the European Languages as we know them today, tracing their historical development from the beginning to the modern era. Elective course. Pre-requisite: LNG 300 Minimum Grade of C.

LNG 306 Contemporary Poetry and Trans 3 cr
In this course, students will broaden their knowledge of contemporary poetry in either the Chinese, French, German, Russian or Spanish language and become conversant with translation theory. They will also begin to work towards expertise in the translation of this poetry into English. Pre-requisite: LG 212 Minimum Grade of C or LG 232 Minimum Grade of C or LG 252 Minimum Grade of C or LG 272 Minimum Grade of C or LG 273 Minimum Grade of C.

LNG 400 Applied Linguistics 3 cr
LNG 400- Applied Linguistics is the second linguistics class for the Applied Linguistics minor. It will introduce Second Language Acquisition theory and concepts to the students and give them the theoretical foundation needed for the minor. This is the last required class of the Applied Linguistics minor. Required core course. Pre-requisite: LG 300 Minimum Grade of C. LG 300 can be taken concurrently with this course.

LNG 465 Foreign Lang Pedagogy 3 cr
LNG 465-Foreign Language Pedagogy is an elective class for the Applied Linguistics minor. It will introduce students to the theories and methodologies of the surrounding second language instruction, tracing their historical development of these methodologies from the beginning to the modern era. Elective course. Special Permission of the Instructor required to enroll in course. Pre-requisite: LNG 300 Minimum Grade of C and LNG 400 Minimum Grade of C.

LNG 490 Special Topics- 3 cr
LNG 490-Special Topics is an elective class for the Applied Linguistics minor. A variety of topics can be covered in this class as determined by student interest and the discretion of the Director of Applied Linguistics Program. Elective course. LNG 300 and LNG 400 with a C or better. Pre-requisite: LNG 300 Minimum Grade of C and LNG 400 Minimum Grade of C.

LNG 494 Directed Studies- 3 cr
LNG 494 - Directed Studies is an elective class for the Applied Linguistics minor. A variety of topics can be covered in this class as determined by student interest and the discretion of the Director of Applied Linguistics Program. Elective courses. Pre-requisite: LNG 300 Minimum Grade of C and LNG 400 Minimum Grade of C.

LNG 496 Intern. Applied Ling 3 cr
LNG 496 - Internship in Applied Linguistics is an elective class for the Applied Linguistics minor. Allows Applied Linguistics students the opportunity for hands-on practice of the theories and methodologies learned as part of the Applied Linguistics minor. Elective course. Pre-requisite: LNG 465 Minimum Grade of C.

Management (MGT)

MGT 300 Management Theory and Practice 3 cr
Theories of organizational structures, practices, and behavior, and the effective management of organizations. Emphasis on developing patterns and strategies of organizational management in a dynamic environment as affected by the interaction of material and human resources using the technique of applied social and management sciences.
MGT 305 Organizational Comm - W 3 cr
A study of written and oral communication of organizations. Emphasis is given to communication theory, including organization flows and barriers to organizational communication. The preparation of neutral, negative, and persuasive written messages as well as formal written reports is covered in depth. In addition, oral presentations and employment interviews are discussed.
Prerequisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MGT 311 Legal Environ of Bus II 3 cr
An advanced treatment of the law of agency, commercial transactions, business organizations, property, negotiable instruments, secured transactions, professional liability, debtor-creditor relations, including applicable sections of Uniform Commercial Code.
Prerequisite: BUS 265 Minimum Grade of D or (MGT 310 Minimum Grade of D or BMS 422 Minimum Grade of D or MGT 332 Minimum Grade of D or MGT 422 Minimum Grade of D).

MGT 325 Operations Management 3 cr
Addresses concepts, problems, and managerial approaches applicable to the management of manufacturing and service operations. The course will examine the strategic and tactical considerations that are involved in creating a systematic framework that supports the creation of competitive advantages through effective operations and the production of high quality products. Topics covered include the role of operations in the overall organization, operations strategy development and implementation, product design and process selection, location and capacity planning, facilities layout, quality management, inventory management, production planning, scheduling and control, and project management. An important component of the overall course is the incorporation of computer applications for problem solving and decision making in operations.
Prerequisite: (MGT 300 Minimum Grade of D or BMS 322 Minimum Grade of D or MGT 322 Minimum Grade of D) and (BUS 255 Minimum Grade of D or BMS 250 Minimum Grade of D or BMS 255 Minimum Grade of D or BMS 300 Minimum Grade of D or ST 275 Minimum Grade of D).

MGT 334 International Mgt 3 cr
This course exposes students to the challenges that confront the managers of organizations & individuals in global settings. Special focus is on dealing with and benefitting from the diversity that exists across international cultures, markets, economics, governments, and organizations.
Prerequisite: MGT 300 Minimum Grade of D or MGT 322 Minimum Grade of D.

MGT 340 Organizational Behavior - W 3 cr
A study of human and group behavior in the workplace and within society. The focus is on individual characteristics and processes such as personality, perception, and motivation; interpersonal processes such as group behavior, leadership, communication, and decision making; and organizational processes such as culture, structure, power, and change.
Prerequisite: Junior Standing.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (MGT 300 Minimum Grade of D or BMS 322 Minimum Grade of D or MGT 322 Minimum Grade of D) and (MGT 305 Minimum Grade of D or MGT 324 Minimum Grade of D).

MGT 341 Organizational Behavior 3 cr
This course provides a basic survey of the field of Organizational Behavior. Our objective is to cover important topics such as job attitudes, work motivation, group dynamics, leadership and organizational culture.
Prerequisite: (MGT 300 Minimum Grade of D or MGT 305 Minimum Grade of D).

MGT 345 Creativity and Innovation 3 cr
This course provides a broad framework for understanding the nature of entrepreneurship in multiple organizational settings. The course introduces students to the innovation and idea generation process and helps students determine the most desirable educational path for them to achieve their career goals. Sophomore standing.

MGT 347 Franchising 3 cr
This course is designed for students who are interested in learning about the opportunities and threats that abound in the modern world of franchising. Students will study existing franchising from both a historical and theoretical context. The logic of this course is that franchising is one of the development models that minimize risk for the "small business" focused student. Some franchising oriented people may want to start a franchise and grow it rapidly. This option is often a first step into business ownership for inexperienced owners. We discuss the applicability, opportunities, challenges, and implementation of the franchising model for expanding existing businesses. The format consists of case study and lecture discussion sequenced with extensive background readings, occasional guest lecturers, and a term case-based project culminating in a transactional plan.

MGT 351 Human Resource Management 3 cr
Principles, policies, and practices used to develop a sound human resource management program in the business organization. Among the topics included are job analysis, employment, organization development, employee development and evaluation, wage and salary administration and labor relations.
Prerequisite: MGT 300 Minimum Grade of D or MGT 322 Minimum Grade of D.
MGT 355  Leg & Fin Aspects of Entrepren   3 cr
This course provides an overview of the legal and financial issues most frequently encountered by entrepreneurs and others involved in start-ups and small closely held, or family businesses. The course covers various aspects of financing and entrepreneurial venture. Major topics attracting seed and growth capital from sources such as venture capital, investment banking, government, and commercial banks; creating, protecting and leveraging intellectual property. Among the issues discussed are valuing a company, going public, selling out, acquisitions, bankruptcy, different legal forms or organizations, partnerships, and taxes.

MGT 356  Strategic Issues in Family Bus   3 cr
This course examines a new discipline that has developed in the last ten years and focuses on the unique aspects of family businesses. Organizational behavior, law, finance, operations, and basic small business concepts are being integrated into this course. Students will have an opportunity to consult with and develop transition plans for a family firm in a live field project.

MGT 357  Leadership   3 cr
This course includes a review of traditional as well as current thinking in Leadership theory. Students will complete several self-assessment exercises designed to assess one's leadership style and ability as a leader. A series of successful leaders will be studied in-depth. Prerequisite: Junior or senior standing.

MGT 390  Total Quality Management   3 cr
Total Quality Management (TQM) is a management philosophy which emphasizes customer focus, continuous improvement, and employee involvement throughout the organization. This course is an introductory course which examines these components and their integration into a comprehensive quality management system. Pre-requisite: (MGT 300 Minimum Grade of D or MGT 322 Minimum Grade of D) and (MGT 325 Minimum Grade of D or MGT 396 Minimum Grade of D or BMS 384 Minimum Grade of D).

MGT 441  Service Operations   3 cr
This course will provide students the opportunity to learn about service operations management, including service strategies and operations considerations and imperatives for service enterprises and how service systems are structured and operated. Students will also learn about various tools and techniques for managing service operations such as how to forecast service demand, determine capacity requirements, schedule activities, coordinate operations, plan and schedule service activities, and evaluate system performance. Pre-requisite: (MGT 325 Minimum Grade of D or BMS 384 Minimum Grade of D or MGT 396 Minimum Grade of D).

MGT 450  Organizational Staffing   3 cr
A detailed study of the function of employee staffing in a modern work organization. Emphasis on job analysis, criterion development, development and use of employment tests, validation of selection techniques, and statistical methods for making fair employment decisions. Course work includes a comprehensive staffing project. Pre-requisite: MGT 351 Minimum Grade of D and (BUS 245 Minimum Grade of D or ST 210 Minimum Grade of D).

MGT 451  Employee Training -Development   3 cr
An applied course which details the training and development function. Content areas of job analysis, training needs analysis, training program development and implementation, and program evaluation will be incorporated in a comprehensive training and development project. Pre-requisite: MGT 340 Minimum Grade of D and MGT 351 Minimum Grade of D.

MGT 452  Employment Law   3 cr
Analysis of significant workplace torts and laws regulating the employment relationship including: Title VII, FMLA, AOA, ADEA, FLSA, OSHA and related state laws. Emphasis on federal legislation and developing case law. Pre-requisite: MGT 351 Minimum Grade of D and (BUS 265 Minimum Grade of D or MGT 310 Minimum Grade of D or MGT 332 Minimum Grade of D or MGT 422 Minimum Grade of D or BMS 422 Minimum Grade of D).

MGT 454  Compensation Administration   3 cr
A study of the fundamentals of compensation administration in organizations. Topics include job analysis, KSA determination, job evaluation, wage structure development, incentive pay systems, legal aspects of compensation and new developments in compensation. Comprehensive course project required. Pre-requisite: MGT 351 Minimum Grade of D.

MGT 455  Labor - Management Relations   3 cr
An examination of the organizing, negotiation, and contract administration phases of union-management relations. Case analyses, federal legislation and case law in labor relations, significant current issues, and a collective bargaining simulation are featured. Pre-requisite: MGT 351 Minimum Grade of D.
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<tr>
<th>Course Code</th>
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<td>MGT 460</td>
<td>Organizational Development and Change</td>
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<td>MGT 462</td>
<td>Negotiation/Dispute Resolution in Business</td>
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<td>MGT 465</td>
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<td>MGT 483</td>
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<td>MGT 490</td>
<td>Special Topics</td>
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**MGT 460 Organizational Development and Change 3 cr**
Provides insight into the theory and practice of organization change and development. It bridges the gap between theory and practice and emphasizes the process of improving both organizations and individuals. Topics covered encompass understanding organizations and how they change, intervention strategies and methods for improving organizations, quality of work-life approaches and strategic considerations in system-wide change.
Pre-requisite: MGT 300 Minimum Grade of D or MGT 322 Minimum Grade of D.

**MGT 462 Negotiation/Dispute Resolution in Business 3 cr**
This course provides theoretical background and practical applications in business negotiation, conflict management, and alternative dispute resolution. Areas covered include positional and interest-based bargaining, business and employment arbitration, organizational conflict management strategies, mediation, and effective communications for negotiators and ADR participants.
Pre-requisite: (MGT 300 Minimum Grade of D or BMS 322 Minimum Grade of D or MGT 322 Minimum Grade of D).

**MGT 465 New Venture Creation 3 cr**
How new businesses are organized and planned. Objectives are 1) understanding the knowledge, skills and abilities required of entrepreneurs, 2) creating and developing opportunities for new ventures, and 3) planning resources to convert those opportunities into businesses. Students work in teams to develop a business plan for a new venture they have chosen.
Pre-requisite: MGT 345 Minimum Grade of C or MGT 355 Minimum Grade of C.

**MGT 470 High Performance Organizations 3 cr**
Course examines the role of organization culture, leadership, employee involvement, work teams, and human resource practices in developing and sustaining high performance organizations that practice the principles of total quality management. Senior Standing.
Pre-requisite: (MGT 300 Minimum Grade of D or MGT 322 Minimum Grade of D or BMS 322 Minimum Grade of D).

**MGT 475 Strategic Human Resource Management 3 cr**
This is a capstone course in human resource management that reviews essential human resource management topics to prepare students for the SHRM Assurance of Learning Exam. Topics covered include strategic HR, ethics, recruiting and selection, employee and organizational development, performance management, employment law, compensation administration, workplace safety, employee relations, labor relations, and general management topics including motivation, individual differences, organizational culture, and leadership. In addition, the course covers state of the art issues in human resource management, which are new and not well developed in existing texts.
Pre-requisite: MGT 351 Minimum Grade of D and (MGT 340 Minimum Grade of D or MGT 320 Minimum Grade of D).

**MGT 483 Social Entrepreneurship 3 cr**
The course provides a broad theoretical perspective and practical framework for understanding social entrepreneurs and the social ventures they create ranging from local social organizations to large international social ventures leading global change. The course introduces students to the possibilities of social entrepreneurship and an introduction to the entire social venture creation process and life cycle. This course is a service-learning based and all students will participate in term-based community-based projects with local non-profit organizations. Extensive work outside of the normal classroom hours is required for this course.

**MGT 485 Business Policy in Global Environment 3 cr**
The culmination course in business and management education. Interdisciplinary and global in nature, the course uses the case method to develop a top management perspective in which all business disciplines are integrated into the organization’s effective total functioning. Prerequisites: Seniors who have completed all core courses, have petitioned for graduation and are beginning the final semester.
Co-requisite: MGT 486
Pre-requisite: (BUS 305 Minimum Grade of D or MGT 350 Minimum Grade of D or BMS 412 Minimum Grade of D) and (FIN 315 Minimum Grade of D or BMS 341 Minimum Grade of D or FIN 341 Minimum Grade of D) and (MGT 305 Minimum Grade of D or MGT 324 Minimum Grade of D) and (MGT 310 Minimum Grade of D or BUS 265 Minimum Grade of D or MGT 332 Minimum Grade of D or MGT 422 Minimum Grade of D or BMS 422 Minimum Grade of D) and (BMS 325 Minimum Grade of D or MGT 396 Minimum Grade of D or BMS 384 Minimum Grade of D) and (BMS 320 Minimum Grade of D or BMS 371 Minimum Grade of D or MKT 371 Minimum Grade of D).

**MGT 486 Undergraduate Comprehensive Exam 0 cr**
Comprehensive exam
Co-requisite: MGT 485

**MGT 490 Special Topics 3 cr**
Designed to provide senior students an opportunity to study selected topics of particular interest. A student may count no more than six hours of Special Topics in the concentration. Prerequisite: Approval of Department Chair.
MGT 492 Management Analysis & Consult 3 cr
Designed to help students bridge the gap between management theory and the realities involved in the practice of management. Topics include (1) development of the human, social, and political skills of the student as an individual, (2) business ethics, (3) global management issues, and (4) current trends in society that affect business and management. Assignments include a project with a local organization to identify critical management issues, analyze alternatives, and present specific recommended solutions to company managers. Senior standing. Pre-requisite: (MGT 300 Minimum Grade of D or BMS 322 Minimum Grade of D or MGT 322 Minimum Grade of D) and (MGT 320 Minimum Grade of D or MGT 340 Minimum Grade of D) and MGT 351 Minimum Grade of D.

MGT 494 Dir St in Management 3 cr
Primarily designed to give superior students an opportunity to study some phase of management of particular interest. Conferences, a bibliography, and a formal research report are required. Junior or senior standing, a cumulative GPA of 2.5 or better, and approval of the department chair following the evaluation of a written proposal.

MGT 496 Management Internship 3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed projects under the supervision of a Department Chair. No more than three hours of internship credit may be counted toward a degree in the Mitchell College of Business. Prerequisites: Junior or Senior standing, declared major in management, overall GPA of at least 2.5, and Internship Agreement signed by department chair.

MGT 498 Management Internship II 3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed learning experiences under the supervision of a Department Chair. Requirements: Junior or senior standing, declared major in marketing, overall GPA of at least 2.5, and internship agreement signed by the Department Chair. Pre-requisite: MGT 496 Minimum Grade of P.

MGT 521 Data Analy for Bus Decisions 3 cr
An examination of basic statistical concepts used in business analysis. Topics include fundamental probability, sampling, statistical estimation, test of hypothesis, analysis of variance, and regression analysis. Emphasis is placed on the use of statistical techniques for business decision making.

MGT 522 Supply Chain & Operations Mgmt 3 cr
An integrative approach to the processes, operations, and information required to produce and transform resources into value-added outputs that maximize customer satisfaction. Particular emphasis is placed on strategic supply chain management, operations strategy, value chain analysis, demand management, process mapping, quality assurance, customer fulfillment strategies, order fulfillment processes, relationship and information management in supply networks, measuring operational performance, and analytical tools for managing operations and supply systems.

MGT 532 Legal & Ethical Environ of Bus 3 cr
Legal and Ethical Environment of Business is designed to develop an in-depth analytical understanding of selected legal/ethical issues and trends and their impact on management and other business functions. Students will analyze the legal and ethical implications of issues including products liability, professional regulations, corporate responsibility, workplace discrimination and harassment, privacy, workplace safety, restraints on trade, land use regulation, international law, and alternative dispute resolution.

MGT 590 Sp Top - 3 cr
Designed to provide graduate students an opportunity to study selected topics. Approval of Department Chair. A student may count no more than three hours if Special Topics in the MBA degree program. Prerequisites: MBA Prerequisites P

MGT 594 Independent Study - Management 3 cr
Readings and research on selected topics. Conferences and formal research report required. Prerequisites: Approval of Department Chair.

MGT 599 MBA Comprehensive Exam 0 cr
A corequisite course with MGT 580 with no credit hours which includes a graduate comprehensive business exam.

MGT 601 Sem in Org Behavior 3 cr
This seminar provides an introduction to established theories and emerging trends in the field of organizational behavior. The course explores the thoughts, emotions, and behaviors of individuals within the context of work, teams, organizations, and society. The emphasis is on organizational theory and development.

MGT 603 Seminar in Org Theory & Change 3 cr
This is a foundational overview seminar. The purposes of the seminar are to 1) provide an in-depth understanding of the dominant theoretical approaches used in organizational theory, 2) give a historical overview of the theories of organization change, and 3) develop student skills in evaluating, extending, and communicating ideas about organizational theory and/or change as it relates to the student's research.
MGT 605  Leadership  3 cr
This course includes a review of traditional as well as current thinking in leadership theory with a special emphasis on emotional and social intelligence and organizational citizenship behavior.

MGT 607  Strategic Management  3 cr
The course is designed to develop a thorough understanding of the primary frameworks of competitive strategy and corporate strategy. Topics covered in the course include: industry and competitive analysis, resource-based view of the firm, value chain analysis, competitive strategies, business models, scope of the firm, strategic alliances, and offensive and defensive strategies.

MGT 609  Sem. Sp. Topics  3 cr
This course will cover two broad areas. The first is a reprise and extension of Structural Equation Modeling (SEM). The second is an introduction to Game Theory (GT) and applications thereof.

MGT 799  Dissertation Research  1 TO 6 cr
Independent Scholarship working with committee. Pre-requisite: MGT 798 Minimum Grade of P.

Marine Sciences (MAS)

MAS 134L  Ocean Science Laboratory  1 cr
Laboratory experiences associated with BLY 134. Co-requisite: MAS 134

MAS 134  Ocean Science  3 cr
An introduction to physical, chemical, geological and biological oceanography. Equivalent to BLY 134. Co-requisite: MAS 134L

MAS 331  Marine Science I  3 cr
This course will present the basic principles of geological and physical oceanography. Marine science is an interdisciplinary science field in which geology, physics, chemistry and biology interact in complex ways that are fundamental to the oceanic environment. This course will examine the characteristics of oceanic and coastal geomorphology and the associated marine sediments as well as the circulation of water masses that reside in these different regions of the world’s oceans. Geological oceanography topics that will be covered include: Structure and evolution of ocean basins, types and properties of marine sediments, sediment transport processes and characterizing coastal regions. Physical oceanography topics that will be covered include: basic physical laws, properties of the water and the ocean, air-sea interactions, general circulation and coastal processes.

MAS 332  Marine Science II  3 cr
Oceanography (”ocean”= the marine environment, and “graphy”= the study of) is literally the study of the marine environment. In practice, oceanography is an interdisciplinary science at the intersection of geology, chemistry, physics and biology. Marine Science II focuses on fundamental concepts in chemical and biological oceanography. The study of chemical oceanography will encompass dissolved components, stratification, chemical tracers, marine pollution, ocean acidification and global warming. This will lead to an introduction to biological oceanography, which will include organismal biology, marine adaptation and fisheries. In-class lectures will provide the students with the foundation to understand the principles discussed and will be supplemented with discussion of the modern ways in which these disciplines are pursued.

MAS 367  Marine Biology  4 cr
Local marine environments and the classification, morphology, and ecology of the locally occurring flora and fauna. (usually taught in the summer semester) Equivalent to BLY 367. Pre-requisite: ( (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) ) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C) and (CH 115 Minimum Grade of D or CH 131 Minimum Grade of D) and (CH 116 Minimum Grade of D or CH 132 Minimum Grade of D).

MAS 371  Shark and Ray Biology  2 cr
This course will provide an introduction to biology of sharks and rays, with special emphasis on regional shark fauna and field techniques. Topics to be covered include chondrichthyan origin, systematics, sensory biology, trophic ecology, reproductive biology, life history, ecology, fisheries and conservation. Lectures will be supplemented with discussions of papers from the primary literature to familiarize students with current research. In addition, longline, trawl and gillnet sampling will provide students with firsthand knowledge of field techniques and local shark identification. Equivalent to BLY 371. Pre-requisite: ( (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C) ).
MAS 430  Marine Botany  4 cr
A general survey of marine algae and vascular and non-
vascular plants associated with the marine environment. Distribution, identification, structure, ecology, and reproduction will be considered. Course offered only through Marine Environmental Science Consortium, (usually taught in the summer semester). Equivalent to BLY 430.
Pre-requisite: (BLY 121 Minimum Grade of D or BLY 141 Minimum Grade of D) and (BLY 122 Minimum Grade of D or BLY 142 Minimum Grade of D) and (CH 115 Minimum Grade of D or CH 131 Minimum Grade of D) and (CH 116 Minimum Grade of D or CH 132 Minimum Grade of D).

MAS 451  Marine Vertebrate Zoology  4 cr
A study of marine vertebrates, with emphasis on fishes, their systematics, zoogeography, and ecology, (usually taught in the summer semester). Equivalent to BLY 451.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (CH 115 Minimum Grade of C and CH 116 Minimum Grade of C).

MAS 471  Marine Invertebrate Zoology  4 cr
A study of natural history, systematics, and morphology of marine invertebrates, (usually taught in the summer semester). Equivalent to BLY 471.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

MAS 474  Intro to Oceanography  4 cr
A general introduction to the oceans, with emphasis on chemical, physical, and geological processes and their relation to biological systems. Course offered only through Marine Environmental Science Consortium (DISL). Offered during the summer term.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

MAS 475  Marine Ecology  4 cr
The relationship of marine organisms to their environment, (usually taught in the summer semester). Equivalent to BLY 475.
Pre-requisite: (BLY 121 Minimum Grade of C or BLY 141 Minimum Grade of C) and (BLY 122 Minimum Grade of C or BLY 142 Minimum Grade of C) and (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C).

MAS 490  Special Topics  1 TO 4 cr
An in-depth tutorial exposure to specific areas in the marine sciences. Credit and title will be arranged to examine the subject matter in the area of current interest to one group of students. Specialized topics not currently listed in catalog course offerings.

MAS 510  Oceanography and Marine Bio  3 cr
Oceanography is an interdisciplinary science at the intersection of geology, chemistry, physics and biology. This course is designed to be a survey course of these four disciplines with special emphasis on the biological aspects of ocean sciences. In-class lectures will provide the students with the foundation to understand the principles discussed, and will be supplemented with discussion of the modern ways in which these disciplines are pursued.

MAS 511  Marine Analytical Methods  3 cr
This course will provide an introduction to the analytical methods most commonly used in marine science: spectrometry, fluorometry, colorimetry, gas and liquid chromatography and the use of radio-isotopes. The course will consist of lectures covering the theory of each method and laboratory exercises in their use. Throughout, there will be a focus on the quality of the data being collected, as derived from quantitative assessments of accuracy, precision and repeatability; and propagation of errors. Students will be assessed on problem-sets based on data collected in the labs and on a research project using the instruments and techniques of their choice.

MAS 512  Chlorophyll Fluorescence Tech  2 cr
This course will provide an introduction to the scope and application of fluorescence techniques based on excitation of and emission from the ubiquitous plant pigment chlorophyll a. These include fluorometric determination of chlorophyll concentration in vitro; the use of active, single-wavelength fluorometry to assess temporal and spatial variability of chlorophyll a and microalgal biomass in natural assemblages; the use of multiple-wavelength excitation and/or hyperspectral emission to determine taxonomic distributions in vivo; and the use of modulated (pulse-amplitude modulated and fast repetition rate) fluorometry to investigate photosynthetic efficiency and model productivity.
MAS 515 Environmental Toxicology 3 cr
Introduction to the scientific and technical principles of toxicological processes in the context of the ecosystem. Students will understand the types of major environmental toxicants and how to properly evaluate their toxicity and factors that influence toxicity. Students will recognize and coherently formulate risk assessment and by using the tools and techniques acquired, develop and communicate proposals for remediation.
Pre-requisite: (BLY 301 Minimum Grade of C or BLY 341 Minimum Grade of C) and (BLY 302 Minimum Grade of C or BLY 311 Minimum Grade of C) and (BLY 303 Minimum Grade of C or BLY 325 Minimum Grade of C) and (CH 201 Minimum Grade of C or CH 222 Minimum Grade of C).

MAS 520 Marine Resource Management 3 cr
Designed to acquaint graduate students concerned with management of marine resources; development of legislation, evolution of policy, legal processes, impacts on human resources. The emphases will be placed on living resources.

MAS 521 Marine Conservation Biology 3 cr
This course will develop student's understanding of conservation biology in marine habitats. Lectures and assigned or student-selected readings will cover the widest possible range of current topics in marine conservation biology. Regular field trips will supplement and exemplify lecture topics. Each class will include an introductory lecture that presents an overview of basic ecological concepts and historical perspective for the assigned readings, followed by discussion. Students will lead discussion of student selected papers and write a topical term paper.

MAS 522 Horseshoe Crabs- Resource Mgmt 2 cr
The course will travel to Delaware Bay, home of the largest population of horseshoe crabs in the world. Students will gain and apply information on recent conflicts in horseshoe crab research and fishery management to explore political, ecological, and economic values of marine resources, options for management, conservation, and outreach, conflict resolution and applied ecology.

MAS 523 Anthropogenic Impacts on Coast 3 cr
This course will offer a state-of-the-art review of the nature and extent of anthropogenic impacts on marine coastal ecosystems, including climate change, destruction of wetlands, overfishing and nutrient pollution.

MAS 524 Scientific Communication 3 cr
Instruction on the principles of scientific communication and opportunities to practice different forms of written and oral communication common to marine and other sciences. Topics include: 1) the rationale for scientists to communicate effectively, 2) how to identify and share information to different audiences, 3) successful scientific date presentations, 4) writing, editing, publishing, and reviewing abstracts, scientific papers, and proposals, and 5) biases in scientific communication.

MAS 525 Chemical Ecology 3 cr
Chemical Ecology focuses on chemically medicated interactions within organisms in both aquatic and terrestrial environments. The topics covered include: chemoreception, chemical defense, chemical attraction, and the impact of chemical ecology on humans.

MAS 530 Marine Microbial Ecology 3 cr
A general survey of the types of microorganisms found in the marine environment. Emphasis will be on the interaction of microorganisms with each other and with their environment. In particular, the role of microorganisms in carbon cycling and biogeochemical processes will be stressed. Readings from current literature will expose students to the latest techniques and research.

MAS 531 Physiol Eco Marine Microalgae 3 cr
This course will cover the aclimatic responses of marine microalgae to variability in light, nutrients, temperature and other environmental factors. Stress responses that are engendered when variability in these environmental factors exceeds the organisms' aclimative capacity will also be covered. The course will emphasize the commonality of these processes across taxa as well as considering taxon-specific responses that allow different groups to exploit their niches. Methods such as molecular biology, active fluorescence and remote sensing that can be used to investigate population dynamics and growth over a range of spatial and temporal scales will be covered.

MAS 532 Marine Trophic Processes 3 cr
This course will examine the nature and controls of the trophic routes followed by primary production and resulting carbon budgets in coastal ecosystems. Trophic processes in marine ecosystems such as herbivory, consumption by secondary consumers, decomposition, export/import and burial will be studied. The course will also offer a review of anthropogenic impacts, such as eutrophication and climate change, on the trophic rate of primary production and carbon budgets in coastal ecosystems. Students are expected to contribute with personal experimental projects and critical reading and discussion of seminal papers.

MAS 533 Marine Molecular Ecology 3 cr
The use of molecular biology in ecological studies has been increasing rapidly with the development of new techniques. These techniques can supplement the laboratory and field studies traditionally part of ecology. This course seeks to introduce the use of molecular techniques in marine ecology through lectures accompanied by computer exercises using data from public databases. Lectures will pull data from the primary literature, with emphasis on examples of applications in marine science. Computer exercises will introduce students to how data is analyzed as well as to some of the programs available to carry out this analysis.
MAS 540  Sediment Biogeochemistry  3 cr
Detailed examination of sediment biogeochemical processes and the implications thereof on nutrient cycles, plant production, and animal distribution, including discussion of early diagenesis in coastal sub-tidal and wetland sediment systems. Permission of instructor.

MAS 548  Marine Biogeochem Processes  2 cr
The course will examine the interaction between biological, chemical and geological processes in the marine environment. This will be done by first reviewing the cycling of several of the major elements (e.g. carbon, nitrogen, phosphorus, sulfur, and iron) in the sea, and then examining how these cycles differ between various marine ecosystems (e.g. open ocean surface waters, estuaries, coral reefs, seagrass systems and tidal marshes). The focus will be on developing an understanding of how biogeochemical processes serve to regulate ecosystem function in these various habitats. Prerequisites: Organic chemistry, geology, marine ecology.

MAS 550  Fisheries Techniques  3 cr
Students are exposed to a detailed, semi-quantitative introduction to current biological and technological methodologies for studying fishes and aquatic habitats, with emphasis on study design and integration across sub-disciplines.

MAS 551  Quant Methods Fish and Ecology  3 cr
Ecological and fisheries research has progressed beyond qualitative inference and is continuing to adopt more quantitative methods. A diversity of modeling and experimental approaches exists for ecologists and fisheries scientists. This course is designed to familiarize the students with the most commonly used quantitative approaches. Requires permission of instructor.

MAS 555  Fisheries Oceanography  2 cr
Students examine the relationships between fish life history, recruitment dynamics and harvest potential, and local-, meso- and global scale oceanographic processes. Students are exposed to the evolution in thinking on the role of interaction between biology and physics relative to fish and fisheries.

MAS 560  Mar Exp Ecol  4 cr
Advances in marine ecology and oceanography are dependent on the ability of researchers to design effective and robust experiments to test hypothesis. Understanding the power, limitations and potential biological and statistical artifacts are critical to achieving this goal. The course focuses on fundamental concepts in the design and analysis of experiments in marine sciences, ecology and fisheries. Primary emphasis will be placed on design and interpretation and secondarily on techniques for analyses. Various analysis of variance models will be introduced beginning with completely randomized designs and factorial treatment structures, and proceeding through block and split-plot designs. In-class demonstrations and take-home problems will provide students with experience in performing many of these analyses.
Pre-requisite: BLY 520 Minimum Grade of C or ST 540 Minimum Grade of C and ST 545 Minimum Grade of C. ST 545 can be taken concurrently with this course.

MAS 570  Ocean Var and Global Change  2 cr
This course will examine large scale, spatial and temporal variability in the Earth/ocean system as evidenced by present-day and paleo records. Variability such as the El Nino Southern Oscillation will be covered. It will critically evaluate the evidence for and the consequences of modern global change as it pertains to the marine environment. Emphasis will be placed on potential changes in climate, biogeochemical cycles, hydrologic cycles, eutrophication/species diversity, and UV light fluxes. Prerequisites: Permission of instructor.

MAS 571  Marine Hydrodyn-Biomechanics  4 cr
To present an introduction to the importance of small scale fluid dynamics, thermodynamics, and solid mechanics to marine science and to present techniques for measurement of important parameters.

MAS 572  Estuarine Hydrodynamics  3 cr
This course will address physical processes in estuarine environments. With physical processes in estuaries occurring in various time scales, discussion will proceed in terms of three different time scales: turbulent, tidal, and residual time scales. Emphasis will be placed on mass transport by physical transport processes (water movement). Pre-requisite: MAS 601 Minimum Grade of B.

MAS 573  Oceanology of Gulf of Mexico  3 cr
This course provides a survey of the physics, chemistry, biology, geology and meteorology of the continental margins and deep ocean regions in the Gulf of Mexico and adjacent waters. Requires permission of instructor.

MAS 574  Marine Ecosystem Modelling  3 cr
An introduction to the principles, tools, and applications of marine ecosystem modelling. Emphasis will be placed on biological and physical coupling and numerical representations of these processes. Students will develop facility with numerical tools and learn how to apply coupled models to their ecosystems of interest.
MAS 575  Marine Ecology  4 cr
The course covers general ecological principles and how they apply to marine ecosystems. Both open ocean and nearshore waters are considered. Specific topics covered include: adaptations of marine organisms for life in the intertidal vs. subtitle zones; different modes of feeding and reproduction in marine organisms; and the importance of predation, competition, adult/larval interactions and dispersal mechanisms. The second half of the course is devoted to discussion of specific habitats including: coral reefs, mangrove swamps, kelp forests, and hydrothermal vents.

MAS 576  Benthic Ecology  2 cr
This course covers the evolutionary history and the ecology of marine benthic communities from the earliest fossils to present. The importance of scale and of proper design will considered. Other topics include: predation, competition, adult/larval interactions and dispersal mechanisms. There will be discussion of productivity and materials cycling in benthic systems. Special topics of students' suggestions conclude the course.

MAS 577  Coastal Processes  3 cr
The coastal ocean has a physical regime that is distinct from that of the open ocean. This physical regime contributes to disproportionately high levels of ecological productivity associated with these areas. Because of the often close coupling of physical and biogeochemical processes in the coastal ocean, the solutions to the problem facing these ecosystems typically require interdisciplinary perspectives. The objective of the course is to introduce the main physical processes and fisheries in the coastal ocean. The course will provide an overview of the physics operating in the coastal ocean and link the physical forcings to biogeochemical processes and ecosystem function. The course will cover topics from shelf break-open ocean interactions to the fundamental processes operation in estuarine environments. The end goal is for graduate students to acquire a fundamental understanding of the physical mechanisms driving the circulation and the associated hydrographic properties in the coastal ocean and how those physical phenomena link to biogeochemical processes.
Pre-requisite: MAS 601 Minimum Grade of C. MAS 601 can be taken concurrently with this course.

MAS 579  Coastal Ecosystem Dynamics  2 cr
Coastal Ecosystem Dynamics will allow students to investigate the basic principles of ecosystem structure and function. The course is divided into 2 parts: an instructional phase for learning basics of ecosystem modeling, and a student-led investigation of the structure and function of a variety of coastal ecosystems. This approach will give the student a set of quantitative tools for modeling ecosystems. Also, students will learn to evaluate differences and similarities of energy and nutrient processing in disparate ecosystems. There will be one 2 hr class meeting each week during which students will learn to use the ecological modeling software packages 'Ecopath' and 'Ecoism'. During the initial period, students will 'dissect' published models (obtained from the Internet) as a mechanism to understand the utility of ecosystem modeling as well as the basics of this particular software. The second half of the course will be devoted to student-constructed ecosystem models. The models will be constructed from data and pathway descriptions in Alongi's 'Coastal Ecosystem Processes' (CRC Press). A synthesis of these models will be constructed and placed on the WWW.

MAS 580  Marine Biogeo and Paleoecology  3 cr
This graduate level course will give students a broad overview of the time course of evolutionary changes in the structure and function of marine ecosystems, and will consider the interacting roles of both historical and current factors as they influence the distribution and abundance of marine organisms. Lectures will be mixed with discussions of assigned readings from the primary literature to stimulate critical thinking about the various topics.

MAS 581  Advanced Marine Ecology  2 cr
This course will build on the foundations provided by introductory ecology courses to enhance understanding of the mechanisms that control the distribution and abundance of marine plants and animals. The class periods will be dominated by discussions of assigned readings from the primary literature, which will be complemented by summary lecture material.

MAS 582  Marine Larval Ecology  2 cr
An in depth treatment of the taxonomy, nutrition, dispersal, bio-energetics, behavior, and bio-physical coupling of larval forms of marine species.

MAS 583  Field Marine Science I  2 cr
The Field Marine Science course will consist of an 11 day field exercise in representative coastal sites in Maine with emphasis on rocky intertidal, kelp bed and eelgrass habitats. Two faculty members will accompany the students, participate in the pre-trip readings and evaluate the product developed by each student.
MAS 584 Oceanographic Experience 1 TO 3 cr
This course provides students with practical skills involved in oceanographic research. Skills may include hydrographic, hydroacoustic, and organismic sampling, gear deployment and use of analytical instrumentation at sea. Students participate in one or more oceanographic cruises during a semester and carry out a defined project using research tools available on the ship. A final report on the project forms the major part of the course grade. Crises are available only on an ad hoc basis so permission of the instructor is required.

MAS 585 Marine Zooplankton 3 cr
This course familiarizes the student with the taxonomic breadth of estuarine and marine zooplankton ranging from protists through all major phyla of metazoa. Though the focus of the course is on taxonomic familiarization, basic biology (including reproduction and feeding) of all major taxa represented in the plankton will be covered. Students will also learn basic and advanced field collection, laboratory and statistical techniques. Although not a prerequisite, it is useful for students to have a background in invertebrate zoology.

MAS 586 Marine Restoration Ecology 3 cr
The course examines factors in the evolution current U.S. and International marine and coastal policy related to the management of natural resources. Course includes policy components, policy information implementation, change processes and economic criteria for evaluating policy effectiveness. The course also surveys the basic approaches to economic valuation of marine resources.

MAS 587 Seagrass Ecosystem Ecology 2 cr
A survey of current literature on topics related to the ecology of seagrass ecosystems. Students will read assigned papers to be analyzed in faculty lead discussion format. A final research paper will be prepared by each student.

MAS 588 Field Marine Science II 3 cr
The Field Marine Science course will consist of an 8-12 day field exercise in representative coastal sites.Faculty members with diverse interests will accompany the students, participate in pre-trip discussions and evaluate the product developed by each student. The course is designed to familiarize students with habitats and research conditions on the Northern Gulf Coast. Field trip locations are selected on the basis of faculty and student interest, economics, and availability of logistic support. Students pay their room and board costs for the field exercise. The course is primarily for graduate students, but advanced undergraduates may enroll with consent of instructor. Both MAS 588 and MAS 583 may be taken for credit when each is taught in a different environment.

MAS 589 Marine Plankton 3 cr
The course familiarizes the student with the taxonomic breadth of phytoplankton, bacterioplankton and zooplankton in estuaries, coastal seas and open oceans. Though the focus of the course is on taxonomic familiarization, basic biology (including reproduction and feeding) of all major taxa represented in the plankton will be covered. Student will learn fundamental, as well as "cutting-edge", field laboratory and statistical techniques. Two hours of lectures each week will be accompanied by two hours of hand-on laboratory work. Prerequisites: Graduate status in one of the physical or biological sciences.

MAS 590 Sp Top - 1 TO 4 cr
An in-depth tutorial exposure to specific areas in the marine sciences. Credit and title will be arranged to examine the subject matter in an area of current interest to one or group of students. Specialized topics not currently listed in catalog course offerings. MAS 590 is available to master students - MAS 690 is available to Ph.D. students.

MAS 592 Seminar 1 cr
Students and faculty meet weekly in an interactive discussion of current literature in marine sciences. The focus will be on "state-of-the-art" theories and methodologies as they occur in the primary marine literature. Student presentation is required to receive credit.

MAS 594 Directed Studies 1 TO 4 cr
Independent research, not related to the thesis, under the direction of a member of the graduate faculty. May be used to learn new techniques or explore research questions of special interest. A maximum of 4 hours may be earned for this course toward the MS degree.

MAS 599 Thesis 1 TO 8 cr
Independent research by the student under the sponsorship of a member of the department. Progress reports of the work accomplished are required every six months.

MAS 601 Physical Oceanography 4 cr
Physical properties and circulation of the worlds oceans. Topics to be covered include: basic physical laws; properties of heat, water, and salt budgets; waves; tides; large and small scale circulations; sea-level fluctuations; interactions of the sea with the atmosphere and land masses; light and acoustics.

MAS 602 Chemical Oceanography 4 cr
An in-depth examination of the chemistry of sea water and its relationship with biological, geological, and physical processes in the oceans. Coverage of sea water composition, buffering capacity, redox potential, and photochemistry will form the basis for an in-depth analysis of dynamic equilibria of gases, organic materials, nutrients, and trace elements in the sea. Critical evaluation of recent primary literature in chemical oceanography will be used to illustrate state-of-the art research approaches.
MAS 603  Geological Oceanography  4 cr
Geological Oceanography encompasses the historic and current consequences of both geophysical and classical geological processes. Included topics are tectonic theory and its development, sedimentary processes in coastal and oceanic provinces, stratigraphy, structural geology, micropaleontology, erosion, diagenesis and the formation of hydrocarbons.

MAS 604  Biological Oceanography  4 cr
A comprehensive survey of marine organisms and their interaction including pelagic and benthic communities of the oceans, coastal waters and estuaries. Primary formation of particulate material, feeding processes, kinetics of food webs, biogeochemical processes, patterns of distribution, ecology of biotic systems, human interactions and current concerns are topics to be covered.

MAS 690  Sp Top -  1 TO 4 cr
An in-depth tutorial exposure to specific areas in the marine sciences. Credit and title will be arranged to examine the matter in an area of current interest to one or group of students. Specialized topics not currently listed in catalog course offerings. MAS 690 is available to master students - MAS 690 is available to Ph.D. students.

MAS 692  Seminar  1 cr
Students and faculty meet weekly in an interactive discussion of current literature in marine sciences. The focus will be on "state-of-the-art" theories and methodologies as they occur in the primary marine literature. Student presentation is required to receive credit.

MAS 694  Directed Studies  1 TO 4 cr
Independent research, not related to the dissertation, under the direction of a member of the graduate faculty. May be used to learn new techniques or explore research questions of special interest. A maximum of 4 hours may be earned for this course toward a Ph.D. degree.

MAS 799  Dissertation  1 TO 8 cr
Independent research by the student under the sponsorship of a member of the department.

Marketing (MKT)

MKT 310  Intro International Business  3 cr
This course focuses on exploring the terminology, scope, status and evolving patterns of international business. Specifically, the course addresses the role of cultural, political, ethical, technological, and economic factors in the international business context and how businesses deal with uncertainty and risk. The course examines the impact of global forces on businesses at home and abroad, the role of governments in promoting and protecting business interests, the role of international agencies in the business environment.

MKT 320  Principles of Marketing  3 cr
Study of the institutions involved in creating transactions necessary to satisfy the needs of households, businesses and government and international customers. Topics include marketing planning, market segmentation, societal and ethical obligations, strategies for product, promotion and channel decisions.

MKT 336  International Marketing  3 cr
Examination of cultural, economic, and political factors that affect marketing of goods and services worldwide. Emphasis is placed on developing global marketing strategies of multinational corporations within existing trade structure and regulations. Both product and service flows between countries and regions are discussed.
Pre-requisite: (MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D).

MKT 340  Marketing Analytics  3 cr
Contemporary marketers acquire large amounts of data. Marketing Analytics explains a) the most common marketing metrics, and b) how to compute and interpret these metrics to improve decision making.
Pre-requisite: MKT 320 Minimum Grade of D and BUS 245 Minimum Grade of D.

MKT 350  Digital Marketing  3 cr
Examination of the interactive processes and transactions involved in satisfying the needs of consumers, businesses, and government. Involves the study of marketing planning, consumer research, segmentation, and implementation of marketing strategies.
Pre-requisite: (MKT 320 Minimum Grade of D or BMS 371 Minimum Grade of D or MKT 371 Minimum Grade of D).

MKT 355  Customer Relationship Mgt  3 cr
The course provides a comprehensive business model integrating customers and suppliers along the value chain. The focus is on the methodologies, tools, and techniques required for customer acquisition, retention, and profitability in competitive buyer/supplier environments.
Pre-requisite: MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D.

MKT 374  Consumer Behavior  3 cr
Study of the contributions of the behavioral sciences to the interpretation of market information. Involves the use of behavioral information which pertain to the analysis of consumers and organizational buyers in both domestic and international settings.
Pre-requisite: MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D.
MKT 375  Supply Chain Management  3 cr
This course encompasses the design and management of the supply-chain system that collectively provides for the exchange of title, physical movement, and storage activities in marketing, including the use of new technologies. This course examines the role of manufacturers and intermediaries in channel strategies including scope, methods, problems, and opportunities of total supply chain coordination.
Pre-requisite: MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D.

MKT 376  Business to Business Marketing  3 cr
Study of the participants, channels, and relationships that govern the behavior of industrial buyers and marketers.
Pre-requisite: MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D.

MKT 377  Pricing Strategies  3 cr
Pricing strategies encompass the design and monitoring of an integrative framework for making pricing decisions. The purpose of this course is to synthesize economic and behavioral principles with marketing, accounting, and financial information, and to analyze the various pricing options within legal, market, and corporate constraints.
This course covers both theory and application of pricing strategies for national and multinational concerns organized as either a profit or non-profit entity.
Pre-requisite: (MKT 320 Minimum Grade of D or BMS 371 Minimum Grade of D or MKT 371 Minimum Grade of D).

MKT 379  Retailing  3 cr
Study of the management of retail operations. Topics include store location and layout, merchandise buying and planning, legal and ethical issues, promotion, pricing, human resource management, financial planning, information systems and customer services.
Pre-requisite: MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D.

MKT 380  Integrated Mkt Communications  3 cr
Study of the fundamentals of marketing communications from a strategic perspective. Examines the roles of and relationships between a variety of marketing communication elements including advertising, direct marketing, database marketing, interactive marketing, media planning, public relations, sales promotion, and personal selling.
Pre-requisite: (MKT 320 Minimum Grade of D or BMS 371 Minimum Grade of D or MKT 371 Minimum Grade of D).

MKT 381  Sales Mgt & Personal Selling  3 cr
Study of the principles and practices of sales management in planning, organizing, directing, and controlling, the sales organization in both domestic and international markets. Included in the course are skills developed through presentation, discussion, and role playing. Special emphasis is directed to recruiting, selecting, training, evaluating, compensating, and supervising sales personnel and sales organizations.
Pre-requisite: MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D.

MKT 382  Brand Management  3 cr
Systematic examination of strategies involved in tangible and intangible product decisions. Issues and strategies involved in identifying and implementing the development of new goods and services for both domestic and international markets are examined in-depth, as well as the management of mature products.
Pre-requisite: (MKT 320 Minimum Grade of D or BMS 371 Minimum Grade of D or MKT 371 Minimum Grade of D).

MKT 384  Market Research  3 cr
Study of information gathering techniques, research methods and procedures used to solve marketing problems in consumer and organizational in both domestic and international markets.
Pre-requisite: (BUS 255 Minimum Grade of D or ST 275 Minimum Grade of D or BMS 250 Minimum Grade of D or BMS 255 Minimum Grade of D or BMS 300 Minimum Grade of D) and (MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D).

MKT 385  Services Marketing  3 cr
Study of the unique features of services marketing and the service sector. Examines the strategies and activities of organizations and industries whose core product is service, such as sports, hospitality, healthcare, financial services, information technology, and event marketing.
Pre-requisite: (MKT 320 Minimum Grade of D or BMS 371 Minimum Grade of D or MKT 371 Minimum Grade of D).

MKT 405  Curr Issues in Sup Chain Mgt  3 cr
An integrative course highlighting the major managerial challenges in key components of the supply chain, including sourcing, production, and logistics, with special emphasis on supply chain integration, customer value and performance measurement.
Pre-requisite: MKT 375 Minimum Grade of D.

MKT 477  Export-Import Management  3 cr
Study of exporting and importing strategies used by both domestic and multinational firms including a concentration in the areas of international pricing, governmental assistance, and channel selection. Emphasis is placed on the best practices and procedures of packing and documentation.
Pre-requisite: (MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D) and (MKT 336 Minimum Grade of D or MKT 383 Minimum Grade of D) and (MKT 336 Minimum Grade of D or MKT 383 Minimum Grade of D).

MKT 479  Marketing Policy - W  3 cr
The capstone course for marketing majors. Integration and application of marketing concepts requiring analysis of both domestic and international marketing problems.
Pre-requisite: (MKT 320 Minimum Grade of D or MKT 371 Minimum Grade of D or BMS 371 Minimum Grade of D) and (MKT 374 Minimum Grade of D and (MKT 373 Minimum Grade of D or MKT 384 Minimum Grade of D or MKT 474 Minimum Grade of D).
MKT 490  Special Topics  3 cr
Designed to provide senior students an opportunity to study selected topics of particular interest. A student may count no more than six hours of Special Topics in the concentration. Prerequisite: Approval of Department Chair. Pre-requisite: MKT 320 Minimum Grade of D.

MKT 492  Applications in Intl Business  3 cr
This course may take several formats to allow students who have achieved senior status the best method of applying concepts learned in other courses to the international business environment. The formats include a case-based course, a lecture-based course, an experiential course or mixture of those and other alternatives. Pre-requisite: MKT 320 Minimum Grade of D and MKT 310 Minimum Grade of D.

MKT 494  Directed Study in Marketing  1 TO 3 cr
Primarily designed to give superior students an opportunity to study selected topics of particular interest. Conferences, a bibliography, and a formal research report are required. Grades are awarded on a satisfactory/unsatisfactory basis. Prerequisites: Junior or senior standing, a cumulative GPA of 2.5 or better, and approval of the department chair following the evaluation of a written proposal.

MKT 496  Marketing Internship  3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed projects under the supervision of Department Chair. No more than three hours of internship credit may be counted toward a degree in the Mitchell College of Business. Prerequisites: Junior or Senior standing, declared major in marketing, overall GPA of at least 2.5, and Internship Agreement signed by department chair.

MKT 497  Marketing Internship II  3 cr
The internship program is designed to give students practical experience in their field of study. Students complete directed learning experiences under the supervision of the Department Chair. Prerequisites: Junior or Senior Standing, declared major in marketing, overall GPA of at least 2.5 and internship agreement signed by Department Chair. Pre-requisite: MKT 496 Minimum Grade of P.

MKT 499  Marketing Management  3 cr
This seminar examines the theory underpinning the study of Marketing. The seminar uses the classic research in Marketing to frame modern theoretical developments and provide students with a strong fundamental platform for their future studies.

MKT 501  Analysis using Info Sys  3 cr
Advanced management requires the ability datasets, interpret data with datasets and calculate statistics from data. This course covers all the process of building, interpreting, calculating data and finally making decisions on the outcomes of that process. A significant part of the grade in this course comes from decision making exercises.

MBA 501  Managing Accounting Info  3 cr
This course focuses on making decisions using Accounting information which includes how to generate relevant and appropriate data and how to use accounting analysis to enhance success in making decisions. Pre-requisite: ACC 211 Minimum Grade of C.

MBA 502  Managing in the Bus. Env’t  3 cr
The course evaluates managerial decisions in a business environment impacted by ethical considerations, sustainability, social responsibility and stakeholder interests. The course also focuses on developing student skills in communication. Pre-requisite: ECO 215 Minimum Grade of C.
MBA 504  Customers & Supply Chains 3 cr
This MBA course focuses on the role of customers and vendors on organizations. The course uses projects and decision scenarios to address the issues that result from managing supply chains and customer relationships.

MBA 505  Managing People 3 cr
This MBA course emphasizes the role of people within an organization and the issues and the decisions related to managing human assets. The course develops a number of techniques and scenarios that emphasize the importance of effective human resource management.
Pre-requisite: MGT 300 Minimum Grade of C.

MBA 506  Managing Finance and Capital 3 cr
Business managers must have a strong grasp of the role of finance and capital in the organization. The course focuses on establishing a strong knowledge base and the key decisions needed to be a successful manager.
Pre-requisite: FIN 315 Minimum Grade of C.

MBA 507  Managing Strategic Decisions 3 cr
The MBA Capstone course emphasizes decision making in a strategic context and builds upon all the courses taken prior to and concurrently with the course. The course includes decisions at the strategy development and strategy execution level. The evaluation exercises include an assessment of ethical, socially, responsible, and sustainability issues.
Co-requisite: MGT 599

MBA 590  Special Topics 3 cr
The MBA Program includes courses that are designed to allow students the opportunity to learn management skills and applications through non-traditional formats. This course is designed to achieve that objective. Subject to the approval of the Director of Graduate studies.

Maternal Child Nursing (MCN)

MCN 347  NuChild-Bearing/Child Rearing 4 cr
Analysis of theories, concepts, evidence, and issues and trends in professional nursing care of the childbearing and childrearing family. Emphasis on the use of the nursing process and other systematic approaches to plan, implement, and evaluate health promotion and maintenance activities, illness care, and rehabilitation with individuals and families in various stages of childbearing and childrearing, as well as the gynecological care of women in a variety of acute and community settings.
Co-requisite: MCN 348
Pre-requisite: CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C and (NU 211 Minimum Grade of C or NU 300 Minimum Grade of C) and (NU 221 Minimum Grade of C or NU 301 Minimum Grade of C). CMN 350 and CMN 351 can be taken concurrently with this course.

MCN 348  Childbearing/Childrearing Clin 4 cr
The purpose of this course is to provide students the opportunity to engage in clinical practice with childbearing and childrearing families as well as the gynecologic care of women. Emphasis is on the role of the professional nurse in the application of concepts and theories related to health promotion and maintenance, illness care and rehabilitation with childbearing and childrearing families.
Co-requisite: MCN 347
Pre-requisite: CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C and (NU 211 Minimum Grade of C or NU 300 Minimum Grade of C) and (NU 221 Minimum Grade of C or NU 301 Minimum Grade of C). CMN 350 and CMN 351 can be taken concurrently with this course.

MCN 535  Ped Acute Care Nsg Intensive 1 cr
The purpose of this course is to provide opportunity for the Pediatric Acute Care Nurse Practitioner student to gain experience in a pediatric acute setting prior to entering pediatric acute specialty specific courses.

MCN 536  Ped Primary Care Nsg Intensive 1 cr
The purpose of this course is to provide opportunity for the Pediatric Primary Care Nurse Practitioner student to gain experience in a pediatric primary setting prior to entering pediatric primary specialty specific courses.

MCN 537  Women's Health Nsg Intensive 1 cr
The purpose of this course is to provide opportunity for the Women's Health Nurse Practitioner student to gain experience in a women's health setting prior to entering women's health specialty specific courses.

MCN 538  Intro to Women's Health NP 3 cr
The purpose of this course is to expand the Women's Health Nurse Practitioner student's knowledge and skills for obtaining, recording and analyzing a systematic health assessment of women. Emphasis is on the synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management.
Co-requisite: MCN 541
Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.

MCN 540  Women's Hlth NP Cl Progression 1 TO 4 cr
The purpose of this progression practicum is to facilitate student independence in the Women's Health Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Women's Health Nurse Practitioner role.
MCN 541  **HPDP Women's Health NP  2 cr**
The purpose of this didactic course is to prepare the Women's Nurse Practitioner student to identify and implement appropriate health promotion and disease prevention strategies across the lifespan. The focus is on the advanced practice nursing of individuals and families in primary care settings. Emphasis is placed on health promotion/disease prevention with strategic planning at the primary, secondary and tertiary levels of prevention. Various issues are explored pertinent to the advanced practice role.
Co-requisite: MCN 538

MCN 542  **Women's Health NP I  3 cr**
The purpose of this didactic course is to prepare the Women's Health Nurse Practitioner student to assess, diagnose, and manage selected health care needs of women. The focus is on advanced practice nursing with women primary, acute, and chronic health care settings. Emphasis is on wellness and the pathophysiology and epidemiology underlying acute and chronic health problems.
Co-requisite: MCN 543
Pre-requisite: MCN 538 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.

MCN 543  **Women's Health NP Pract I  3 cr**
The purpose of this practicum course is to provide opportunities for the Women's Health Nurse Practitioner student to apply concepts from MCN 542 Advanced Women's Health Nursing II in select clinical settings. Focus is on advanced practice nursing with women and families in primary, acute, and chronic health care settings. The emphasis is on diagnostic reasoning and decision making/critical thinking.
Co-requisite: MCN 542

MCN 544  **Women's Health NP II  3 cr**
The purpose of this course is to provide the Women's Health Nurse Practitioner student an in-depth study of the health care management of women within the framework of advanced nursing. The focus is on selected acute and chronic complex health care problems. Emphasis is on the interaction among health care providers in a culturally diverse environment.
Co-requisite: MCN 545
Pre-requisite: MCN 542 Minimum Grade of C.

MCN 545  **Women's Health NP Pract II  3 cr**
The purpose of this course is to provide opportunity for the Women's Health Nurse Practitioner student to practice within an advanced nursing framework. The focus is on the role of the advanced practice nurse in the health care management of women. Emphasis is on collaboration with other health care providers in a culturally diverse environment.
Co-requisite: MCN 544

MCN 546  **Women's Health NP Pract III  4 cr**
The purpose of this culminating course is to provide a preceptor and faculty facilitated experience in the Women's Health Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses.
Co-requisite: MCN 547
Pre-requisite: MCN 544 Minimum Grade of C and NU 608 Minimum Grade of C and NU 607 Minimum Grade of C. NU 608 and NU 607 can be taken concurrently with this course.

MCN 547  **Women's Health NP III  3 cr**
The purpose of this course is to provide a forum for the evaluation of issues and trends encountered in advanced women's health nursing care. Emphasis is on critical analysis and management of issues by the Women's Health Nurse Practitioner student in an interdisciplinary health care system.
Co-requisite: MCN 546
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

MCN 548  **Intro to Ped Primary Care NP  3 cr**
The purpose of this course is to prepare Advanced Pediatric Primary Care Nurse Practitioner students to assess, diagnose, and manage selected health care needs of children. Emphasis is placed on synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management.
Co-requisite: MCN 551
Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.

MCN 551  **HPDP Pediatric Primary Care NP  2 cr**
The purpose of this didactic course is to prepare the Pediatric Primary Care Nurse Practitioner student to identify and implement appropriate health promotion and disease prevention strategies for children from birth to adolescence. The focus is on the advanced practice nursing of children and families in primary care settings. Emphasis is placed on health promotion/disease prevention with strategic planning at the primary, secondary, and tertiary levels of prevention. Various issues are explored pertinent to the advanced practice role.
Co-requisite: MCN 548
MCN 552  Pediatric Prim Care NP I  3 cr
The purpose of this didactic course is to prepare the Advanced Pediatric Primary Care Nurse Practitioner student to assess, diagnose, and manage selected health care needs of children from birth to school age. The focus is on advanced practice nursing with children and families in primary care settings. Emphasis is on the wellness, and the pathophysiology and epidemiology underlying acute and chronic health problems.
Co-requisite: MCN 553
Pre-requisite: MCN 548 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.

MCN 553  Ped Prim Care NP Prac I  3 cr
The purpose of this practicum course is to provide opportunities for the Advanced Pediatric Primary Care Nurse Practitioner student to apply concepts in select clinical settings. Focus is on advanced practice nursing with children and families in primary care settings. The emphasis is on diagnostic reasoning and decision making/critical thinking.
Co-requisite: MCN 552

MCN 554  Pediatric Primary Care NP II  3 cr
The purpose of this course is to provide the Advanced Pediatric Primary Care Nurse Practitioner student an in-depth study of the health care management of children from school age to adolescence within the framework of advanced nursing. The focus is on selected acute and chronic complex health problems. Emphasis is on the interaction among health care providers in a culturally diverse environment.
Co-requisite: MCN 553
Pre-requisite: MCN 552 Minimum Grade of C.

MCN 555  Ped Prim Care NP Prac II  3 cr
The purpose of this course is to provide opportunity for the Pediatric Primary Care Nurse Practitioner student to practice within an advanced nursing framework. The focus is on the role of the advanced practice nurse in the health care management of children. Emphasis is on collaboration with other health care providers in a culturally diverse environment.
Co-requisite: MCN 554

MCN 556  Ped Prim Care NP Prac III  4 cr
The purpose of this culminating course is to provide a preceptor and faculty facilitated experience in the Pediatric Primary Care Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses.
Co-requisite: MCN 557
Pre-requisite: MCN 554 Minimum Grade of C and NU 608 Minimum Grade of C and NU 607 Minimum Grade of C. NU 608 and NU 607 can be taken concurrently with this course.

MCN 557  Pediatric Primary Care NP III  3 cr
The purpose of this course is to provide a forum for the evaluation of issues and trends encountered in advanced pediatric primary care health nursing. Emphasis is on critical analysis and management of issues by the Advanced Pediatric Primary Care Nurse Practitioner in an interdisciplinary health care delivery system.
Co-requisite: MCN 556
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

MCN 558  Intro Pediatric Acute Care NP  3 cr
The course will introduce the Acute Pediatric Nurse Practitioner student to entry level NP decision making, evidenced based practice, documentation and resource optimization with an introductory emphasis on critical thinking skills in the development of appropriate history and examination, assessment, different diagnosis, as well as diagnostic and treatment plans for pediatric patients in primary and acute care settings, as they prepare to start clinical rotations.
Co-requisite: MCN 571
Pre-requisite: NU 518 Minimum Grade of C and NU 545 Minimum Grade of C. NU 518 and NU 545 can be taken concurrently with this course.

MCN 561  Peds Acute NP Clin Progression  1 TO  4 cr
This course provides an opportunity for the Acute Care Pediatric Nurse Practitioner student to apply more clinical time so as to master clinical concepts and improve competence before moving on to the subsequent term, or in their last clinical course before graduation.

MCN 562  Pediatric Acute Care NP I  3 cr
This course provides Acute Care Pediatric Nurse Practitioner students to assess, diagnose, and manage selected health care needs of children. The focus is on advanced practice nursing with children and families in acute care settings, evaluation diagnostic probability, evidenced based care and managing both inpatient and primary health care needs. Emphasis is placed on wellness, pathophysiology and epidemiology underlying acute and chronic health problems, as well as diagnostic reasoning, articulation of evidence based management plans, decision making, critical thinking and resource optimization.
Co-requisite: MCN 563
Pre-requisite: MCN 558 Minimum Grade of C and NU 578 Minimum Grade of C and MCN 571 Minimum Grade of C. NU 578 can be taken concurrently with this course.
MCN 563  Ped Acute Care NP Prac I  3 cr
This course provides an opportunity for the Acute Care Pediatric Nurse Practitioner student to apply concepts from Acute Care Pediatric Nurse Practitioner I course in select clinical inpatient and outpatient settings. The emphasis is on diagnostic reasoning, articulation of evidence based management plans, decision making, critical thinking and resource optimization. Practicum experiences will include primary care, inpatient hospitalist rotations, pediatric surgery rotations and urgent care rotations.
Co-requisite: MCN 562

MCN 564  Pediatric Acute Care NP II  3 cr
This course prepares Acute Care Pediatric Nurse Practitioner students to assess, diagnose, and manage selected health care needs of both acute and chronically ill children, focusing on technology dependent children, hematology, transplant, infectious disease as well as those with hematological, medical and surgical emergencies. Emphasis is on diagnostic reasoning, articulation of evidence based management plans, decision making, critical thinking and resource optimization.
Co-requisite: MCN 565
Pre-requisite: MCN 562 Minimum Grade of C and MCN 563 Minimum Grade of C.

MCN 565  Ped Acute Care NP Prac II  3 cr
This course provides an opportunity for the Acute Care Pediatric Nurse Practitioner student to apply concepts from Acute Care Pediatric Nurse Practitioner II in select clinical inpatient and outpatient settings. The emphasis is on diagnostic reasoning, articulation of evidence based management plans, decision making, critical thinking and resources optimization. Practicum experiences will include chronic subspecialty clinics and inpatient environments.
Co-requisite: MCN 564
Pre-requisite: MCN 562 Minimum Grade of C and MCN 563 Minimum Grade of C.

MCN 566  Ped Acute Care NP Pract III  4 cr
This course provides an opportunity for the Acute Care Pediatric Nurse Practitioner student to apply concepts from Acute Care Pediatric Nurse Practitioner III in select clinical inpatient and outpatient settings. The emphasis is on diagnostic reasoning, decision making/critical thinking and resource utilization. Practicum experiences will include emergency departments and critical care/intensive care units.
Co-requisite: MCN 567
Pre-requisite: MCN 564 Minimum Grade of C and MCN 565 Minimum Grade of C or NU 607 Minimum Grade of C or NU 608 Minimum Grade of C or NU 610 Minimum Grade of C or NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

MCN 567  Pediatric Acute Care NP III  3 cr
This course prepares the Acute Care Pediatric Nurse Practitioner student to appropriately assess, diagnose and manage selected acute, emergent, unstable and life threatening pediatric health care conditions, focusing on psychosocial emergencies, trauma, shock, burns, organ failure, toxicology/ingestions, environmental exposures, neurological presentations, as well as those requiring life support and end of life/palliative care, as the student prepares to graduate and assume a professional ACPNP role. The focus is on application and synthesis of knowledge and skills acquired in all previous courses.
Co-requisite: MCN 566
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and MCN 564 Minimum Grade of C and MCN 565 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

MCN 568  Intro to Neonatal NP  3 cr
The purpose of this first didactic course is to prepare Advanced Neonatal Nurse Practitioner students to assess, diagnose, and manage selected health care needs of neonates. Emphasis is placed on synthesis and application of nursing and related theories and scientific knowledge to the development of differential/nursing diagnoses as a basis for health promotion and management.
Co-requisite: MCN 571
Pre-requisite: NU 545 Minimum Grade of C and NU 518 Minimum Grade of C. NU 545 and NU 518 can be taken concurrently with this course.

MCN 571  HPDP NNP/Peds Acute NP  2 cr
The purpose of this didactic course is to prepare the Neonatal and Acute Care Pediatric Nurse Practitioner students to identify and implement appropriate health promotion and disease prevention strategies for the neonate to age 21 years. The focus is on the advanced practice nursing of individuals and families in primary care settings. Emphasis is placed on health promotion/disease prevention with strategic planning at the primary, secondary and tertiary levels of prevention. Various issues are explored pertinent to the advanced practice role.
Co-requisite: MCN 568
Pre-requisite: MCN 558 Minimum Grade of C or MCN 568 Minimum Grade of C.

MCN 572  Neonatal NP I  3 cr
The purpose of this didactic course is to prepare the Advanced Neonatal Nurse Practitioner student to assess, diagnose, and manage selected health care needs of neonates. The focus is on neonates and families in primary, acute, and chronic health care settings. Emphasis is placed on wellness and the pathophysiology and epidemiology underlying acute and chronic health problems.
Co-requisite: MCN 573
Pre-requisite: MCN 568 Minimum Grade of C and NU 578 Minimum Grade of C. NU 578 can be taken concurrently with this course.
MCN 573  Neonatal NP Pract I  3 cr
The purpose of this practicum course is to provide opportunities for the Advanced Neonatal Nurse Practitioner student to apply concepts in select clinical settings. Focus is on advanced nursing practice with neonates and their families in primary, acute, and chronic care settings. The emphasis is on diagnostic reasoning and decision making/critical thinking.
Co-requisite: MCN 572

MCN 574  Neonatal NP II  3 cr
The purpose of this course is to provide the Advanced Neonatal Nurse Practitioner student an in-depth study of the neonate within the framework of nursing. The focus is on selected acute and chronic complex health problems of neonates in the primary, acute, and chronic care settings. Emphasis is on the interaction among health care providers in a culturally diverse environment.
Co-requisite: MCN 575
Pre-requisite: MCN 572 Minimum Grade of C.

MCN 575  Neonatal NP Pract II  3 cr
The purpose of this course is to provide opportunity for the Advanced Neonatal Nurse Practitioner student to practice within an advanced nursing framework. The focus is on the role of the advanced practice nurse in the management of the neonate. Emphasis is on collaboration with other health care providers in a culturally diverse environment.
Co-requisite: MCN 574

MCN 576  Neonatal NP Pract III  4 cr
The purpose of this culminating course is to provide a preceptor-faculty facilitated experience in the Advanced Neonatal Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses.
Co-requisite: MCN 577
Pre-requisite: MCN 574 Minimum Grade of C and NU 607 Minimum Grade of C and NU 608 Minimum Grade of C. NU 607 and NU 608 can be taken concurrently with this course.

MCN 577  Neonatal NP III  3 cr
The purpose of this course is to provide a forum of the evaluation of issues and trends encountered in advanced neonatal nursing care. Emphasis is on critical analysis and management of issues by the Advanced Neonatal Nurse Practitioner in an interdisciplinary health care system.
Co-requisite: MCN 576
Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 608 and NU 610 and NU 613 can be taken concurrently with this course.

MCN 578  Neonatal NP Clin Progression  1 TO 4 cr
The purpose of this culminating course is to provide a preceptor-faculty supervised experience in the Neonatal Nurse Practitioner role with a focus on the application and synthesis of knowledge and skills acquired in all previous courses.

MCN 581  Peds Primary NP CI Progression  1 TO 4 cr
The purpose of this progression practicum is to facilitate student independence in the Pediatric Primary Care Nurse Practitioner role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Pediatric Primary Care Nurse Practitioner role.

MCN 604  Pediatric Acute Care NP PP&D  3 cr
This course assists the Pediatric Acute Care Nurse Practitioner DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the Acute Care Pediatric Nurse Practitioner students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

MCN 617  Pediatric Acute Care NP Res I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the student will work with the primary faculty advisor to complete projects and advance their selected practice area. The student will have access to and authority for expanded scope of practice to master the DNP competencies. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, students must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required.
Pre-requisite: MCN 604 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

MCN 618  Pediatric Acute Care NP Res II  3 cr
Provides students the opportunity to fully express all DNP competencies. The student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: MCN 617 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.
MCN 626  WHNP CNS Residency I  3 cr  
This course assists the women's health clinical nurse specialist DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the women's health clinical nurse specialist students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. The course will assist the DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the women's health clinical nurse specialist students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. The course will assist the DNP student to learn the processes embedded in developing a doctoral synthesis project.

Pre-requisite: MCN 625 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

MCN 627  WHNP CNS Residency II  3 cr  
Provides women's health clinical nurse specialist students the opportunity to fully express all DNP competencies. The women's health clinical nurse specialist student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.

Pre-requisite: MCN 626 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

MCN 628  WHNP CNS Residency III  3 cr  
Final course in residency series as women's health clinical nurse specialist student continues to implement and evaluate project plan. Provides the women's health clinical nurse specialist student the opportunity to fully express all DNP competencies. The women's health clinical nurse specialist student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.

Pre-requisite: MCN 627 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

MCN 636  Pediatric CNS Residency II  3 cr  
Provides pediatric clinical nurse specialist students the opportunity to fully express all DNP competencies. The pediatric clinical nurse specialist student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.

Pre-requisite: MCN 638 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

MCN 637  Pediatric CNS Residency I  3 cr  
This course assists the pediatric clinical nurse specialist DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the pediatric clinical nurse specialist students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. The course will assist the DNP student to learn the processes embedded in developing a doctoral synthesis project.

Pre-requisite: MCN 637 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C. NU 611 can be taken concurrently with this course.

MCN 638  Pediatric CNS Residency III  3 cr  
Final course in residency series as student continues to implement and evaluate project plan. Provides the pediatric clinical nurse specialist student the opportunity to fully express all DNP competencies. The pediatric clinical nurse specialist student, guided by the core faculty and advisor, completes quality improvement evidence-based system's change project.

Pre-requisite: MCN 637 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

MCN 646  Pediatric CNS Residency III  3 cr  
This course assists the pediatric clinical nurse specialist DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the pediatric clinical nurse specialist students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. The course will assist the DNP student to learn the processes embedded in developing a doctoral synthesis project.

Pre-requisite: MCN 645 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C. NU 611 can be taken concurrently with this course.
MCN 640  Women's Health NP Residency I  3 cr
This course assists the women's health nurse practitioner DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the women's health nurse practitioner student's selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

MCN 644  Women's Health NP PP&D  3 cr
Provides women's health nurse practitioner students the opportunity to fully express all DNP competencies. The women's health nurse practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project. Pre-requisite: MCN 645 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

MCN 646  Women's Health NP Residency II  3 cr
Provides women's health nurse practitioner students the opportunity to fully express all DNP competencies. The women's health nurse practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project. Pre-requisite: MCN 645 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

MCN 647  Women's Health NP Res III  3 cr
Final course in residency series as women's health nurse practitioner student continues to implement and evaluate project plan. Provides women's health nurse practitioner student the opportunity to fully express all DNP competencies. The women's health nurse practitioner student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project. Pre-requisite: MCN 646 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

MCN 654  Pediatric Primary Care NP PP&D  3 cr
This course assists the pediatric primary care nurse practitioner DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the pediatric primary care nurse practitioner student's selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

MCN 655  Pediatric Primary Care NP Res  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The pediatric primary care nurse practitioner student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the pediatric primary care nurse practitioner student will work with the primary faculty advisor to complete projects and advance their selected practice area. The pediatric primary care nurse practitioner student will have access to and authority for expanded scope of practice to master the DNP competences. Residency sites will depend upon the pediatric primary care nurse practitioner student’s career trajectory and approval by collaborating faculty. During the residency semester, the pediatric primary care nurse practitioner student must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required. Pre-requisite: MCN 654 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.
MCN 656  Ped Primary Care NP Res II  3 cr
Provides pediatric primary care nurse practitioner students the opportunity to fully express all DNP competencies. The pediatric primary care nurse practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: MCN 655 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

MCN 657  Ped Primary Care NP Res III  3 cr
Final course in residency series as the Pediatric Primary Care Nurse Practitioner student continues to implement and evaluate project plan. Provides the Pediatric Primary Care Nurse Practitioner student the opportunity to fully express all DNP competencies. The Pediatric Primary Care Nurse Practitioner student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: MCN 656 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

MCN 674  Neonatal NP PP&D  3 cr
This course assists the neonatal nurse practitioner DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the neonatal nurse practitioner students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

MCN 675  NNP Residency I  3 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The neonatal nurse practitioner student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the neonatal nurse practitioner student will work with the primary faculty advisor to complete projects and advance their selected practice area. The neonatal nurse practitioner student will have access to and authority for expanded scope of practice to master the DNP competencies. Residency sites will depend upon the neonatal nurse practitioner student's career trajectory and approval by collaborating faculty. During the residency semester, the neonatal nurse practitioner student must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required.
Pre-requisite: MCN 674 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

MCN 676  NNP Residency II  3 cr
Provides neonatal nurse practitioner students the opportunity to fully express all DNP competencies. The neonatal nurse practitioner student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: MCN 675 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

MCN 677  NNP Residency III  3 cr
Final course in residency series as neonatal nurse practitioner student continues to implement and evaluate project plan. Provides neonatal nurse practitioner student the opportunity to fully express all DNP competencies. The neonatal nurse practitioner student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: MCN 676 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

MCN 692  MCN DNP Project Progression  3 cr
Students will register for this course to complete residency course work under supervision of faculty. Students must remain continuously enrolled until all residency requirements are completed.
Pre-requisite: MCN 618 Minimum Grade of C or MCN 627 Minimum Grade of C or MCN 639 Minimum Grade of C or MCN 646 Minimum Grade of C or MCN 656 Minimum Grade of C or MCN 676 Minimum Grade of C.

Mathematics (MA)

MA 105  Algebra for Math Placement  4 cr
Introduction to equations of straight lines in various forms and transition between these forms; Manipulation and solution of linear equations and linear inequalities; graphing solution sets on the number line and expression of solution sets in both set and interval notation. Simplification, multiplication, and division of polynomials; Factoring quadratic expressions and the solution of quadratic equations by factoring; Solution of basic rational equations; Addition, subtraction, multiplication and division of rational expressions; simplification of complicated ratios of rational expressions. Working with set operations: Absolute value inequalities and equations and compound inequalities; Addition, subtraction, multiplication, division, and simplification of expressions with radicals and/or rational exponents and rationalization of numerator or denominator. Credit for both MTH 100, MTH 101 and MA 105 is not allowed.
MA 110 Finite Mathematics 3 cr
This course is intended to give an overview of topics in finite mathematics together with their applications. The course includes logic, sets, counting, permutations, combinations, basic probability, descriptive statistics and their applications. Students are required to have a scientific calculator. Core Course. Note: May be offered for Honors credit. NOTE: MA 110 is not a Pre-requisite for nor is it intended to be preparatory for any course listed below except MA 201 and MA 202.

MA 112 Precalculus Algebra 3 cr
The course covers algebraic, graphical and numerical properties of functions, focusing on linear, quadratic, general polynomial, absolute value, rational, exponential, and logarithmic functions. Topics also include equations, inequalities, and complex numbers. Applications of mathematics to modeling real world situations are emphasized. Credit for both MA 112 and MA 115 not allowed. Core Course. Pre-requisite: ACT Math 24 or MyMathTest 080 or MA 112 Minimum Grade of C or SAT Mathematics 560 or MATH SECTION SCORE 580 or TRNFR Math Placement 2.

MA 113 Precalculus Trigonometry 3 cr
Continuation of MA 112. Topics include numerical, graphical and algebraic properties of trigonometric functions, inverse trigonometric functions, right angle trigonometry, parametric equations, polar coordinates, and conic sections. Development and application of mathematical models to real-world situations is emphasized. Credit for both MA 113 and MA 115 not allowed. Core Course. Pre-requisite: ACT Math 24 or MyMathTest 080 or MA 112 Minimum Grade of C or SAT Mathematics 590 or MATH SECTION SCORE 610.

MA 115 Precal Algebra-Trigonometry 4 cr
This fast-paced course is designed as a review of the algebra and trigonometry needed in calculus. It covers the material of MA 112 and MA 113 in one semester. Topics include numerical, graphical and algebraic properties of polynomial, rational, exponential, logarithmic, and trigonometric functions; inverse trigonometric functions; right angle trigonometry; parametric equations; polar coordinates and conic sections. Applications of mathematics to modeling real-world situations are emphasized. Credit for both MA 112 and MA 115 not allowed; credit for both MA 113 and MA 115 not allowed. Core Course. Pre-requisite: ACT Math 25 or MyMathTest 080 or SAT Mathematics 620 or MATH SECTION SCORE 640.

MA 120 Calculus and Its Applications 3 cr
Introduction to calculus with an emphasis on problem solving and applications. Key concepts are presented graphically, numerically and algebraically, although the stress is on a clear understanding of graphs and tabular data. The course covers: algebraic, exponential and logarithmic functions, their properties and their use in modeling; the concepts of derivative and definite integral and applications. Students are encouraged to have a graphing calculator. Credit for both MA 120 and MA 125 not allowed. Students must have sufficient Mathematics Placement Exam score. MA 120 is not a prerequisite for subsequent calculus courses. Core Course. Pre-requisite: ACT Math 23 or MyMathTest 080 or MA 112 Minimum Grade of C or MA 113 Minimum Grade of C or MA 115 Minimum Grade of C or SAT Mathematics 575 or MATH SECTION SCORE 595.

MA 125 Calculus I 4 cr
The course provides an introduction to calculus with emphasis on differential calculus. Topics include limits of functions, derivatives of algebraic and transcendental functions, application of the derivative to curve sketching, optimization problems, and examples in the natural sciences, engineering, and economics. The course concludes with an introduction to anti-derivatives, definite integrals, and the fundamental theorem of calculus. Credit for both MA 120 and MA 125 is not allowed. Prerequisite: Sufficient Mathematics Placement Exam score. Core Course. NOTE: MA 110, MA 112, MA 113, MA 115, MA 120, and MA 125 have strict Pre-requisites. To be able to enroll in these courses a student needs either to pass the Pre-requisite course with C or better or to have a sufficient Mathematics Placement Exam score. Pre-requisite: ACT Math 27 or MyMathTest 090 or MA 113 Minimum Grade of C or MA 115 Minimum Grade of C or SAT Mathematics 665 or MATH SECTION SCORE 695.

MA 126 Calculus II 4 cr
This course is a continuation of MA 125 with emphasis on integral calculus. Topics include techniques of integration; applications of the definite integral to geometry, natural sciences, engineering, and economics; improper integrals; infinite sequences and series; Taylor polynomials and Taylor series; parametric equations and polar coordinates. Core Course. Pre-requisite: MA 125 Minimum Grade of C.

MA 150 Contemporary Math-Stat Seminar 1 cr
This course gives an overview of modern mathematics and statistics from the point of view of the practitioners. The course is designed for majors in mathematics and statistics at all levels as well as those students who are considering mathematics or statistics as a major or minor area of study. Topics usually included are elements of geometry, algebra, analysis, methods of statistical inference, the role of the computer in the analytical sciences; these topics vary from semester to semester. This course cannot be taken for credit simultaneously with ST 150. NOTE: May be offered for Honors Credit.
MA 201  Math for Elem Teachers I  3 cr
An examination of some of the major ideas encountered in the teaching of elementary mathematics. Topics include introduction to problem solving, sets, relations, logic, numeration systems, elementary number theory, properties and operations for whole numbers, integers, rational numbers, and real numbers. NOTE: MA 201 does not fulfill graduation requirements for any curriculum other than College of Education and Professional Studies.
Pre-requisite: MA 110 Minimum Grade of C or MA 112 Minimum Grade of C or MA 113 Minimum Grade of C or MA 115 Minimum Grade of C or MA 120 Minimum Grade of C or MA 125 Minimum Grade of C or MA 126 Minimum Grade of C or MA 150 Minimum Grade of C.

MA 202  Math for Elem Teachers II  3 cr
Topics covered are those that a prospective elementary or middle school teacher should expect to encounter in the teaching of geometry in elementary or middle school. Topics include geometric shapes, measurement, triangle congruence and similarity, and coordinate geometry. NOTE: MA 202 does not fulfill graduation requirements for any curriculum other than College of Education and Professional Studies.
Pre-requisite: MA 110 Minimum Grade of C or MA 112 Minimum Grade of C or MA 113 Minimum Grade of C or MA 115 Minimum Grade of C or MA 120 Minimum Grade of C or MA 125 Minimum Grade of C or MA 126 Minimum Grade of C or MA 150 Minimum Grade of C.

MA 227  Calculus III  4 cr
Vectors; functions of several variables; partial derivatives; local linearity; directional derivatives; the gradient; differential of a function; the chain rule; higher order partial derivatives; optimization of functions of several variables; multiple integrals and their applications; parametric curves and surfaces; vector fields; line and surface integrals; vector calculus. Core Course.
Pre-requisite: MA 126 Minimum Grade of C.

MA 237  Linear Algebra I  3 cr
This course provides an introduction to linear algebra. Topics include systems of linear equations, matrices, Gaussian elimination, rank, linear independence, subspaces, basis, dimension, linear transformations, determinants, eigenvalues and eigenvectors, change of basis, diagonalization, the abstract concept of a vector space, and applications. Core Course.
Pre-requisite: MA 126 Minimum Grade of C.

MA 238  Differential Equations I  3 cr
This course provides an introduction to ordinary differential equations. Topics include first order differential equations, higher order linear differential equations, systems of first order linear differential equations. Laplace transforms, methods for approximating solutions to first order differential equations, applications. Students should have taken or be taking MA 227. Core Course.
Pre-requisite: MA 227 Minimum Grade of D. MA 227 can be taken concurrently with this course.

MA 267  Discrete Math Structures  3 cr
This course is an introduction to discrete mathematics for students majoring in computer-related areas. Students will be introduced to concepts and methods that are essential to theoretical computer science. A strong emphasis is placed on mathematical reasoning and proofs. Topics include sets, functions, induction, recursion, combinatorics and graphs. Students must have sufficient mathematics placement exam score.
Pre-requisite: ACT Math 23 or MyMathTest 080 or MA 113 Minimum Grade of C or MA 115 Minimum Grade of C.

MA 290  Special Topics -  1 TO 3 cr
Selected topics in elementary undergraduate mathematics. This course may be repeated for a maximum of six credits.

MA 303  Math for Elem Teachers III  3 cr
An exploration of problem solving strategies. Problems exemplifying the various problem solving strategies studied. Emphasis on the development of problem solving skills by exploring interesting problems which demand for their solution that the student select from a wide variety of possible strategies and use a wide variety of conceptual tools. NOTE: MA 303 does not fulfill graduation requirements for any curriculum other than elementary education.
Pre-requisite: MA 202 Minimum Grade of C.

MA 311  Intro to Number Theory  3 cr
An introduction to classical number theory with a balance between theory and computation. Topics include mathematical induction, divisibility properties, properties of prime numbers, the theory of congruences, number theoretic functions, continued fractions.
Pre-requisite: MA 126 Minimum Grade of C.

MA 316  Linear Algebra II  3 cr
A continuation of MA 237. Topics include inner product spaces, spectral theorem for symmetric operators, complex vector spaces, Jordan canonical form. Additional topics such as duality and Tensor products among others to be included at the discretion of the instructor.
Pre-requisite: MA 237 Minimum Grade of C.

MA 320  Foundations of Math - W  3 cr
A transition to higher mathematics with an emphasis on proof techniques. Topics include symbolic logic, elementary set theory, induction, relations, functions, and the structure of the number system. Mathematics and Statistics majors are encouraged to take MA 320 as soon as possible after completing MA 125.
Pre-requisite: MA 125 Minimum Grade of C and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).
MA 321  Elementary Geometry  3 cr
This course covers the major topics from the secondary school curriculum of plane and solid geometry from a modern viewpoint. Emphasis will be placed on axioms, undefined terms, definitions, theorems, and proofs. Topics include straightedge and compass constructions, Euclidean geometry, Euclidean space, congruence, isometry, reflection, rotation, translation, vectors, parallel postulate, similarity, Pythagorean theorem, coordinate geometry, non-Euclidean geometry, projective geometry, projective space, perspective, homogenous coordinates.
Pre-requisite: MA 320 Minimum Grade of C.

MA 332  Differential Equations II  3 cr
Pre-requisite: MA 227 Minimum Grade of C and MA 238 Minimum Grade of C.

MA 334  Advanced Calculus I  3 cr
This is the first of a two course sequence designed to provide students with the theoretical context of concepts encountered in MA 125 through MA 227. Topics covered include Completeness Axiom, sequences of real numbers, suprema and infima, Cauchy sequences, open sets and accumulation points in Euclidean space, completeness of Euclidean space, series of real numbers and vectors, compactness, Heine-Borel Theorem, connectedness, continuity, Extremum Theorem, Intermediate Value Theorem, differentiation of functions of one variable.
Pre-requisite: MA 227 Minimum Grade of C and MA 320 Minimum Grade of C.

MA 335  Advanced Calculus II  3 cr
This is the second of a two course sequence designed to provide students with the theoretical context of concepts encountered in MA 125 through MA 227. Topics covered include integration of functions of one variable, pointwise and uniform convergence, integration and differentiation of series, differentiable mappings of several variables, chain rule, product rule and gradients, Mean Value Theorem, Taylor's Theorem, Inverse Function Theorem, Implicit Function Theorem.
Pre-requisite: MA 334 Minimum Grade of C.

MA 334 Minimum Grade of C.

MA 334 Advanced Calculus I  3 cr
This is the first of a two course sequence designed to provide students with the theoretical context of concepts encountered in MA 125 through MA 227. Topics covered include Completeness Axiom, sequences of real numbers, suprema and infima, Cauchy sequences, open sets and accumulation points in Euclidean space, completeness of Euclidean space, series of real numbers and vectors, compactness, Heine-Borel Theorem, connectedness, continuity, Extremum Theorem, Intermediate Value Theorem, differentiation of functions of one variable.
Pre-requisite: MA 227 Minimum Grade of C and MA 320 Minimum Grade of C.

MA 335  Advanced Calculus II  3 cr
This is the second of a two course sequence designed to provide students with the theoretical context of concepts encountered in MA 125 through MA 227. Topics covered include integration of functions of one variable, pointwise and uniform convergence, integration and differentiation of series, differentiable mappings of several variables, chain rule, product rule and gradients, Mean Value Theorem, Taylor's Theorem, Inverse Function Theorem, Implicit Function Theorem.
Pre-requisite: MA 334 Minimum Grade of C.

MA 335 Advanced Calculus II  3 cr
This is the second of a two course sequence designed to provide students with the theoretical context of concepts encountered in MA 125 through MA 227. Topics covered include integration of functions of one variable, pointwise and uniform convergence, integration and differentiation of series, differentiable mappings of several variables, chain rule, product rule and gradients, Mean Value Theorem, Taylor's Theorem, Inverse Function Theorem, Implicit Function Theorem.
Pre-requisite: MA 334 Minimum Grade of C.

MA 354  Comp Assist Math Modeling - W  3 cr
This course is intended to provide the basic ideas regarding formulation, development, testing and reporting of mathematical models of various real world problems. Deterministic and stochastic models, optimization and simulations will be covered. Emphasis will be on careful mathematical formulations and the use of computer software, such as Microsoft Excel, Mathematica and Matlab. A term project will be an important component of this course. The course is taught in a laboratory setting with computers as lab equipment.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and MA 227 Minimum Grade of C and MA 238 Minimum Grade of C.

MA 367  Combinatorial Enumeration  3 cr
An introduction to the mathematical theory of counting. Basic counting principles, permutations and combinations, partitions, recurrence relations, and a selection of more advanced topics such as generating functions, combinatorial designs, Ramsey theory, or group actions and Poyla theory.
Pre-requisite: MA 126 Minimum Grade of C.

MA 390  Special Topics  1 TO 3 cr
Selected topics in advanced undergraduate mathematics. This course may be repeated for a maximum of six credits.

MA 410  History of Mathematics - W  3 cr
Historical survey of the general development of mathematics with a balance of historical perspective and mathematical structure.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and MA 320 Minimum Grade of C.

MA 413  Abstract Algebra I - W  3 cr
An introduction to group theory and ring theory. Topics include permutations and symmetries, subgroups, quotient groups, homomorphisms, as well as examples of rings, integral domains, and fields.
Pre-requisite: MA 237 Minimum Grade of C and (MA 311 Minimum Grade of C or MA 320 Minimum Grade of C or MA 334 Minimum Grade of C) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MA 414  Abstract Algebra II - W  3 cr
A continuation of MA 413 focusing on rings and fields. Topics include rings, ideals, integral domains, fields and extension fields. Geometric constructions and Galois theory are introduced.
Pre-requisite: MA 413 Minimum Grade of C and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MA 434  Topology  3 cr
An introduction to topology with emphasis on the geometric aspects of the subject. Topics covered include surfaces, topological spaces, open and closed sets, continuity, compactness, connectedness, product spaces, and identification and quotient spaces. Credit for both MA 434 and MA 542 is not allowed.
Pre-requisite: MA 227 Minimum Grade of C and MA 237 Minimum Grade of C and MA 320 Minimum Grade of C.
MA 436 Numerical Analysis  3 cr
Topics include methods of numerical solution of nonlinear equations in one variable, fixed points, contraction mapping and functional iteration methods, interpolation and approximation methods, numerical differentiation and integration, numerical solution of ordinary differential equations, analysis of error for various numerical procedures. Implementation of Mathematica of all numerical methods discussed in class is an essential part of the course. Pre-requisite: MA 227 Minimum Grade of C and MA 238 Minimum Grade of C. MA 238 can be taken concurrently with this course.

MA 437 Complex Variables  3 cr
Arithmetic of complex numbers; regions in the complex plane, limits, continuity and derivatives of complex functions; elementary complex functions; mapping by elementary functions; contour integration, power series, Taylor series, Laurent series, calculus or residues; conformal representation; applications. Credit for both MA 437 and MA 537 not allowed. Pre-requisite: MA 238 Minimum Grade of C.

MA 451 Probability  3 cr
A comprehensive introduction to probability, the mathematical theory used to model uncertainty, covering the axioms of probability, random variables, expectation, classical discrete and continuous families of probability models, the law of large numbers and the central limit theorem. Credit for both MA 451 and MA 550 is not allowed. Pre-requisite: MA 227 Minimum Grade of C and MA 237 Minimum Grade of C.

MA 452 Financial Mathematics  3 cr
Introduction to financial mathematics and a brief introduction to financial economics. Students will learn about the time value of money, annuities, loans, bonds, general cash flows and portfolios, immunization, general derivatives, options, forwards and futures, swaps and hedging from the point of view of an actuarial scientist. Pre-requisite: MA 126 Minimum Grade of C.

MA 458 Operations Research - W  3 cr
An introduction to linear programming. The course will include a study of the simplex method as well as using computers to solve linear systems of equations. As time permits, topics covered will include sensitivity analysis, duality, integer programming, transportation, assignment, transshipment, and networks. Credit for both MA 458 and MA 567 is not allowed. Pre-requisite: (MA 215 Minimum Grade of C or MA 237 Minimum Grade of C) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MA 467 Mathematical Logic  3 cr
An introduction to formal first-order logic, first-order metatheory, and its extensions. Topics include axiom systems and their models, completeness, compactness, and recursive sets and functions. Identical with PHL 467. Credit cannot be received for both PHL 467 and MA 467. Pre-requisite: PHL 321 Minimum Grade of C or MA 311 Minimum Grade of C or MA 316 Minimum Grade of C or MA 318 Minimum Grade of C or MA 320 Minimum Grade of C or MA 321 Minimum Grade of C or MA 332 Minimum Grade of C or MA 334 Minimum Grade of C or MA 335 Minimum Grade of C or MA 354 Minimum Grade of C or MA 367 Minimum Grade of C or MA 410 Minimum Grade of C or MA 413 Minimum Grade of C or MA 414 Minimum Grade of C or MA 434 Minimum Grade of C or MA 436 Minimum Grade of C or MA 437 Minimum Grade of C or MA 451 Minimum Grade of C or MA 458 Minimum Grade of C or MA 490 Minimum Grade of C or MA 537 Minimum Grade of C or MA 542 Minimum Grade of C or MA 550 Minimum Grade of C.

MA 481 Cryptography  3 cr
This course provides an introduction to classical and modern methods of message encryption and decryption (cryptography) as well as possible attacks to cryptosystems (cryptanalysis). Topics include classical (symmetric) cryptosystems (DES, AES), public-key (asymmetric) cryptosystems (Diffie-Hellman, RSA, ElGamal), modes of operation, one-way and trapdoor functions, Hash functions, cryptographic protocols. Credit for both MA 481 and MA 581 is not allowed. Pre-requisite: MA 311 Minimum Grade of C.

MA 490 Special Topics  1 TO 3 cr
Selected topics in advanced undergraduate mathematics. This course may be repeated for a maximum of six credits.

MA 494 Directed Studies  1 TO 3 cr
Directed individual study. Requires permission of department chair.

MA 499 Honors Senior Project - H  3 TO 6 cr
With the guidance and advice of a faculty mentor, honors students will identify, and carry out a research project in Mathematics. The outcome of the research project will include a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three members of the faculty, chaired by the faculty mentor.

MA 501 Number Systems  3 cr
A case study of axiom systems and the deductive method for graduate students in Mathematics Education. It is expected that students in this course will practice and improve their logical skills, better understand proof as a mathematical activity, and study the similarities and differences between several commonly used number systems. Pre-requisite: MA 321 Minimum Grade of C or MA 413 Minimum Grade of C.
MA 502  Intro to Abstract Algebra  3 cr
An introduction to the fundamental concepts of modern algebra such as groups, rings, and fields through concrete examples. This course is designed for graduate students in the College of Education and Professional Studies. Pre-requisite: MA 413 Minimum Grade of C.

MA 503  Introduction to Analysis  3 cr
A careful look at the elements, procedures, and applications of differential and integral calculus. This course is designed for graduate students in the College of Education and Professional Studies. Pre-requisite: MA 227 Minimum Grade of C.

MA 504  Introduction to Geometry  3 cr
An introduction to the foundations of geometry using both synthetic and metric approaches. Euclidean, finite, projective, and hyperbolic geometries are discussed. The axioms for various geometries are discussed. The course is designed for graduate students in the College of Education and Professional Studies. Pre-requisite: MA 321 Minimum Grade of C.

MA 505  Mathematical Problem Solving  3 cr
An in-depth activity-based approach to the methods and strategies for mathematical problem solving for students in Mathematical Education. Problems selected from logic, algebra, analysis, geometry, combinatorics, number theory and probability. This course is designed for graduate students in the College of Education and Professional Studies. Pre-requisite: MA 321 Minimum Grade of C.

MA 506  Statistics for Teachers  3 cr
Prepares in-service and pre-service teachers to teach statistics in high schools using data-based approach. Uses hands-on-activities approach and simulation of situations to teach concepts and technology to teach data analysis. This course is designed for graduate students in the College of Education and Professional Studies. Pre-requisite: MA 126 Minimum Grade of C.

MA 507  Adv Ordinary Differential Eqns  3 cr
A graduate-level introduction to topics of ordinary differential equations and their applications in physics and engineering.

MA 508  Adv Partial Differential Eqns  3 cr
A continuation of MA 507 with more emphasis on theory of partial differential equations, as well as their applications in physics and engineering problems.

MA 511  Algebra I  3 cr
A graduate level introduction to group theory. Topics include quotient groups, homomorphisms, group actions, Sylow theorems, composition series, simple groups, free groups, fundamental theorem of abelian groups.

MA 512  Algebra II  3 cr
A graduate level introduction to ring theory and fields. Topics include ring homomorphisms, quotient rings, ideals, rings of fractions, Euclidean domains, principal ideal domains, unique factorization domains, modules, finite fields, field extensions. Pre-requisite: MA 511 Minimum Grade of C.

MA 515  Number Theory  3 cr
Modular arithmetic, arithmetic functions; prime numbers; algebraic number theory.

MA 516  Topics in Number Theory  3 cr
A second course in number theory, covering topics of interest to the students and instructor. Pre-requisite: MA 515 Minimum Grade of C.

MA 518  Linear Algebra I  3 cr
Fields, vector spaces, dual spaces, quotient spaces, multilinear forms, linear transformations, algebras, adjoints, eigenvalues.

MA 519  Linear Algebra II  3 cr
Triangular form, nilpotence, Jordan form, inner products, self-adjoint transformations, positive transformations, isometries, Spectral Theorem, polar decomposition, applications to analysis. Pre-requisite: MA 518 Minimum Grade of C.

MA 521  Enumerative Combinatorics  3 cr
Pigeonhole principle, basic counting techniques, binomial coefficients, inclusion-exclusion principle, recurrence relations, generating functions, systems of distinct representatives, finite fields.

MA 525  Graph Theory  3 cr
Fundamental concepts, connectedness, graph coloring, planarity and Kuratowski's theorem, four-color theorem, chromatic polynomial, Eulerian and Hamiltonian graphs, matching theory, network flows, NP-complete graph problems, Markov chains, matroids.

MA 535  Real Analysis I  3 cr
An introduction to real analysis. Topics include: the metric topology of the reals, limits and continuity, differentiation, Riemann-Stieltjes integral. Prerequisite: Undergraduate course in advanced calculus.

MA 536  Real Analysis II  3 cr
A continuation of MA 535. Topics covered include sequences and series of functions, differentiation and integration in several variables, an introduction to to the Lebesgue integral and differential forms as time allows. Pre-requisite: MA 535 Minimum Grade of C.
MA 537  Complex Analysis  3 cr  
Arithmetic of complex numbers; regions in the complex plane; limits, continuity and derivatives of complex functions; elementary complex functions; mappings by elementary functions; contour integration; power series; Taylor series; Laurent series; calculus of residues; conformal representation; applications. Credit for both MA 537 and MA 437 is not allowed.  
Pre-requisite: MA 238 Minimum Grade of C or MA 338 Minimum Grade of C.

MA 538  Topics in Complex Analysis  3 cr  
A second course in complex analysis, covering topics of interest to the students and instructor.  
Pre-requisite: MA 537 Minimum Grade of C.

MA 539  Measure Theory  3 cr  
Foundations of the general theory of measure and integration with particular attention to the Lebesgue integral. Function spaces, product measure and Fubini's theorem, the Radon-Nikodym theorem and applications to probability theory are discussed, and possibly additional topics such as Haar measure or the Ergodic Theorem.  
Pre-requisite: MA 536 Minimum Grade of C.

MA 540  Differential Geometry  3 cr  
Local and global theory of curves and surfaces in three-dimensional space.

MA 542  Topology I  3 cr  
An introduction to topology with emphasis on the geometric aspects of the subject. Topics covered include surfaces, topological spaces, open and closed sets, continuity, compactness, connectedness, product spaces, and identification and quotient spaces. Credit for both MA 542 and MA 434 is not allowed.

MA 543  Topology II  3 cr  
A continuation of MA 542. Topics covered include the fundamental group, triangulations, classification of surfaces, homology, the Euler-Poincare formula, the Borsuk-Ulam theorem, the Lefschetz fixed-point theorem, knot theory, covering spaces, and applications.  
Pre-requisite: MA 542 Minimum Grade of C or MA 434 Minimum Grade of C.

MA 550  Probability  3 cr  
A comprehensive introduction to probability, the mathematical theory used to model uncertainty, covering the axioms of probability, random variables, expectation, classical discrete and continuous families of probability models, the law of large numbers and the central limit theorem. Credit for both MA 550 and MA 451 is not allowed.  
Pre-requisite: (MA 227 Minimum Grade of C or MA 237 Minimum Grade of C).

MA 551  Theory of Statistics  3 cr  
A comprehensive introduction to the mathematical foundations of statistics. Sufficient statistics and information, parameter estimation, maximum likelihood and moment estimation, optimality properties of estimators and confidence intervals. Hypothesis testing, likelihood ratio tests and power functions. Credit for both MA 551 and ST 470 is not allowed.  
Pre-requisite: MA 451 Minimum Grade of C or MA 550 Minimum Grade of C.

MA 555  Statistical Analysis I  3 cr  
A first course in an integrated two course sequence in applied statistical theory and methods for research workers in technical fields. Coverage includes probability and basic probability models, mathematical expectations, random sampling processes and central limit theorem, estimation, hypothesis testing and power analysis, some applications of the theory of least squares. Computer assisted data analysis is used.

MA 560  Statistical Analysis II  3 cr  
A second course (continuation of MA 555) in an integrated two-course sequence in applied statistical theory and methods for research workers in technical fields. Coverage includes regression analysis, design and analysis of experiments, factorial experiments, analysis of covariance, nonparametric analytical techniques, analysis of count data. Computer assisted data analysis is used.  
Pre-requisite: MA 555 Minimum Grade of C.

MA 565  Numerical Analysis  3 cr  
An introduction to Numerical Analysis. Topics include error analysis, systems of linear equations, nonlinear equations, integration, ordinary differential equations among others.  
Pre-requisite: MA 535 Minimum Grade of C.

MA 566  Operations Research  3 cr  
An introduction to linear programming. The course will include a study of the simplex method as well as using computers to solve linear systems of equations. As time permits, topics covered will include sensitivity analysis, duality, integer programming, transportation, assignment, transshipment, and networks. Credit for both MA 567 and MA 458 is not allowed.  
Pre-requisite: (MA 215 Minimum Grade of C or MA 237 Minimum Grade of C).

MA 568  Topics in Operations Research  3 cr  
A second course in operations research, covering topics of interest to the students and instructor.  
Pre-requisite: MA 567 Minimum Grade of C.
MA 571  Ordinary Diff Equations  3 cr
An introduction to ordinary differential equations from a
dynamical systems perspective. Topics include existence
and uniqueness theorems, dependence on initial data, linear
systems and exponential of operators, stability of equilibria,
Poincare-Bendixon theorem. Additional topics such as
applications to population dynamics, classical mechanics,
periodic attractors among others will be included at the
discretion of the instructor.
Pre-requisite: MA 518 Minimum Grade of C.

MA 572  Partial Differential Equations  3 cr
An introduction to partial differential equations emphasizing
spectral methods. Topics include elementary Hilbert
spaces, Fourier series and integrals and their applications
to the study of the basic partial differential equations of
mathematical physics. More advanced topics such as
asymptotic properties and regularity of solutions and
nonlinear equations among others will be included at the
discretion of the instructor.
Pre-requisite: MA 536 Minimum Grade of C.

MA 581  Cryptography  3 cr
This course provides an introduction to classical and
modern methods of message encryption and decryption
(cryptography) as well as possible attacks to cryptosystems
(cryptanalysis). Topics include classical (symmetric)
cryptosystems (DES, AES), public-key (asymmetric)
cryptosystems (Diffie-Hellman, RSA, ElGamal), modes of
operation, one-way and trapdoor functions, Hash functions,
cryptographic protocols. Credit for both MA 481 and MA 581
is not allowed.
Pre-requisite: MA 311 Minimum Grade of C.

MA 590  Special Topics -  1 TO 3 cr
Selected topics in elementary graduate mathematics. This
course may be repeated for a maximum of six credits.

MA 592  Seminar  1 cr
Student Seminar. Topics covered vary. This course may be
repeated indefinitely, but only two credits count towards the
degree. Grading system: satisfactory/unsatisfactory.

MA 594  Directed Study  1 TO 3 cr
Directed individual study. Prerequisites: Approval of the
department chair.

MA 599  Thesis  1 TO 6 cr
Thesis. Requires approval of research prospectus by
Department Graduate Committee.

Mathematics For College
(MTH)

MTH 101  College Algebra  4 cr
This course combines Introductory Algebra and Intermediate
College Algebra. Topics include fractions, percents, and
order of operations. Various forms of linear equations
manipulated; the solutions and graphs of linear equations
and linear inequalities explored. Also included, rate of
change, functions and graphs, piecewise-defined functions,
solutions to absolute value inequalities expressed in set and
interval notation, and systems of inequalities. Simplification
of rational expressions, operations on rational and radical
expressions, and solutions to rational and radical equations
explored. Quadratic expressions factored and solutions to
quadratic equations by factoring and graphing. Practical
applications to problem solving are included. Pre-requisite:
None. Credit for both MTH 100, MTH 101 and MTH 105 is
not allowed.

Mechanical Engineering (ME)

ME 135  Engr Graphics and Comm  3 cr
Graphical representation of objects, orthographic, oblique,
and isometric views. Freehand lettering and sketching,
computer aided graphics, presentation of graphics based
on numerical data using spreadsheet, word processor and
presentation software. Fee.
Pre-requisite: MA 125 Minimum Grade of C. MA 125 can be
taken concurrently with this course.

ME 312  Mech Engr Thermodynamics  3 cr
Thermodynamics power and refrigeration cycles, gas
mixtures, psychometrics, and combustion. One-half hour of
design.
Pre-requisite: EG 270 Minimum Grade of D.

ME 314  Machine Component Design  3 cr
Analysis and design of machine elements to accomplish
given tasks within limits of stress and size. One hour of
design.
Pre-requisite: EG 284 Minimum Grade of D and EG 315
Minimum Grade of D.

ME 316  Instrumenttn & Exp Method  3 cr
Measuring system analysis and design, signal conditioning,
analysis of data, statistical error analysis, communication of
results.
Pre-requisite: EG 220 Minimum Grade of D and (MA 238
Minimum Grade of D or MA 338 Minimum Grade of D) and
(PH 202 Minimum Grade of C or PH 217 Minimum Grade of
C) and ME 328 Minimum Grade of D.
ME 317  Heat Transfer  3 cr
Steady and transient, multi-dimensional conduction, forced and natural convection, radiation, and heat exchangers. One-half hour of design.
Pre-requisite: EG 270 Minimum Grade of D and ME 328 Minimum Grade of D and (MA 238 Minimum Grade of D or MA 338 Minimum Grade of D) and (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D).

ME 319  Instrumentation & Exp Method Lab  1 cr
Laboratory component of ME 316 Instrumentation. The same grade will be given in both courses.
Co-requisite: ME 316
Pre-requisite: EG 220 Minimum Grade of D and (MA 238 Minimum Grade of D or MA 338 Minimum Grade of D) and (PH 202 Minimum Grade of D or PH 217 Minimum Grade of D).

ME 326  Materials Science  3 cr
Mechanical, chemical, and physical properties of materials. Relationship between structure, processing, and properties engineering materials. One-half hour of design.
Pre-requisite: (PH 202 Minimum Grade of C or PH 217 Minimum Grade of C) and (CH 115 Minimum Grade of C or CH 131 Minimum Grade of C) and EG 315 Minimum Grade of C.

ME 328  ME Analysis  4 cr
Numerical solutions of differential equations with applications to ME simulation and design. Introduction to Finite Element Analysis. One-half hour of design.
Pre-requisite: MA 227 Minimum Grade of C and MA 237 Minimum Grade of C and MA 238 Minimum Grade of C.

ME 336  Material Science Lab-W  1 cr
Experimental study on the effect of thermal and mechanical processing on properties.
Pre-requisite: ME 326 Minimum Grade of D and PH 202 Minimum Grade of C and CH 131 Minimum Grade of C and EG 315 Minimum Grade of C. ME 326 can be taken concurrently with this course.

ME 365  Design of Fluid Power Systems  3 cr
Fluid power components are studied in detail. Design of complete hydraulic systems is stressed. One hour of design.
Pre-requisite: EG 284 Minimum Grade of D and EG 315 Minimum Grade of D and (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 328 Minimum Grade of D.

ME 410  Principles of Eng Design-W  3 cr
In this course, students learn to apply engineering theory and methods to the design process. Topics include problem definition, concept development and evaluation, project management, materials selection, risk analysis, quality improvement and ethics in design (0-3-0).
Pre-requisite: ME 314 Minimum Grade of C and EG 231 Minimum Grade of C and ME 336 Minimum Grade of C and ME 317 Minimum Grade of C and ME 316 Minimum Grade of C. ME 336 and ME 317 can be taken concurrently with this course.

ME 411  Thermal System Design  3 cr
Thermal system design using principles of thermodynamics, fluid mechanics, heat transfer, and numerical simulation. Communication of results. Three hours of design.
Pre-requisite: ME 312 Minimum Grade of D and ME 317 Minimum Grade of D and ME 328 Minimum Grade of D and (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D).

ME 412  Thermal Science Laboratory  1 cr
Experimental study of thermal science principles and systems. Communication of results.
Pre-requisite: ME 312 Minimum Grade of D and ME 316 Minimum Grade of D and ME 317 Minimum Grade of D and (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D).

ME 414  Capstone Design  1 cr
This course is considered a "Senior Capstone Course."
Co-requisite: ME 416
Pre-requisite: ME 410 Minimum Grade of D.

ME 416  Capstone Design Project  2 cr
This is a team-based capstone project course. Each team is assigned a unique design problem in mechanical engineering or a closely-related field. Students must be enrolled concurrently in ME 414 - Capstone Design.
Co-requisite: ME 414
Pre-requisite: ME 410 Minimum Grade of D.

ME 417  Dynamics of Machines  3 cr
A study of the effects of external forces and moments on the motion of machines. Topics include the study of the position, velocity and acceleration of machine components during operation and the determination of forces on the connections and members. One hour of design.
Pre-requisite: EG 284 Minimum Grade of D and EG 315 Minimum Grade of D and ME 328 Minimum Grade of D.

ME 419  Computer Aided Design & Manu  3 cr
Introduction to computer aided design (CAD) and computer aided manufacturing (CAM) principles and their practical applications as fundamental elements of contemporary product design and manufacturing. This course is dual listed with an equivalent 500-level mechanical engineering course. One hour of design.
Pre-requisite: ME 135 Minimum Grade of D and ME 314 Minimum Grade of D.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisite(s)</th>
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</thead>
<tbody>
<tr>
<td>ME 421</td>
<td>Mechanical System Design</td>
<td>3 cr</td>
<td>A study of design techniques as applied to mechanical components and systems. Computer simulation and numerical techniques. Communication of results. Three hours of design. Pre-requisite: ME 314 Minimum Grade of D and ME 328 Minimum Grade of D.</td>
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<tr>
<td>ME 422</td>
<td>Gas Turbines</td>
<td>3 cr</td>
<td>Introduction to gas turbines covering thermodynamics, fluid mechanics, combustion, cycle analysis, compressors, turbines and component design. One hour of credit. Pre-requisite: (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 312 Minimum Grade of D.</td>
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<tr>
<td>ME 426</td>
<td>Dynamic Systems and Control</td>
<td>3 cr</td>
<td>Modeling dynamic systems. Introduction to the principles of feedback control systems. Analysis of linear systems. Pre-requisite: (MA 238 Minimum Grade of D or MA 338 Minimum Grade of D) and ME 316 Minimum Grade of D and ME 328 Minimum Grade of D.</td>
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<tr>
<td>ME 429</td>
<td>Controls &amp; Instr. Lab</td>
<td>1 cr</td>
<td>Design and implementation of analog and digital feedback control of systems. Design and implementation of measurement systems, including signal conditioning, analog-to-digital and digital-to-analog conversion, statistical estimation of error, data analysis. Communication of laboratory results is emphasized. Pre-requisite: ME 426 Minimum Grade of D. ME 426 can be taken concurrently with this course.</td>
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<tr>
<td>ME 430</td>
<td>Mechanism Synthesis</td>
<td>3 cr</td>
<td>Kinematic synthesis of planar linkages for function, path, and motion generation. Topics include: degrees of freedom; graphical, linear analytical, and nonlinear analytical methods; and curvature theory. This course is dual-listed with an equivalent 500-level mechanical engineering course. One hour of design. Pre-requisite: EG 284 Minimum Grade of D and ME 328 Minimum Grade of D.</td>
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<tr>
<td>ME 431</td>
<td>Gas Dynamics</td>
<td>3 cr</td>
<td>Introduction to compressible fluid flow. Conservation laws, isentropic flow, adiabatic flow, flow with heat transfer, normal shock. One hour of design. Pre-requisite: (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 312 Minimum Grade of D.</td>
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<tr>
<td>ME 432</td>
<td>Advanced Thermodynamics</td>
<td>3 cr</td>
<td>Continuation of Mechanical Engineering Thermodynamics to develop a broader and deeper understanding of thermal energy transformations. One hour of design. Pre-requisite: ME 312 Minimum Grade of D.</td>
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<tr>
<td>ME 438</td>
<td>Finite Element Analysis</td>
<td>3 cr</td>
<td>Introduction to the finite element method. Engineering application to stress-strain analysis is emphasized. Other field problems are also considered. This course is dual-listed with an equivalent 500-level mechanical engineering course. Pre-requisite: ME 328 Minimum Grade of D.</td>
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<tr>
<td>ME 439</td>
<td>Boundary Elements I</td>
<td>3 cr</td>
<td>Fundamental concepts of the boundary element method of numerically solving partial differential equations. Application to potential flow problems in heat transfer. This course is dual listed with an equivalent 500-level mechanical engineering course. Pre-requisite: ME 328 Minimum Grade of D.</td>
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<tr>
<td>ME 441</td>
<td>Microprocessors for Mech Engr</td>
<td>3 cr</td>
<td>Basic concepts of programming and applying microprocessors to the control of mechanical systems. Assembly language programming. Memory decoding and use. Input and output circuits. Interfacing with the PIA. Pre-requisite: EG 220 Minimum Grade of D and ME 316 Minimum Grade of D.</td>
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<tr>
<td>ME 450</td>
<td>Heat Vent and Air Conditioning</td>
<td>3 cr</td>
<td>Addresses the heating and cooling of buildings. Covers related engineering sciences, cooling and heating loads, systems, and equipment. One hour of design. Pre-requisite: (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 312 Minimum Grade of D and ME 317 Minimum Grade of D.</td>
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<tr>
<td>ME 451</td>
<td>Refrigeration Systems</td>
<td>3 cr</td>
<td>Study of refrigeration systems including solutions of typical engineering design problems. Concepts from fluid mechanics, thermodynamics, and heat transfer are used. One hour of design. Pre-requisite: (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 312 Minimum Grade of D and ME 317 Minimum Grade of D.</td>
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<tr>
<td>ME 452</td>
<td>Combustion</td>
<td>3 cr</td>
<td>Introduction to the theory of combustion processes, chemical equilibrium, adiabatic flame temperatures, reaction kinetics. This course is dual listed with an equivalent 500-level mechanical engineering courses. Pre-requisite: ME 312 Minimum Grade of D.</td>
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<tr>
<td>ME 453</td>
<td>IC Engines</td>
<td>3 cr</td>
<td>Principles for analysis and design of internal combustion (I.C.) engines. Topics: include fuel-air cycles, fuel, air and exhaust flows, heat and mass transfer, engine performance. Pre-requisite: (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 312 Minimum Grade of D and ME 317 Minimum Grade of D.</td>
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</table>
**ME 460** Intro to Marine Engineering 3 cr
Categorization of Ships, Ship Geometry and Hydrostatics,
Ship Stability, Ship Hazards, Resistance and Power,
Propellers and Propulsion Systems, Ship Dynamics and Control.
Pre-requisite: EG 360 Minimum Grade of D and EG 315 Minimum Grade of D.

**ME 461** Turbomachinery 3 cr
Energy transfer between fluid and rotor; fluid flow in turbomachines, centrifugal and axial flow pumps and compressors; radial and axial flow turbines. One hour of design.
Pre-requisite: (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D) and ME 312 Minimum Grade of D.

**ME 466** Aerospace Propulsion 3 cr
Airbreathing engines course. Apply fluids, thermodynamics, and heat transfer to analysis of air breathing engines. Topics to include: ideal cycle analysis, component performance, non-ideal cycle analysis, and blade aerodynamics.
Pre-requisite: ME 312 Minimum Grade of D and ME 317 Minimum Grade of D and (EG 360 Minimum Grade of D or CE 365 Minimum Grade of D or ME 324 Minimum Grade of D).

**ME 467** Intro to Biomedical Eng 3 cr
Survey of topics and current issues in the field of biomedical engineering. Topics include biomechanics, biomedical instrumentation, biomaterials engineering, biomedical imaging, cellular mechanics, tissue engineering, biomedical design and ethics. A portion of the course is devoted to basic biology concepts and principles. Students will review literature and discuss technical and technological developments relevant to biomedical engineering.

**ME 468** Principles of Aircraft Design 3 cr
Introduction to aircraft design, including an understanding of the various components leading to a good conceptual design. Introduction to parameters in aerospace analysis and how they may impact a design. Application of design concepts to an RFP (request for proposal) for design competition.
Pre-requisite: (ME 324 Minimum Grade of D or EG 360 Minimum Grade of D or CE 365 Minimum Grade of D) and ME 312 Minimum Grade of D and ME 317 Minimum Grade of D.

**ME 469** Aircraft Stability and Control 3 cr
Introduction to flight dynamics of aerospace vehicles. Basic overview of stability analysis and linear feedback control.
Pre-requisite: ME 328 Minimum Grade of C and EG 360 Minimum Grade of C.

**ME 470** Aircraft Structural Analysis 3 cr
Introduction to elasticity. Torsion, bending and shearing of thin-walled skin-stringer structures. Failure mechanisms. Buckling of beams and plates. Introduction to finite element analysis and composite structural analysis.
Pre-requisite: EG 284 Minimum Grade of C and EG 315 Minimum Grade of C and ME 328 Minimum Grade of C. ME 328 can be taken concurrently with this course.

**ME 472** Vibration Analysis-Synthesis 3 cr
Steady-state and transient vibration analysis of discrete and continuous systems. Vibration problems as related to design are also included.
Pre-requisite: EG 284 Minimum Grade of C and EG 315 Minimum Grade of C and ME 328 Minimum Grade of C.

**ME 474** Noise and Vibration Control 3 cr
Principles of acoustics; human response to noise; control of noise and vibration by means of vibration isolation, sound barriers, and absorption. One hour of design.
Pre-requisite: ME 472 Minimum Grade of D.

**ME 490** Special Topics 1 TO 3 cr
Topics of current mechanical engineering interest. Prerequisite: Consent of instructor

**ME 494** Directed Studies 1 TO 3 cr
Selected mechanical engineering topics of special or current interest not available to regularly scheduled courses. Prerequisite: Consent of instructor.

**ME 499** Honors Senior Project - H 1 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of Mechanical Engineering study, that will lead to a formal presentation at the Annual Honors Student Colloquium. The senior project will be judged and graded by three faculty, chaired by the honors mentor. This course is required for Honors recognition. A minimum of 4 credit hours is required, but students may enroll for a maximum of 6 credit hours over two semesters. Prerequisites: Completion of an approved project prospectus.

**ME 518** Adv Mechanical Engr Analysis 3 cr
Application of numerical methods including finite differences; finite element and boundary element techniques to the solution of problems in Mechanical Engineering. Prerequisite: Consent of instructor.

**ME 519** Computer Aided Design/Manufac 3 cr
Introduction to computer aided design (CAD) and computer aided manufacturing (CAM) principles and their practical applications as fundamental elements of contemporary product design and manufacturing. This course is dual listed with an equivalent 400-level mechanical engineering course.
ME 520 Advanced Fluid Mechanics 3 cr
Analysis of steady and unsteady motion of a viscous fluid. Topics include: conservation equations, Newtonian fluids and the Navier-Stokes equations, vorticity, analytical solutions, boundary layers, instability of viscous flows. Prerequisite: Consent of instructor.

ME 522 Gas Turbines 3 cr
Introduction to gas turbines covering thermodynamics, fluid mechanics, combustion, cycle analysis, compressors, turbines, and component matching. Pre-requisite: ME 520 Minimum Grade of C.

ME 525 Boundary Layer Theory 3 cr
Development of Navier-Stokes and boundary layer equations, perturbation theory application and boundary layer transition. Prerequisite: Consent of instructor.

ME 530 Mechanism Synthesis 3 cr
Kinematic synthesis of planar linkages for function, path, and motion generation. Topics include: degrees of freedom; graphical, linear analytical, and nonlinear analytical methods; and curvature theory. This course is dual-listed with an equivalent 400-level mechanical engineering course. Prerequisite: Consent of instructor.

ME 538 Finite Element Analysis 3 cr
Introduction to the finite element method. Engineering application to stress-strain analysis is emphasized. Other field problems are also considered. This course is dual-listed with an equivalent 400-level mechanical engineering course. Prerequisite: Consent of instructor. Pre-requisite: MA 507 Minimum Grade of C or MA 508 Minimum Grade of C. MA 507 and MA 508 can be taken concurrently with this course.

ME 539 Boundary Elements I 3 cr
Fundamental concepts of the boundary element method of numerically solving partial differential equations. Application to potential flow problems in heat transfer. This course is dual listed with an equivalent 400 level mechanical engineering course. Requires special permission of instructor.

ME 540 Advanced Heat Transfer 3 cr
Steady and transient conduction, external and internal forced convection, natural convection, radiation with participating media, boiling heat transfer, Stefan condition. Prerequisite: Consent of instructor.

ME 541 Conduction Heat Transfer 3 cr
Closed form analytical and approximate numerical solutions of one, two- and three-dimensional steady state and transient problems in conduction heat transfer. Prerequisite: Consent of instructor. Pre-requisite: MA 507 Minimum Grade of C.

ME 542 Convection Heat Transfer 3 cr
Fundamental laws of motion and energy balance for a viscous fluid, classical solution of the Navier-Stokes and energy equations, laminar/turbulent hydrodynamic and thermal boundary layers, convection heat transfer in laminar/ turbulent internal flows. Prerequisite: Consent of instructor.

ME 543 Radiation Heat Transfer 3 cr
Blackbody radiation, diffuse-gray surfaces, radiative exchange in a multi-surface enclosure, gas radiation in enclosures with participating media, introduction to available numerical methods. Prerequisite: Consent of instructor.

ME 544 Heat Trans - Change of Phase 3 cr
Boiling heat transfer and critical heat flux, condensation heat transfer, Stefan problem, freezing and melting, ablation, introduction to available numerical techniques. Prerequisite: Consent of instructor. Pre-requisite: ME 540 Minimum Grade of C or ME 542 Minimum Grade of C.

ME 545 Exp Fluid Mech and Heat Trans 3 cr
Uncertainty analysis, system response, sampling theory and FFT, differential pressure measurement and multi-hole probes, thermo-couple and RTD, thermal anemometry, LDV and other non-intrusive optical methods, flow visualization. Prerequisites: Consent of instructor

ME 550 Combustion 3 cr
Introduction to the theory of combustion processes, chemical equilibrium, adiabatic flame temperature, reaction kinetics, flame structure. This course is dual-listed with an equivalent 400-level mechanical engineering course. Prerequisite: Consent of instructor.

ME 551 Classical Thermodynamics 3 cr
Postulational treatment of the physical laws of equilibrium, equations of state, processes, equilibrium, stability, reactive systems, phase transition. Prerequisite: Consent of instructor.

ME 552 Statistical Thermodynamics 3 cr
Principles of kinetic theory, quantum mechanics, and statistical mechanics with particular reference to thermodynamic systems. Conclusions of classical thermodynamics are established from the microscopic viewpoint. Prerequisite: Consent of instructor.

ME 553 IC Engines 3 cr
Principles for analysis and design of internal combustion (I.C.) engines. Topics include: fuel-air cycles, fuel, air and exhaust flows, heat and mass transfer, engine performance.

ME 560 Compressible Fluid Flow 3 cr
Foundations of fluid dynamics and thermodynamics of one dimensional flow and heat transfer, isentropic flow, shock waves and method of characteristics. Prerequisite: Consent of Instructor.
ME 561  Turbomachinery  3 cr
Energy transfer between fluid and rotor; fluid flow in
 turbomachines, centrifugal and axial-flow pumps and
 compressors; radial and axial flow turbines. Prerequisite:
 Consent of instructor.

ME 562  Comp Fluid Dyn - Heat Trans I  3 cr
Derivation of conservation equations, numerical solution
 of inviscid and viscous incompressible flow problems,
 emphasis on finite volume method, introduction to finite
 element and spectral method. Prerequisite: Consent of
 instructor.

ME 563  Comp Fluid Dyn - Heat Trans II  3 cr
Governing equations in general coordinates, differential
 geometry for curvilinear coordinates, grid generations,
 numerical uncertainties. Prerequisite: Consent of instructor.
 Pre-requisite: ME 562 Minimum Grade of C.

ME 564  Turbulent Flow  3 cr
Reynolds equations, statistics of turbulence, analysis of
 free and wall turbulence, turbulence models. Prerequisite:
 Consent of instructor.
 Pre-requisite: ME 520 Minimum Grade of C.

ME 565  Lubrication  3 cr
Friction of solids and fluids. Lubricants. Theory of sliding
 bearings. Multi-dimensional bearings with constant forces
 and velocities. Solid, hydrodynamic and gas lubrication.
 Design of bearings. Prerequisite: Consent of instructor.

ME 566  Aerospace Propulsion  3 cr
Airbreathing engines course. Apply fluids, thermodynamics,
 and heat transfer to analysis of air breathing engines. Topics
 to include: ideal cycle analysis, component performance,
 non-ideal cycle analysis, and blade aerodynamics.

ME 567  Principles Biomedical Eng  3 cr
Survey of topics and current issues in the field of biomedical
 engineering. Topics may include biomechanics, biomedical
 instrumentation, biomaterials engineering, biomedical
 imaging, cellular mechanics, tissue engineering, biomedical
 design and ethics. A portion of the course is devoted
 to basic biology concepts and principles. Students will
 review literature and discuss technical and technological
 developments relevant to biomedical engineering.

ME 569  Aircraft Stability and Control  3 cr
Introduction to flight dynamics of aerospace vehicles. Basic
 overview of stability analysis and linear feedback control.
 Co-requisite: MA 507

ME 571  Advanced Engineering Dynamics  3 cr
Three-dimensional kinematics and kinetics of particles and
 rigid bodies, energy, momentum, and stability; application
 of Lagrange's equations to machinery and gyrodynamics.
 Prerequisite: Consent of instructor.

ME 572  Advanced Vibrations  3 cr
Free and forced vibrations of mechanical systems having
 lumped mass and elasticity; introduction to vibrations of
 continuous systems; engineering applications. Prerequisite:
 Consent of instructor.
 Pre-requisite: MA 507 Minimum Grade of C or MA 508
 Minimum Grade of C. MA 507 and MA 508 can be taken
 concurrently with this course.

ME 573  Vibrations of Continuous Sys  3 cr
Equations of motion for strings, membranes, bars, and
 plates with various boundary conditions, steady state and
 transient solutions, exact and approximate methods; wave
 propagation in elastic media. Prerequisite: Consent of
 instructor.
 Pre-requisite: MA 507 Minimum Grade of C.

ME 574  Nonlinear Vibrations  3 cr
Vibrations of damped and undamped systems with nonlinear
 restoring forces; free and forced oscillations in self-
 sustained systems; Hills equation and its application to the
 study of the stability of nonlinear oscillations. Prerequisites:
 Consent of instructor.
 Pre-requisite: ME 572 Minimum Grade of C and MA 508
 Minimum Grade of C.

ME 575  Continuum Mechanics  3 cr
Cartesian tensor analysis. Analysis of stress and strain,
 fundamental laws of continuum mechanics. Constitutive
 equations, application to solid and fluid mechanics.
 Prerequisite: Consent of instructor.

ME 582  Advanced Materials Science  3 cr
Classical and quantum mechanical model of atoms,
 bonding, magnetism, superconductivity, high strength
 low density materials, corrosion, biomedical materials.
 Prerequisite: Consent of the instructor.

ME 583  Applied Elasticity  3 cr
Classical problems in elasticity, torsion and bending theory,
 plane problems in rectangular and polar coordinates;
 axisymmetric problems, thermoelasticity. Prerequisite:
 Consent of instructor.
 Pre-requisite: MA 507 Minimum Grade of C or MA 508
 Minimum Grade of C. MA 507 and MA 508 can be taken
 concurrently with this course.

ME 584  Introductory Metal Theory  3 cr
Theories of metal to explain electrical conductivity and
 scattering process, electronic and lattice heat capacity,
 magnetic behavior, cohesion and lattice constant.
 Prerequisite: Consent of instructor.
 Pre-requisite: MA 507 Minimum Grade of C.

ME 585  Theory of Plates  3 cr
Basic equations of rectangular and circular plates
 with various boundary conditions; classical solutions
 and approximate methods in the theory of thin plates.
 Prerequisite: Consent of instructor.
 Pre-requisite: MA 507 Minimum Grade of C.
ME 586  Theory of Shells  3 cr
Introduction to differential geometry; general equations for arbitrary shells; shallow shell theory with applications; solutions to membrane and bending theory for shells of revolution. Prerequisite: Consent of instructor.
Pre-requisite: ME 585 Minimum Grade of C.

ME 589  Biomechanics  3 cr
Discrete mass and continuum mechanics description of biological materials, biodynamics of limb and gross body motions, various models for injury to head, neck, torso, and extremities. Prerequisite: Consent of instructor.

ME 590  Sp Top -  1 TO 3 cr
Topics of current mechanical engineering interest. Prerequisite: Consent of instructor.

ME 592  Directed Independent Study  1 TO 3 cr
Directed study, under the guidance of a faculty advisor, of a topic from the field of Mechanical Engineering not offered in a regularly scheduled course. Requires permission of the instructor.

ME 594  Projects in Mechanical Engr  1 TO 3 cr
May be repeated for credit. Prerequisite: Approved proposal and consent of director of engineering graduate studies.

ME 599  Thesis  1 TO 6 cr
Thesis research may be taken more than once. Prerequisite: Approved prospectus.

Meteorology (MET)

MET 140L  Intro to Meteorology Lab  1 cr
Laboratory exercises associated with MET 140. Fee. Co-requisite: MET 140

MET 140  Introduction to Meteorology  3 cr
This course focuses on introducing the student to the basic concepts of meteorology. Major topics include the structure of our atmosphere, heat balance, meteorological measurements, atmospheric stability, atmospheric motion, and wind circulations on both the global and local scales. Other areas covered may include an introduction to air masses, fronts, and precipitation processes. The analysis of US Government weather charts is also introduced. Core course.
Co-requisite: MET 140L

MET 191  Tropical Weather Discussion  1 cr
Tropical Weather Discussion is an introductory course in current or recently-active tropical weather systems. This course mainly reviews the structure, behavior, history and potential forecasts of tropical cyclones in the Atlantic, Pacific, and Indian Ocean basins from a meteorological perspective with special emphasis on activity in the Atlantic basin. The course is taught during the Fall Semester because it overlaps with the most active period of the Atlantic Hurricane Season. Other tropical weather topics such as El Nino, La Nina, monsoon troughs, tropical upper-tropospheric troughs, Madden Julian Oscillation, and hurricane climatology are discussed during weeks of inactivity when no tropical cyclones may be occurring. This course may be repeated for credit up to two times for a total of three hours; however, the course may only count once toward a meteorology elective.

MET 342  Severe Weather  3 cr
A study of the causes, structure and impact of tornadoes, hurricanes, thunderstorms and severe weather systems (Identical to GEO 342).
Pre-requisite: MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C.

MET 353  General Meteorology  4 cr
An overall view of the field of meteorology for science majors and minors. This course uses a quantitative approach to study the composition of the atmosphere, atmospheric processes, global circulation, and storm development. Laboratory exercises pay particular attention to hands-on analysis of meteorological charts (identical to GEO 353.) Fee.
Pre-requisite: (MET 140 Minimum Grade of D and MET 140L Minimum Grade of D) and ( (MA 112 Minimum Grade of C or MA 171 Minimum Grade of C) or (MA 113 Minimum Grade of C or MA 172 Minimum Grade of C) or (MA 125 Minimum Grade of C or MA 132 Minimum Grade of C).

MET 354  Dynamic Meteorology I  3 cr
Dynamic meteorology is the study of atmospheric motions that control our weather and climate. Using fundamental laws of physics (fluid dynamics and thermodynamics), a set of mathematical equations that describe how the atmosphere behaves, is derived. These equations are too complex to solve analytically, but with certain assumptions they can be simplified so that approximate solutions can be found. Even though approximate, these solutions still give useful information about the current state of the atmosphere and its evolution into the future. The theories derived in dynamic meteorology underlie all forecasting rules and techniques. Thorough understanding of these theories is invaluable to becoming a skilled forecaster.
Pre-requisite: (MA 126 Minimum Grade of C or MA 233 Minimum Grade of C) and (PH 201 Minimum Grade of C or PH 216 Minimum Grade of C).
MET 355 Dynamic Meteorology II 3 cr
The circulation of the atmosphere and the structure of storms is quantitatively analyzed using equations of atmospheric flow. The jet stream, atmospheric waves, mid-latitude cyclones, and the concept of vorticity are given considerable attention.
Pre-requisite: MET 354 Minimum Grade of C or GEO 344 Minimum Grade of C or GEO 354 Minimum Grade of C.

MET 356 Physical Meteorology 3 cr
A detailed investigation of adiabatic processes, thermodynamic diagrams, atmospheric stability, and precipitation processes. Additional topics include atmospheric composition and aerosols, radiation and electricity.
Pre-requisite: (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C) and (MA 126 Minimum Grade of C or MA 233 Minimum Grade of C) and (PH 201 Minimum Grade of C or PH 216 Minimum Grade of C). MET 353 and GEO 353 and MA 126 and MA 233 and PH 201 and PH 216 can be taken concurrently with this course.

MET 357 Meteorological Instrumentation 2 cr
Design, calibration, use and maintenance of existing and newly developed meteorological instruments and instrumentation systems. Analysis of data collected by instruments and instrument systems.
Pre-requisite: (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C).

MET 358 Radar Meteorology 4 cr
This course is designed to give the student a three-fold introduction to weather radar and its value in the workplace. Basic radar principles and assumptions applicable to all radars are presented; the Doppler function and limitations are covered in depth with final emphasis on properly utilizing weather radar in an operations setting.
Pre-requisite: (MET 354 Minimum Grade of C or GEO 344 Minimum Grade of C or GEO 354 Minimum Grade of C) and (PH 202 Minimum Grade of C or PH 217 Minimum Grade of C).

MET 359 Introduction to TV Weather 2 cr
This course gives the students the basic skills necessary for broadcasting weather information on TV. This course will focus on the basic principles and techniques of effective TV weather broadcasting.
Pre-requisite: (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C).

MET 360 Atmospheric Analysis 1 cr
Analysis of meteorological charts. Provides additional preparation prior to Synoptic. Fee.
Pre-requisite: (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C) and (MET 354 Minimum Grade of C or GEO 344 Minimum Grade of C or GEO 354 Minimum Grade of C).

MET 370 Satellite Meteorology 3 cr
This course is an introduction to the weather satellite and its influence on meteorological observations and forecasting. Both radiative propagation theory and satellite interpretation of meteorological features will be covered extensively.
Pre-requisite: MET 356 Minimum Grade of C and (PH 202 Minimum Grade of C or PH 217 Minimum Grade of C).

MET 401 Weather Forecasting I 2 cr
A course specifically designed for students minoring in Meteorology. Students are introduced to weather forecasting concepts and methods.
Pre-requisite: (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C).

MET 402 Weather Forecasting II 2 cr
A course specifically designed for students minoring in Meteorology. Weather forecasting techniques are discussed with an emphasis on the use of meteorological models and severe weather forecasting.
Pre-requisite: MET 401 Minimum Grade of C.

MET 410 MET Phenomenology - W 3 cr
This class is an introduction to reading meteorological journal and professional writings and to writing some of the standard scientific forms common in both operational and research meteorology: summaries, conference abstracts, and scientific journal articles. The students will engage in brief examination of some of the fundamental phenomena in the atmosphere through selected journal articles and write about these topics in an appropriate manner as inquisitive meteorologists.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C) and (MET 353 Minimum Grade of C or GEO 354 Minimum Grade of C) or MET 401 Minimum Grade of C.

MET 420 Computer Apps in Earth Science 4 cr
An introduction to basic Python programming, with examples and exercises pertinent to Earth Science and GIS applications.
Pre-requisite: MA 112 Minimum Grade of D or MA 110 Minimum Grade of C.

MET 430 Mesoscale Meteorology 3 cr
Assessment of mesoscale phenomena, including frontogenesis and frontolysis, low-level jet streams, nocturnal boundary layer wind maxima, sea and land breezes, gravity waves, dry lines, lake-effect snow, and deep moist convection. Emphasis on scale analysis, subsynoptic-scale dynamics, interactions with larger-scale processes, and case study examples.
Pre-requisite: (MET 355 Minimum Grade of C or GEO 345 Minimum Grade of C or GEO 355 Minimum Grade of C).
MET 440  Air Pollution Meteorology  2 cr  
Air Pollution Meteorology is a survey course in air pollution topics taught primarily from an atmospheric perspective. This course covers topics on air pollution history, methods of measuring air quality, sources of air pollution, basic atmospheric pollution dispersion concepts, basic principles of air pollution modeling and prediction, and an overview of the impacts of polluted air on human health and the environment. Pre-requisite: MET 140 Minimum Grade of C or GEO 101 Minimum Grade of C and MA 110 Minimum Grade of C.

MET 442  Tropical Meteorology  2 cr  
This course presents an overview of meteorology in the tropics. The tropical realm is defined and the importance of solar radiation and distribution of temperature, moisture and precipitation in driving tropical weather systems is discussed. The general circulation in the tropics is explored along with seasonal and non-seasonal variations, including the Monsoon and El Nino/La Nina. Certain mesoscale and local circulations common to the tropics are also discussed. Several weeks will be spent investigating tropical cyclones. Pre-requisite: MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C.

MET 443  Climatology - W  3 cr  
Analysis of global climate as aggregate weather. Component elements, factors controlling distribution, resulting area patterns, and climatic classification are studied (identical to GEO 443). Fee Pre-requisite: MET 140 Minimum Grade of C or GEO 101 Minimum Grade of C.

MET 454  Synoptic Meteorology I  6 cr  
Principles of dynamic and physical meteorology are applied to current surface and upper air analyses of frontal cyclones. An emphasis is placed on forecasting techniques, daily weather discussions, continuity and analysis. Pre-requisite: MET 355 Minimum Grade of C and MET 356 Minimum Grade of C.

MET 455  Synoptic Meteorology II  6 cr  
This course continues the development of principles learned in MET 454. Principles of atmospheric dynamics and conceptual models will be studied and employed through the use of surface and upper air analyses, satellite and radar data. A multi-week overview of numerical weather prediction principles and concepts will be accomplished along with the integration and interpretation of model guidance of actual modeling simulations using basic concepts of numerical weather prediction. Topics on mid-latitude cyclones and fronts will continue to be expanded beyond Synoptic I. Ensemble prediction and atmospheric oscillations will be discussed along with intrinsic predictability limitations. This course serves as the capstone class for meteorology majors. Pre-requisite: MET 454 Minimum Grade of C.

MET 456  Applied Climatology - W  3 cr  
Training in the application of climatology to solve real world problems. In addition to an examination of present day climate patterns, their causes, and mechanisms, the course focuses on the El Nino, recent and past climates, the natural and human impact on the Earth's energy balance, global warming, ozone hole and the chaos theory. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (MET 353 Minimum Grade of C) and (MET 355 Minimum Grade of C) and (MET 341 Minimum Grade of C) and (GEO 353 Minimum Grade of C) and (MET 341 Minimum Grade of C). EH 102 and MET 353 can be taken concurrently with this course.

MET 490  Sp Top -  1 TO 4 cr  
Meteorological topics not covered in current meteorology courses. May be repeated when content varies for a maximum of four hours. May require permission of instructor.

MET 492  Seminar -  1 TO 4 cr  
Departmental seminar investigating a special field of meteorology. (Topic announced prior to registration.) May be repeated when content varies for a maximum of eight hours. Requires permission of instructor.

MET 494  Directed Studies  1 TO 4 cr  
Independent research in field, laboratory, or library under the direction of a member of the meteorology faculty. Prerequisite: Requires permission of instructor. May be taken for a total of eight hours.

MET 495  Mesonet Internship  1 cr  
Students will learn various aspects of mesonet (mesoscale weather station network) operation and maintenance. Students will take part in routine weather station site visits, emergency site visits when a sensor malfunctions, and quality control of incoming data. Once a year every weather station receives a complete retrofit where all sensors are replaced with freshly calibrated sensors. If such a retrofit occurs during the semester of a student? s internship, the student will be given the opportunity to take part in this process as well. A large component of this course will consist of field work. Depending on student schedules and mesonet behavior, time will also be spent in the lab performing manual data quality control using the USA Mesonet website. Pre-requisite: (MET 353 Minimum Grade of C or GEO 353 Minimum Grade of C) and (MET 355 Minimum Grade of C or GEO 353 Minimum Grade of C) and (MET 341 Minimum Grade of C) and (GEO 353 Minimum Grade of C) and (MET 341 Minimum Grade of C).

MET 496  Internship in Meteorology  1 TO 3 cr  
On-the-job learning through occupational, professional, or research work with an approved firm, agency, or meteorology faculty member. Open only to meteorology majors. Prerequisite: Permission of department chair.
MET 497 Broadcast Meteorology Pract I 3 cr
This course focuses on introducing the student to the ever evolving technology in broadcast meteorology. Emphasis is placed on the application of meteorological data through the use of professional television weather graphics systems in order to develop a “weather story”. Particular attention is given to the use of chroma key mechanics/techniques for public viewing.
Pre-requisite: MET 359 Minimum Grade of C.

MET 498 Broadcast Meteorology Pract II 3 cr
This course focuses on communicating accurate forecasts and other important weather information to the public. Attention is given to fine-tuning the on-air weather presentation style, as well as developing a professional resume tape of weather shows in order to gain employment as a broadcast meteorologist. Special attention is given to severe weather cut-ins and accurately conveying severe weather threats to the public.
Pre-requisite: (MET 355 Minimum Grade of C or GEO 345 Minimum Grade of C or GEO 355 Minimum Grade of C) and MET 497 Minimum Grade of C. MET 355 can be taken concurrently with this course.

MET 540 Topics in Air Pollution MET 3 cr
Topics in Air Pollution Meteorology is a graduate course on advanced air pollution topics taught primarily from an atmospheric perspective. This course provides an overview of “dry” meteorological processes, such as temperature, pressure, wind, and general circulation combined with topics on air pollution history, methods of measuring air quality, sources of air pollution, atmospheric pollution dispersion concepts, principles of air pollution modeling and prediction, and the impacts of polluted air on human health and the environment.

MET 590 Meteorology 1 TO 6 cr
An in-depth course for advanced students in meteorology. Topics and titles will be selected to examine the subject matter in an area of current interest to students and in an area of particular faculty expertise. Includes specialized topics not currently listed in the Bulletin.

MET 594 Grad Dir St in Meteorology- 1 TO 4 cr
Graduate level independent study in Meteorology under the direction of a member of Meteorology’s Graduate Faculty. Student must have an approved topic and must be accepted by a Graduate Faculty mentor before registering for this class. Prerequisite: Graduate standing.

MIC 480 Molec Basis of Pathogenesis 1 TO 4 cr
Bench research on the biology or the Rickettsiales family of intracellular pathogens and on the pathogenesis of the diseases caused by these organisms. Participation in ongoing research or initiation of new projects are possible.

MIC 530 Microbes & Host Defense 3 cr
Presents the fundamental aspects of microbiology including morphology, metabolism of micro-organisms, the basic principles of the use of antibiotics and chemotherapeutic agents, microbial genetics, virology, and medical microbial ecology. The principles of immunology and infection in relation to clinical disease are discussed with special emphasis on laboratory diagnosis.

MIC 536 Literature Reports 1 cr
Students and faculty participate in a supervised reading of the current literature and meet periodically to interact in a discussion of the selected article or topic. The goal of this course is to maintain the faculty’s and students’ level of information at a “state of the art” in both methods and theory in the discipline and to develop critical skills in reviewing the literature.

MIC 537 Dir St - Microbiology 1 TO 6 cr
Students participate in research under the direction of a graduate faculty member. This course should be taken by students who have completed their lab rotations, but have not yet submitted a formal research proposal.

MIC 590 Sp Top - 1 TO 3 cr
Each course provides in-depth tutorial exposure to specific areas in the discipline. Student and/or faculty presentations followed by group discussions, examine the subject matter in an area of current interest either to one student or a group of students. Credit and title are arranged with an individual faculty member.

MIC 630 Adv Microbial Pathogenesis 3 cr
This course discusses the fundamentals of this area with particular emphasis on Escherichia coli and Salmonella typhimurium as model systems. The development of problem solving skills will be stressed. Topics including aerobic vs. anaerobic metabolism, membrane physiology, biosynthesis of macromolecules and regulation of gene expression provide view of microbial cell.
Pre-requisite: IDL 580 Minimum Grade of B and IDL 581 Minimum Grade of B.

MIC 632 Advanced Immunology 3 cr
Selected topics in immunology are considered using formal lectures followed by student presentations. Design and interpretation of immunological experiments are emphasized throughout the course.
Pre-requisite: IDL 580 Minimum Grade of B and IDL 581 Minimum Grade of B.
**MIC 633 Advanced Virology 3 cr**
This course reviews the reproductive cycles of important human viruses and subviral agents and the diseases they cause. The focus is on the molecular biology of animal viruses and their mechanisms of regulation, assembly, and pathogenesis. Human immunodeficiency virus will be considered in detail. The course is constructed as an interactive lecture series with student reports and literature surveys.
Pre-requisite: IDL 580 Minimum Grade of B and IDL 581 Minimum Grade of B.

**MIC 636 Microbiology-Immun Res Sem 1 cr**
Students present a research topic for discussion before members of the department. Usually scheduled on a rotational basis. Student participation required after end of second year. Attendance required.

**MIC 799 Research-Dissertation 1 TO 6 cr**
Independent research by the student under the sponsorship of the graduate faculty in individual departments in the Basic Medical Sciences. Students are required to submit a research project description form before enrolling in this course. Progress reports of the work accomplished are required every six months.

**Military Science (MS)**

**MS 101 Basic Leadership Skills I 1 cr**
An introductory course of instruction and participation in common military task and leadership skills. Students are encouraged to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every other week. Fee.

**MS 102 Basic Leadership Skills II 1 cr**
A continuing course of instruction and participation in individual common military task and leadership skills. Students are encouraged to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every other week. Fee.

**MS 201 Intermediate Military Skills I 3 cr**
A further development of common task and leadership skills required to prepare cadets to lead small military units. Emphasis on practical application of basic military skills and ability through development of leadership skills. Students are required to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every other week. Fee.
Pre-requisite: MS 101 Minimum Grade of D and MS 102 Minimum Grade of D.

**MS 202 Inter Military Skills II 3 cr**
A further development of common task and leadership skills required to prepare cadets to lead small military units. Emphasis on practical application of basic military skills and ability through development of leadership skills. Students are required to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every other week. Fee.
Pre-requisite: (MS 101 Minimum Grade of D and MS 102 Minimum Grade of D) or MS 201 Minimum Grade of D.

**MS 301 Adaptive Team Leadership 3 cr**
Challenges cadets to study, practice, and evaluate adaptive leadership skills as they are presented with challenging scenarios related to military operations containing ethical dilemmas. Cadets receive systematic and specific feedback on their leadership attributes and actions. Based on such feedback, as well as their own self-evaluations, cadets continue to develop their leadership and critical thinking abilities. Cadets also conduct physical fitness training three times per week focusing on development of individual flexibility, muscular strength, and cardio-respiratory endurance. Students are required to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every week. Contact Hour Distributions: 3 hours and 1 lab. Fee.

**MS 302 Applied Team Leadership 3 cr**
Increasingly intense situational leadership challenges in order to develop a cadet’s awareness and critical thinking skills while in a leadership role. Cadets review aspects of combat, stability, and support operations. They also conduct military briefings and develop proficiency in the operational orders process. Cadets also conduct physical fitness training three times per week focusing on development of individual flexibility, muscular strength, and cardio-respiratory endurance. Students are required to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every week. Fee.
Pre-requisite: MS 301 Minimum Grade of C.
MS 401  The Army Profession 3 cr
MS 401 introduces Cadets to the challenges of mission command and gaining an understanding of the Army Profession. Cadets learn the basics of what mission command is and how it is used in Army operations. Students will examine the Army Profession and what it means to be a professional in the U.S. Army. The overall focus is on developing basic knowledge and comprehension of Army leadership while gaining a big picture of understanding the Reserve Officers’ Training Corps (ROTC) program, its purpose in the Army, and its advantages for the student. In addition, MSL IVs are rotated through a variety of leadership positions that support a variety of ROTC battalion training and recruiting events throughout the semester where the MSL IV student will receive detailed and constructive feedback on their leader attributes and core leader competencies from experienced cadre. Students are required to attend Physical Training (PT) Lab three (3) times per week for 1 hour per session and a 2 hour leadership lab every week. Fee.
Pre-requisite: MS 301 Minimum Grade of C and MS 302 Minimum Grade of C.

MS 402  The Company Grade Officer 3 cr
MSL 402 explores the dynamics of leading Soldier’s in Full Spectrum Operations in the Operating Environment (OE). This course will introduce you to the Army Operating Concept, Combatant Commands (COCOM), and Unified Land Operations. Additionally, it will discuss platoon leadership, how to take charge of your platoon and the additional duties you may have as a 2LT. Students will continue to examine the Army Profession and what it means to be a professional in the U.S. Army. The overall focus is on broadening the students knowledge of the Army.
Pre-requisite: MS 401 Minimum Grade of C.

MS 494  Directed Studies 1 TO 3 cr
Directed study and research. May be repeated in different subject areas. Course work will be specified by the instructor prior to the beginning of the semester. Studies may include but are not limited to research papers, special projects, and leadership seminars. One and three hour courses are available. Fee.

MUM 201  Intro to Museum Studies 3 cr
This course is designed to provide a general introduction to museum history, practice, and the role of museums in contemporary society. The class will explore a range of museum positions, curatorial practices, collection management, museum administration, and the academic and public roles museums play in society.
Pre-requisite: EH 102 Minimum Grade of C.

MUM 290  Special Topics - 3 cr
Different subjects or themes in museum studies as announced. This course may be repeated twice when content varies, for a maximum of nine credit hours.
Prerequisite: To be announced.

MUM 390  Special Topics - 3 cr
Different subjects or themes in museum studies as announced. This course may be repeated twice when content varies, for a maximum of nine credit hours.
Prerequisite: To be announced.

Music Education (MUE)

MUE 010  Music Education 0 cr
The Piano Proficiency documents mastery of minimum piano proficiency skills for students who do not need to enroll in class piano.

MUE 102  Elementary Class Piano 1 cr
Functional keyboard playing. Open to music majors and minors only. No previous knowledge in piano necessary. To be taken in sequence. Fee.

MUE 103  Elementary Class Piano 1 cr
Functional keyboard playing. Open to music majors and minors only. Fee.
Pre-requisite: MUE 102 Minimum Grade of D.

MUE 120  Elementary Class Voice 1 cr
Beginning voice instruction emphasizing the fundamentals of singing and the vocal mechanism. This is the first semester of a two semester sequence.

MUE 121  Intermediate Class Voice 1 cr
This course is a continuation of MUE 120. Vocal fundamentals and the mechanics of singing will be emphasized. More advanced vocal exercises, diction, and interpretation will be stressed.
Pre-requisite: MUE 120 Minimum Grade of D.

MUE 170  Elementary Class Percussion 1 cr
Beginning percussion instruction with emphasis on development of sight-reading, concert style/mallet techniques and basic concepts of percussion instruments.

MUE 182  Elementary Class Guitar 1 cr
Beginning guitar instruction with the development of proficiency in sight reading and correct right and left hand techniques. No previous knowledge of guitar is necessary. Open to any university student except guitar majors. To be taken in sequence.

MUE 183  Elementary Class Guitar 1 cr
Beginning guitar instruction with the development of proficiency in sight reading and correct right and left hand techniques.
Pre-requisite: MUE 182 Minimum Grade of D.
MUE 202  Intermediate Class Piano  1 cr
A continuation of elementary class piano including sight reading and keyboard harmony. Open to music majors and minors only. Fee.
Pre-requisite: MUE 103 Minimum Grade of D.

MUE 203  Intermediate Class Piano  1 cr
A continuation of elementary class piano including sight-reading and keyboard harmony. Open to music majors and minors only. Fee.
Pre-requisite: MUE 202 Minimum Grade of D.

MUE 212  Adv Keyboard Musicianship I  1 cr
MUE 212 is the first of four courses required of all concentration level and performance level piano majors. During the course, students develop sight reading ability, read lead sheets, learn accompanying strategies and practice systematic piano technique. Class piano pedagogy is also addressed. Prerequisite: Piano major or concentration. Fee.

MUE 213  Adv Keyboard Musicianship II  1 cr
The second of four courses required of all concentration level and performance level piano majors. During the course, students develop sight-reading ability, read lead sheets, learn accompanying strategies and practice systematic piano technique. Class piano pedagogy is also addressed. Fee.
Pre-requisite: MUE 212 Minimum Grade of D.

MUE 236  Mus-Lit Integ for Early Childhd  3 cr
This course examines the use of music and literature integration in the early childhood classroom - establishing an active-learning environment, identifying elements of music in children's literature, engaging students in the storytelling process, and preparing music-literature instruction.

MUE 240  String Methods  1 cr
The techniques of teaching the string instruments in class situations and the development of some proficiency on each string instrument.

MUE 241  Woodwind Methods  1 cr
The techniques of teaching the woodwind instruments in class situations and the development of some proficiency on each of the main woodwinds.

MUE 242  Brass Methods  1 cr
The techniques of teaching the brass instruments in class situations and the development of some proficiency on each of the main brass instruments.

MUE 243  Percussion Methods  1 cr
The techniques of teaching percussion instruments in class situations and the development of some proficiency on all percussion instruments.

MUE 301  Music Literacy Child and Youth  3 cr
The fundamentals of music, music reading, and instruction for those working with children and youth in group settings.

MUE 312  Adv Keyboard Music III Vocal  1 cr
MUE 213 is the third of four courses required of all concentration and performance level piano majors. Students will develop sight reading ability, read lead sheets, learn accompanying strategies and practice systematic piano technique. Vocal accompanying workshops and class piano pedagogy are included. Fee.
Pre-requisite: MUE 213 Minimum Grade of D.

MUE 313  Adv Keyboard Music IV Inst  1 cr
MUE 313 is the fourth of four courses required of all concentration and performance level piano majors. During the course, students develop sight reading ability, read lead sheets, learn accompanying strategies and practice systematic piano technique. Instrumental accompanying workshops and class piano pedagogy are included. Fee.
Pre-requisite: MUE 312 Minimum Grade of D.

MUE 322  Early Child/Elem Mus Perf Mthds  3 cr
The study of music and performance methods as used in dance and theatre throughout various early childhood and elementary settings.

MUE 336  Performing Arts for Young Child  3 cr
This course provides an overview of the planning, preparation, and delivery of the performing arts in a developmentally appropriate environment. Students will explore dramatic arts, improvisation, use of musical instruments, and vocal exploration as a means of communication, expression, and learning for the young child. Appropriate learning environments and routines will be discussed regarding the individual child's needs of social, physical, and sensory motor skills and the role of facilitating the growth through discovery.

MUE 346  Marching Band Techniques  1 cr
The techniques of organization, administration, instruction, and rehearsal of the marching band.

MUE 411  Woodwind Pedagogy  2 cr
A survey of the teaching techniques, instruments, accessories and pedagogical materials for woodwind instruments. Prerequisite: Upper division studio study in woodwinds or permission of instructor

MUE 412  Brass Pedagogy  2 cr
This course is intended as a technique course specific to high and low brass instruments. Topics of study will include: development of technique, etudes, performance preparation, pedagogical literature, performance anxiety. Upper division studio study in brass or permission of instructor.

MUE 413  Percussion Pedagogy  2 cr
A comprehensive study of methods and materials used to teach percussion instruments. Upper division studio study in percussion or permission of instructor.
MUE 414 Guitar Pedagogy  2 cr
A survey of the teaching techniques, instruments, accessories and pedagogical materials for guitar. Prerequisite: Upper division studio study in guitar or permission of the instructor.

MUE 415 String Pedagogy  3 cr
A comprehensive study that is intended as a technique course specific string instruments. Topics of study include: development of technique, performance preparation, pedagogical literature, and performance anxiety. Prerequisite: Upper division studio study in strings or permission of instructor.

MUE 430 Exceptional Music  3 cr
The philosophical and practical approach to increasing the effectiveness of learning and content retention for the exceptional student through music.

MUE 434 Keyboard, Voice, Guitar  3 cr
The study of music literature, note reading, and the effective practice of incorporating keyboard, voice, and guitar through music education and music therapy.

MUE 436 Integrating Arts in Education  1 TO 3 cr
This course examines arts integration as a philosophical approach to increasing the effectiveness of learning and content retention in the PK-12 classroom.

MUE 444 Elementary/General Music  3 cr
Music program, methods, music literature, and teaching aids for elementary and middle school students. Prerequisites: Junior level or above in music education, concentration, admission to candidacy, completion of two-thirds of teaching field. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MUE 446 Piano Pedagogy  2 cr
Methods and materials for the private lesson. Lab practice in teaching included. Offered in alternate years. Prerequisite: Piano major or piano concentration.

MUE 448 Vocal Pedagogy  2 cr
Theory and practice of the art of teaching singing as it relates to Voice Science, with regard to both current and historical practices, physiology, function, acoustics, observations, and hands-on experience. Prerequisite: Upper division in vocal studio studies or permission of instructor.

MUE 455 Tch Mu in Middle-Scndary Sch  3 cr
Assists the student in organizing materials and in developing methods of teaching music in middle and secondary schools. Prerequisites: Junior level or above in music education concentration, admission to candidacy, completion of two-thirds of teaching field.

MUE 494 Directed Studies -  1 TO 3 cr
An individual project concerned with the student's special interests in music education. May be repeated for a maximum of six hours. Prerequisite: Department Chair permission.

MUE 501 Instrumental Music Education  3 cr
Study of the organization, development, appraisal, role and future trends of instrumental programs in the public schools.

MUE 512 Foundations of Music Education  4 cr
Sequential study of major philosophies guiding music teaching and the history of music education that have led to contemporary issues and problems in Music Education. Major philosophies including Pestalozzi, Reimer, and the praxial approach of Mark and history from perspectives of sociology, psychology, philosophy, curriculum, history and comparative curricula, including emerging trends in the profession.

MUE 513 Curr and Assess in Music Ed  4 cr
Critical evaluation of current literature, research, and assessment tools used in the curriculum and teaching of music. This course examines the relationship between curriculum theory and philosophy of music education. Through the study of traditional and contemporary models of curriculum development and evaluation, students broaden their understanding of curriculum as it impacts the learning process. Field experience required.

MUE 515 String Pedagogy  3 cr
A comprehensive study that is intended as a technique course specific to all string instruments. Topics of study will include: development of technique, etudes, performance preparation, pedagogical literature, and performance anxiety.

MUE 519 Brass Pedagogy  3 cr
A teaching techniques course specific to brass instruments. Topics of study will include teaching philosophy and techniques, pedagogical literature, lesson structure, and resources for further brass research.

MUE 520 Adv Stdy in EC/Elem/Gen Music  4 cr
Music supervision and administration, program development, conducting children's choirs, inclusion, instructional materials and innovative teaching techniques for early childhood and elementary music programs, including Kodaly, Orff, Dacroz, and Gordon.

MUE 534 Keyboard, Voice, Guitar  3 cr
The study of music literature, note reading, and the effective practice of incorporating keyboard, voice, and guitar through music education and music therapy.

MUE 536 Integrating Arts in Education  1 TO 3 cr
This course examines arts integration as a philosophical approach to increasing the effectiveness of learning and content retention in the PK-12 classroom.
MUE 540 Adv Study in Tchg Choral Music 4 cr
Focus of the course is to enhance the student's knowledge of rehearsal techniques and instructional strategies, strengthening the role of the conductor, techniques for analytical preparation of choral music, and organization of choral programs. Emphasis will also be given to expanding knowledge of choral repertoire and resources for the choral conductor.

MUE 548 Graduate Vocal Pedagogy 2 cr
Vocal Pedagogy is a 2 credit hour course for the upper level undergraduate voice major and graduate vocal performance majors. It focuses on the art, science and profession of teaching singing. Class meetings will be dedicated to lecture, class discussion, presentations, and workshops with various pedagogical and voice science topics.

MUE 560 Adv Study in Tchg Instr Music 4 cr
The purpose of this course is to help the student develop teaching materials, gain greater familiarity with instrumental music repertoire, and develop instructional strategies for instrumental music. Emphasis will be placed on rehearsal procedures, analytical techniques, organizational structure, instrumental music program management, and advanced instrumental conducting.

MUE 564 Woodwind Pedagogy 3 cr
This course involves the study of teaching principles of the woodwind family, with specialized instruction given to students' primary woodwind instrument. Focusing on the art of teaching by examining pedagogical concepts and history, woodwind performance majors will experience teaching demonstrations and the discovery of new and standard teaching literature for woodwind instruments.

MUE 565 Practicum in Music Education 1 TO 4 cr
Observation and involvement in the teaching of undergraduate music courses at the college level with opportunities for individual research and teaching experiences.

MUE 567 Percussion Pedagogy 2 cr
A comprehensive study of methods and materials used to teach percussion instruments.

MUE 589 Reading and Conference 1 cr
Guided study in preparation of the portfolio-video recording and self critique, pedagogical project and research paper - which should be taken in conjunction with preparation of the final portfolio.

MUE 590 Special Topics - 1 TO 3 cr
Special topics in music education designed to meet specific needs and special interests, and to explore current issues in the field. May be repeated for a maximum of nine hours when content varies. Requires permission of department chair.

MUSIC LITERATURE (MUL)

MUL 101 Introduction to Music 3 cr
Music, what it is and how to listen to it; basic materials of music and the great style periods of music literature in the Western World. Attendance at approved concerts is required.

MUL 201 Contemporary Music 3 cr
An introduction to music-literature trends in the 20th century.

MUL 235 Survey Musical Masterworks I 2 cr
This course is the first of a two semester sequence and will familiarize the student with the vocabulary, traditions, conventions, genres, and repertoire of the art music world. The course will focus on the 'greatest hits' of the concert repertory and other works of a regional/timely interest. Pre-requisite: MUL 113 Minimum Grade of C.

MUL 236 Survey Musical Masterworks II 2 cr
This course is the second of a two semester sequence and will familiarize the student with the vocabulary, traditions, conventions, genres, repertoire of the art music world. The course will focus on the 'greatest hits' of the concert repertory and other works of a regional/timely interest. Pre-requisite: MUL 235 Minimum Grade of D.

MUL 315 History of Music Theatre - W 3 cr
A comprehensive overview of the origins and evolution of American Music Theatre to present time. The course also includes both general and specific information toward appropriate performance choices. Cross-listed with DRA 315. Credit cannot be received for both DRA 315 and MUL 315.

MUL 335 History of Music I - W 3 cr
Music of the Western World from pre-Christian times to 1750: evolution of forms, styles, and media. Pre-requisite: MUT 113 Minimum Grade of C and MUL 236 Minimum Grade of D and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MUL 336 History of Music II - W 3 cr
Music of the Western World from 1750 to the present: evolution of forms, styles, and media. Pre-requisite: MUL 335 Minimum Grade of D and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

MUL 411 Woodwind Literature 3 cr
A survey of the major works of the solo, concerto, and chamber music repertoire for the woodwind instruments. Prerequisites: Upper division studio study in woodwinds or permission of instructor.

MUL 412 Brass Literature 3 cr
A survey of the major works of the solo, concerto, and chamber music repertoire for brass instruments. Prerequisite: Upper division brass studio study or permission of instructor.
MUL 413  Percussion Literature  3 cr
A survey of the major works of the solo, concerto, and chamber music repertoire for percussion instruments. Prerequisite: Upper division studio study in percussion or permission of instructor.

MUL 414  Guitar Literature  3 cr
A survey of the major works of the solo, concerto, and chamber music repertoire for guitar. Prerequisite: Upper division studio study in guitar or permission of instructor.

MUL 415  String Literature  3 cr
A survey of the major works of the solo, concerto, chamber music repertoire for string instruments. Prerequisite: Upper division studio study in strings or permission of instructor.

MUL 438  Keyboard Literature  3 cr
Major works and styles in the keyboard literature from English Virginalists through the contemporary period. Offered in alternate years. Prerequisites: Upper division piano study or instructor permission.

MUL 442  Organ Literature  3 cr
Music for pipe organ, both secular and sacred. Offered in alternate years. Prerequisites: Upper division organ study or instructor permission.

MUL 444  Vocal Solo Literature  3 cr
A comprehensive overview of standard solo vocal repertoire within the foundation of historical performance practice of sacred and secular vocal music from its beginnings to the present. Pre-requisite: MUL 335 Minimum Grade of D and MUL 336 Minimum Grade of D.

MUL 494  Dir St -  1 TO 3 cr
An individual project concerned with the student's special interests. May be repeated for up to 6 hours. Requires Department Chair permission.

MUL 501  Graduate Research in Music  2 cr
Methods and materials of research in music. Bibliography and bibliographical aids. Introduction to musicology. Critical and historical writing. A survey of references and sources consulted in graduate music courses; format for papers and thesis, including footnotes and bibliography.

MUL 512  Brass Literature  3 cr
A survey of the major works of the method, solo, orchestral, and chamber music repertoire for brass instruments.

MUL 515  String Literature  3 cr
A survey of the major works of the solo, concerto, and chamber music repertoire for string instruments.

MUL 530  Symphonic Literature  3 cr
A survey of the development of the symphony and related forms from its origins through the twentieth century.

MUL 535  American Music  4 cr
Early music in the colonies. Various attempts to create an individual 'American' musical style. Diversity of influences: European, African American, Native American, Spanish-Mexican, religious, jazz, folk song, minstrel, etc. Music of Billings, Mason, Gottschalk, MacDowell, Sousa, Ives, Gershwin, Copland, and others.

MUL 544  Art Song Literature & History  2 cr
Art Song Literature and History is an advanced study of art song literature from 1800-present for the graduate vocal performance major. Elements of form, style, poetic materials, and performance practice will be covered. Special emphasis will be given to elements of preparation and literature exploration for the emerging performer.

MUL 545  Opera Literature and History  2 cr
Opera Literature and History is designed to provide the student with a comprehensive study of opera from its earliest development to the present day. Elements of form, style, social/political influences, and stagecraft will be explored. Critical analysis of operatic works will be developed through guided listening and viewing assignments.

MUL 546  Collab Piano Lit for Vocal  3 cr
The graduate-level Vocal Accompanying Literature course offers a survey of music composed for voice(s) and piano from the pianist's perspective. Music for solo voice and piano will be explored chronologically. Additional units will feature standard choral music, choral/vocal music for church services, strategies for playing musical theater scores and techniques for operatic score reduction.

MUL 547  Woodwind Literature  3 cr
Woodwind Literature examines solo and chamber woodwind literature. The course will focus on the evolution of woodwind literature and masterworks in the repertoire.

MUL 556  Coll Piano Lit for Instruments  3 cr
Graduate-level Collaborative Piano Literature for keyboard and various instruments is a survey course which seeks to expose students to musical works written for solo instrument and piano/keyboard, standard chamber music (piano trios, quartets and quintets), non-standard chamber music and piano concertos. Collaborative duos will be explored by instrument type (violin, flute, trumpet, etc.), while chamber music will be studied chronologically.

MUL 585  Grad Piano Literature Survey  2 cr
The chronological survey includes units on pre-piano literature from England, France, Germany and Italy, early development of the classical sonata, the Viennese Classical period, late Beethoven and Schubert, the Romantics, Brahms and Nationalism, Debussy and Impressionism, piano music from 1920-1950, piano music since 1950.

MUL 587  Percussion Literature  3 cr
A survey of the major works of solo, concerto and chamber music repertoire for percussion instruments.
MUL 590 Spec Topics in Music History 1 TO 4 cr
A study of works and styles appropriate to the topics listed:
(1) Middle Ages; (2) Renaissance; (3) Baroque Period; (4) Classical Period; (5) Romantic Period; (6) Modern. May be repeated for credit when topics vary.

Music Organization (MUO)

MUO 111 University Concert Choir .5 OR 1 cr
This large ensemble is open to all majors, and performs the masterpieces of choral literature. Required of all voice majors, and a placement audition is required for all participants.

MUO 114 Chamber Singers .5 cr
A small, select ensemble devoted to the performance of vocal chamber music. Audition and instructor permission required.

MUO 115 Chorale .5 OR 1 cr
The Chorale is the preeminent choral ensemble on campus. Chorale members are chosen through special auditions, and perform in area schools and venues to promote the University and the Department of Music.

MUO 116 USA Opera Theatre .5 TO 1 cr
A performing ensemble dedicated to training students in the fundamentals of stage craft, performance, and production through experience with music for the stage. Standards of opera, operetta, and American musical theater are explored in scene exercises and fully-staged productions on and off campus. Enrollment is open to all students through audition or permission of the instructor. Course is cross-listed with DRA 116. Credit cannot be received for both MUO 116 and DRA 116.

MUO 117 University Symphony Band .5 OR 1 cr
A large performing ensemble of woodwind, brass and percussion instrumentalists with an emphasis on wind band literature and live performance. Open to music majors and non-music majors with prior instrumental performance experience in high school or junior college.

MUO 118 Woodwind Ensemble .5 cr
The study and performance of literature for all combinations of woodwind instruments.

MUO 119 Brass Ensemble .5 cr
The study and performance of literature for all combinations of brass instruments.

MUO 120 Percussion Ensemble .5 cr
The study and performance of literature for all combinations of percussion instruments.

MUO 121 Jazz Band .5 cr
The ensemble study of jazz with an emphasis on literature and live performance.

MUO 122 Basketball Pep Band .5 cr
Performs for USA Basketball Games throughout the basketball season. Schedule varies annually.

MUO 123 String Ensemble .5 cr
The study and performance of literature for all combinations of string instruments.

MUO 124 Piano Ensemble .5 cr
The study and performance of two-piano and piano-ensemble literature. Required of piano majors.

MUO 125 Guitar Ensemble .5 cr
The study and performance for ensemble literature for guitar. Required for all guitar majors.

MUO 126 Collegium Musicum .5 cr
A performing ensemble dedicated to combined chamber music experience of both vocal and instrumental forces, playing one-to-a-part, and focusing on music written before 1800. Enrollment is open to the entire university community through audition or permission of the co-directors. By virtue of the terms of the attached constitution, members will learn to choose repertoire, budget and raise small funds, develop programs, reserve performance space, organize print material, and explore the dynamics of team production. This team-taught course will also be dedicated to sharing cultural forces and encouraging the exchange of attitudes shared historically by all people.

MUO 127 Wind Ensemble .5 OR 1 cr
A select performing ensemble of woodwind, brass, and percussion instrumentalists with an emphasis on wind ensemble literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school or junior college. Audition or permission of instructor required for participation.

MUO 129 Mixed Chamber Ensemble .5 cr
The study and performance of chamber literature for all combinations of instruments and voices.

MUO 130 University Marching Band 1 cr
A large performing ensemble of woodwind, brass, percussion instrumentalists, and appropriate auxiliary personnel with an emphasis on live performance for athletic events. Open to music majors and non-music majors with prior instrumental performance experience in high school or junior college.

MUO 131 University Winterguard .5 OR 1 cr
A large performing ensemble consisting of appropriate auxiliary personnel (flags, rifles, sabres, etc.) with an emphasis on live performance.
MUO 133  University Orchestra .5 OR 1 cr
A large performing ensemble of string, woodwind, brass, and percussion instrumentalists with an emphasis on orchestral literature and live performance. Open to music majors and non-music majors with prior instrumental performance experience in high school or junior college. Audition or permission of instructor required for participation.

MUO 136  World Music Ensemble .5 cr
The study and performance of world literature for all combinations of instruments with an emphasis on music from non-Western cultures.

MUO 137  University Band .5 OR 1 cr
A performing ensemble of woodwind, brass, and percussion instrumentalists with an emphasis on concert band literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school, junior college, or at the university level. No audition is required for this ensemble and it is open to the entire campus community as well as faculty and staff.

MUO 138  Flute Choir .5 cr
The study and performance of literature for all combinations of flutes.

MUO 139  Trumpet Ensemble .5 cr
The study and performance of literature for all combinations of trumpets.

MUO 140  Horn Choir .5 cr
The study and performance of literature for all combinations of horns.

MUO 141  Trombone Choir .5 cr
The study and performance of literature for all combinations of trombones.

MUO 142  Tuba-Euphonium Ensemble .5 cr
The study and performance of literature for all combinations of tubas and euphoniums.

MUO 143  Brass Choir .5 cr
The study and performance of literature for large brass ensemble.

MUO 144  USA Steel Band .5 cr
The study and performance of literature for steel band including the traditional styles of soca and calypso music from the Caribbean. Instructor permission required.

MUO 145  Clarinet Ensemble .5 cr
The study and performance of literature for all combinations of clarinets.

MUO 414  Chamber Singers .5 cr
A small, select ensemble devoted to the performance of vocal chamber music. Audition and instructor permission required.

MUO 147  University Symphony Band .5 OR 1 cr
A large performing ensemble of woodwind, brass and percussion instrumentalists with an emphasis on wind band literature and live performance. Open to music majors and non-music majors with prior instrumental performance experience in high school or junior college.

MUO 148  Woodwind Ensemble .5 cr
The study and performance of literature for all combinations of woodwind instruments.

MUO 149  Brass Ensemble .5 cr
The study and performance of literature for all combinations of brass instruments.

MUO 150  Percussion Ensemble .5 cr
The study and performance of literature for all combinations of percussion instruments.

MUO 151  Jazz Band .5 cr
The ensemble study of jazz with an emphasis on literature and live performance.

MUO 152  String Ensemble .5 cr
The study and performance of literature for all combinations of string instruments.

MUO 153  Piano Ensemble .5 cr
The study and performance of two-piano and piano-ensemble literature. Required of piano majors.

MUO 154  Guitar Ensemble .5 cr
The study and performance of ensemble literature for guitar. Required of guitar majors.
MUO 426  Collegium Musicum  .5 cr
A performing ensemble dedicated to combined chamber music experience of both vocal and instrumental forces, playing one-to-a-part, and focusing on music written before 1800. Enrollment is open to the entire university community through audition or permission of the co-directors. By virtue of the terms of the attached constitution, members will learn to choose repertoire, budget and raise small funds, develop programs, reserve performance space, organize print material, and explore the dynamics of team production. This team-taught course will also be dedicated to sharing cultural forces and encouraging the exchange of attitudes shared historically by all people.

MUO 427  Wind Ensemble  .5 OR 1 cr
A select performing ensemble of woodwind, brass and percussion instrumentalists with an emphasis on wind ensemble literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school or junior college. Audition or permission of instructor required for participation.

MUO 429  Mixed Chamber Ensemble  .5 cr
The study and performance of chamber literature for all combinations of instruments and voices.

MUO 430  University Marching Band  1 cr
A large performing ensemble of woodwind, brass, percussion instrumentalists, and appropriate auxiliary personnel with an emphasis on live performance for athletic events. Open to music majors and non-music majors with prior instrumental performances experience in high school or junior college.

MUO 431  University Winterguard  .5 OR 1 cr
A large performing ensemble consisting of appropriate auxiliary personnel (flags, rifles, sabres, etc.) with an emphasis on live performance.

MUO 433  University Orchestra  .5 TO 1 cr
A large performing ensemble of string, woodwind, brass and percussion instrumentalists, with an emphasis on orchestral literature and live performance. Open to music majors and non-music majors with prior instrumental performance experience in high school or junior college. Audition or permission of instructor required for participation.

MUO 436  World Music Ensemble  .5 cr
The study and performance of world literature for all combinations of instruments with an emphasis on music from non-Western cultures.

MUO 437  University Band  .5 OR 1 cr
A performing ensemble of woodwind, brass, and percussion instrumentalists with an emphasis on concert band literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school, junior college, or at the university level. No audition is required for this ensemble and it is open to the entire campus community as well as faculty and staff.

MUO 438  Flute Choir  .5 cr
The study and performance of literature for all combinations of flutes.

MUO 439  Trumpet Ensemble  .5 cr
The study and performance of literature for all combinations of trumpets.

MUO 440  Horn Choir  .5 cr
The study and performance of literature for all combinations of horns.

MUO 441  Trombone Choir  .5 cr
The study and performance of literature for all combinations of trombones.

MUO 442  Tuba-Euphonium Ensemble  .5 cr
The study and performance of literature for all combinations of tubas and euphoniums.

MUO 443  Brass Choir  .5 cr
The study and performance of literature for large brass ensemble.

MUO 444  USA Steel Band  .5 cr
The study and performance of literature for steel band including the traditional styles of soca and calypso music from the Caribbean. Instructor permission required.

MUO 445  Clarinet Ensemble  .5 cr
The Study and performance of literature for all combinations of clarinets.

MUO 507  Ensemble with Coll Keyboard  1 cr
The Director for Collaborative Keyboard studies will meet with the student enrolled in MUO 507 to determine an ensemble assignment. Assignments may include one of the following: accompany/collaborate with Opera Theater, Symphony Band, Wind Ensemble, Concert Choir, Chorale, Chamber Music Ensemble or smaller ensemble.

MUO 511  University Concert Choir  .5 OR 1 cr
This large ensemble is open to all majors, and performs the masterpieces of choral literature. Required for all voice majors, and a placement audition is required for all participants.

MUO 514  Chamber Singers  .5 cr
A small, select ensemble devoted to the performance of vocal chamber music. Audition and instructor permission required.

MUO 515  Chorale  .5 OR 1 cr
The Chorale is the preeminent choral ensemble on campus. Chorale members are chosen through special auditions, and perform in area schools and venues to promote the University and the Department of Music.
MUO 516 Opera & Musical Theatre Wrkshp 1 cr
A performing ensemble dedicated to training students in the fundamentals of stage craft, performance, and production through experience with music for the stage. Standards of opera, operetta, and American musical theatre are explored in scene exercises and fully-staged productions on and off campus. Enrollment is open to all students through audition or permission of the instructor.

MUO 517 University Symphony Band .5 OR 1 cr
A large performing ensemble of woodwind, brass and percussion instrumentalists with an emphasis on wind band literature and live performance. Open to music majors and non-music majors with prior instrumental performance experience in high school or junior college.

MUO 518 Woodwind Ensemble .5 cr
The study and performance of literature for all combinations of woodwind instruments.

MUO 519 Brass Ensemble .5 cr
The study and performance of literature for all combinations of brass instruments.

MUO 520 Percussion Ensemble .5 cr
The study and performance of literature for all combinations of percussion instruments.

MUO 521 Jazz Band .5 cr
The ensemble study of jazz with an emphasis on literature and live performance.

MUO 523 String Ensemble .5 cr
The study and performance of literature for all combinations of string instruments.

MUO 524 Piano Ensemble .5 cr
The study and performance of two-piano and piano-ensemble literature. Required of piano majors.

MUO 525 Guitar Ensemble .5 cr
The study and performance of ensemble literature for guitar. Required of guitar majors.

MUO 526 Collegium Musicum .5 cr
A performing ensemble dedicated to combined chamber music experience of both vocal and instrumental forces, playing one-to-a-part, and focusing on music written before 1800. Enrollment is open to the entire University community through audition or permission of the co-directors. By virtue of the terms of the attached constitution, members will learn to choose repertoire, budget and raise small funds, develop programs, reserve performance space, organize print material, and explore the dynamics of team production. This team-taught course will also be dedicated to sharing cultural forces and encouraging the exchange of attitudes shared historically by all people.

MUO 527 Wind Ensemble 1 cr
A select performing ensemble of woodwind, brass and percussion instrumentalists with an emphasis on wind ensemble literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school or junior college. Audition or permission of instructor required for participation.

MUO 529 Mixed Chamber Ensemble .5 cr
The study and performance of chamber literature for all combinations of instruments and voices.

MUO 530 University Marching Band 1 cr
A large performing ensemble of woodwind, brass, percussion instrumentalists, and appropriate auxiliary personnel with an emphasis on live performance for athletic events. Open to music majors and non-majors with prior instrumental performance experience in high school or junior college.

MUO 531 University Winterguard .5 OR 1 cr
A large performing ensemble consisting of appropriate auxiliary personnel (flags, rifles, sabres, etc.) with an emphasis on live performance.

MUO 533 University Orchestra .5 OR 1 cr
A large performing ensemble of string, woodwind, brass and percussion instrumentalists with an emphasis on orchestral literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school or junior college. Audition or permission of instructor required for participation.

MUO 536 World Music Ensemble .5 cr
The study and performance of world literature for all combinations of instruments with an emphasis on music from non-Western cultures.

MUO 537 University Band .5 OR 1 cr
A performing ensemble of woodwind, brass and percussion instrumentalists with an emphasis on concert band literature and live performance. Open to music majors and non-majors with prior instrumental performance experience in high school, junior college, or at the University level. No audition is required for this ensemble and is open to the entire campus community as well as faculty and staff.

MUO 538 Flute Choir .5 cr
The study of performance of literature for all combinations of flutes.

MUO 539 Trumpet Ensemble .5 cr
The study and performance of literature for all combinations of trumpets.

MUO 540 Horn Choir .5 cr
The study and performance of literature for all combinations of horns.

MUO 541 Trombone Choir .5 cr
The study and performance of literature for all combinations of trombones.
MUO 542 Tuba - Euphonium Ensemble .5 cr
The study and performance of literature for all combinations of tubas and euphoniums.

MUO 543 Brass Choir .5 cr
The study and performance of literature for large brass ensemble.

MUO 544 USA Steel Band .5 cr
The study and performance of literature for steel band including the traditional styles of soca and calypso music from the Caribbean. Instructor permission required.

MUO 545 Clarinet Ensemble .5 cr
The study and performance of literature for all combinations of clarinets.

Music Studio (MUS)

MUS 201 Intro to Music Edu Technology 2 cr
Application of current Music Technology for the N-12 curriculum. Laboratory experience is given in selected software programs appropirate to music education. Pre-requisite: MUT 113 Minimum Grade of C.

MUS 202 Vocal Diction I 1 cr
A lecture/performance course, rooted in the International Phonetic Alphabet (IPA), designed to enable singers to analyze and perform vocal repertoire in English and Italian. Prerequisite: Open to music majors and minors only.

MUS 203 Vocal Diction II 1 cr
A lecture/performance course, rooted in the International Phonetic Alphabet (IPA), designed to enable singers to analyze and perform vocal repertoire in French and German. Pre-requisite: MUS 202 Minimum Grade of D.

MUS 204 Introduction to Music Business 3 cr
A general overview of the music industry is the primary objective of the course. Some emphasis will be placed on career options.

MUS 304 Principles of Music Business I 3 cr
A continuation of MUS 204, 304 will place emphasis on the legal aspects of the music industry. Pre-requisite: MUS 204 Minimum Grade of D.

MUS 305 Principles Music Business II 3 cr
A continuation of MUS 304, 305 will address marketing and promoting in music. Pre-requisite: MUS 304 Minimum Grade of D.

MUS 404 Recording Technology 2 cr
This course provides an overview of analog and digital audio, introduces students to basic recording/mixing tools and topics include: microphone and mixer preparation, studio and computing capture/edit. Also addressed: project management, assets, and project. Pre-requisite: MUT 213 Minimum Grade of C.

MUS 421 Music - Sound and Multimedia 2 cr
This course familiarizes students with the techniques and materials for incorporating sound and music in the Wintel and Macintosh multimedia environments. Topics to be addressed will include making music with and without MIDI, sound resources, special effects, commercial libraries and sounds, digital sequencing, authoring environments, and legal issues.

MUS 422 Sequencing 2 cr
To familiarize students with professional-level music sequencing software, hardware, and techniques. Students will gain practical skills with MIDI recording, playback, and editing.

MUS 470 Internship Music Bus 9 TO 12 cr
Internship is a program that provides qualified university students with supervised experience in production practices, management techniques, research applications, personnel matters, and other activities found in the modern music industry. Prerequisites: Completion of the Music Industry Concentration core including College of Business course requirements, permission of the participating business-organization, and approval of the departmental internship coordinator and department chair.

MUS 490 Special Topics 1 TO 3 cr
This course introduces students to fundamental techniques and materials for working with studio-quality sound, hardware and software. Topics will be drawn from: MIDI/music networks, graphic notation, MIDI controllers/sequencers, sampling basics, and film and video synchronization fundamentals. May be repeated for a maximum of nine credit hours. Pre-requisite: MUS 421 Minimum Grade of D and MUS 422 Minimum Grade of D.

MUS 499 Senior Honors Proj in Music-H 3 TO 6 cr
With the guidance and advice of a faculty mentor, Honors Students will identify, and carry out a research project in music. The outcome of the research project will include a written report and formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three members of the faculty, chaired by the faculty mentor. Requires permission of department chair.

MUS 521 Music - Sound and Multimedia 3 cr
To familiarize students with the techniques and materials for incorporating sound and music in the multimedia environment. Topics to be addressed will include making music with and without MIDI, sound resources, special effects, commercial libraries and sounds, digital sequencing, authoring environments, and legal issues.

MUS 522 Sequencing 2 cr
This course familiarizes students with professional-level music sequencing software, hardware, and techniques. Students will gain practical skills with MIDI recording, playback, and editing. Instructor permission required.
MUS 585  Practicum in Coll Keyboard  2 cr
The Director for Collaborative Keyboard studies will meet
with the student enrolled in MUS 585 to assign literature,
which will be studied during the semester. Assignments
may include several selections with vocalists, as well as
collaboration with strings, woodwinds and brass. The goal
of the course is to gain practical experience as collaborator
studying standard repertoire with a varied group of vocalists
and instrumentalists.

MUS 587  Arranging for Percussions  1 cr
The analysis of existing musical works from various entres
and the ability to create effective musical arrangements
scored only for percussion instruments.

MUS 590  Sp Top in Music Technology  1 TO 3 cr
Special topics in Music Technology. May be repeated for a
maximum of 9 hours.
Pre-requisite: MUS 522 Minimum Grade of D.

Music Theory (MUT)

MUT 112  Basic Music Theory I  3 cr
Integrated course in aural and non-aural music theory
including music skills, part writing analysis, counterpoint,
sight singing, dictation, keyboard harmony, and computer
applications in part writing and ear training.

MUT 113  Basic Music Theory II  3 cr
Elementary part-writing in two, three, and four voices. Sight-
singing, ear-training, and keyboard harmony. Must be taken in
sequence.
Pre-requisite: MUT 112 Minimum Grade of C.

MUT 212  Intermediate Music Theory I  3 cr
A continuation of elementary theory. Chromatic harmony
and remote modulation; sight-singing, ear training, keyboard
harmony. Must be taken in sequence.
Pre-requisite: MUT 113 Minimum Grade of C.

MUT 213  Intermediate Music Theory II  3 cr
A continuation of elementary theory. Chromatic harmony
and remote modulation; sight-singing, ear-training, keyboard
harmony. Must be taken in sequence.
Pre-requisite: MUT 212 Minimum Grade of C.

MUT 312  Integrated Analytical Tech I  2 cr
This is the first semester of a two semester sequence
designed to familiarize students with the rudiments of formal
analysis, counterpoint, and practical orchestration for 18th,
19th, and 20th century music - particularly emphasizing
classical, jazz, pop, and selected world-music styles.
Pre-requisite: MUT 213 Minimum Grade of C.

MUT 313  Integrated Analytical Tech II  2 cr
This is the second semester of a two semester sequence
designed to familiarize students with the rudiments of formal
analysis, counterpoint, and practical orchestration for 18th,
19th, and 20th century musics-particularly emphasizing
classical, jazz, pop, and selected world-music styles.
Pre-requisite: MUT 312 Minimum Grade of C.

MUT 314  Introduction to Composition  2 cr
Compositional techniques and the writing of original
compositions for solo instruments and small ensembles.
Pre-requisite: MUT 213 Minimum Grade of D.

MUT 361  Fundamentals of Conducting  3 cr
Basic baton technique; simple and complex rhythms; score
reading; practical choral and instrumental conducting
techniques.
Pre-requisite: MUT 213 Minimum Grade of D.

MUT 362  Instrumental Conducting  3 cr
Advanced baton technique; psychology of rehearsal;
interpretative and conducting techniques for instrumental
organization.
Pre-requisite: MUT 361 Minimum Grade of D.

MUT 364  Choral Cond and Lit  3 cr
Advanced conducting with attention to the harmonic and
formal analysis of choral works; special emphasis on
performance practice.
Pre-requisite: MUT 361 Minimum Grade of D.

MUT 412  Orchestration  2 cr
The techniques of scoring for the orchestra, band, and small
ensembles.
Pre-requisite: MUT 213 Minimum Grade of D.

MUT 413  Band Arranging  2 cr
The techniques of scoring for the modern concert wind
band. Offered in alternate years.
Pre-requisite: MUT 213 Minimum Grade of D.

MUT 421  Composition I  3 cr
Original work in musical composition. To be taken in
sequence. Offered by special arrangement only.
Pre-requisite: MUT 314 Minimum Grade of D.

MUT 422  Composition II  3 cr
Original work in musical composition. To be taken in
sequence. Offered by special arrangement only.
Pre-requisite: MUT 421 Minimum Grade of D.

MUT 431  Jazz Improvisation I  2 cr
The study of elementary improvisation techniques used
in contemporary jazz performance. Instructor permission
required.

MUT 432  Jazz Improvisation II  2 cr
The study of intermediate to advanced improvisation
techniques used in contemporary jazz performance.
Instructor permission required.
MUT 490  Special Topics -  1 TO 3 cr
Special topics in music theory and composition. May be repeated for a maximum of six hours credit when content varies.

MUT 512  Intro Analysis of Music Lit  4 cr
Introduction to the techniques of analysis applied to a selection of music literature emphasizing works from the seventeenth century to the middle of the twentieth century.

MUT 513  Pedagogy of Theory  1 TO 4 cr
Practices and principles of teaching music theory, emphasizing most desirable and practical offerings possible. A comparative survey of current systems and materials for teaching music theory and aural skills. Review of materials and methods used in teaching the written music theory sequence and in teaching aural skills (music dictation and sight singing). Includes review of textbooks and technology used in the classroom.

MUT 531  Jazz Improvisation I  2 cr
The study of elementary improvisation techniques used in contemporary jazz performance. Instructor permission required.

MUT 532  Jazz Improvisation II  2 cr
The study of intermediate to advanced improvisation techniques used in contemporary jazz performance. Instructor permission required.

Natural Science Education (NSE)

NSE 201  Intro to Physical Science  3 cr
The scientific attitude, the application of physical laws and principles to modern life, and assembling of apparatus and materials for demonstrating these principles are studied. (Not open to science majors.)

NSE 202  Intro to Physical Science  3 cr
The scientific attitude, the application of physical science laws and principles to modern life, and assembling of apparatus and materials for demonstrating these principles are studied. (Not open to science majors.)

NSE 403  Aerospace Education  3 cr
Basic principles of flight; survey of space exploration, military, commercial, and general aviation. Preparation of materials for use in teaching.

NSE 404  Aerospace Education  3 cr

NSE 494  Dir St -  1 TO 3 cr
Directed study. No more than 6 hours can be accepted for a Bachelor’s Degree and Class B Certificate. Prerequisite: Permission of department chair.

NSE 501  Adv Aerospace Education  3 cr

NSE 594  Dir St and Research  1 TO 3 cr
Students explore through directed study problems and issues of special interest or signification in Science Education. No more than 3 hours of any departmental 594 courses can be applied toward a degree program. Prerequisite: Permission of department chair.

Nursing (NU)

NU 101  Freshman Seminar in Nursing  2 cr
The purpose of this course is to introduce the unique requirements and opportunities of professional nursing to beginning students who have declared nursing as their major and are considering nursing as a major. The course focuses on the value of higher education as a base for a career in nursing and develops an awareness of activities and support services available within the University to enhance student success. Academic rules and regulations and policies related to admission, progression, and graduation in the University and College are discussed.
NU 300  Foundations of Prof Nsg  5 cr
The purpose of the course is to provide students the opportunity to appraise theories, concepts, evidence, issues and trends in promoting the health of an adult-geron population experiencing commonly occurring health care needs. Emphasis is on the use of the nursing process and other systematic approaches to assess, plan, implement, and evaluate health promotion and maintenance activities, illness care, and rehabilitation with adults in a variety of acute and community settings.
Co-requisite: NU 301
Pre-requisite: NU 325 Minimum Grade of C and NU 327 Minimum Grade of C and HSC 343 Minimum Grade of C and NU 311 Minimum Grade of C and HSC 342 Minimum Grade of C.

NU 301  Foundations of Prof Nsg Clin  3 cr
Application of concepts and theories related to health promotion and maintenance, illness care, and rehabilitation with an adult-geron population experiencing commonly occurring health care needs. Emphasis is the role of the professional nurse and on the use of the nursing process with an adult-geron population in a variety of acute and community based settings.
Co-requisite: NU 300
Pre-requisite: NU 325 Minimum Grade of C and NU 327 Minimum Grade of C and (HSC 243 Minimum Grade of C or HSC 343 Minimum Grade of C) and NU 311 Minimum Grade of C and HSC 342 Minimum Grade of C.

NU 302  Essentials of Professions Nsg  4 cr
The purpose of this course is to provide an overview of pathophysiology, pharmacology, clinical skills assessment, and medication administration. The course focuses on the responsibility of the professional nurse in ensuring quality and safety.
Pre-requisite: (NU 325 or NU 311 ) and (NU 327 or HSC 343 ). NU 325 and NU 311 and NU 327 and HSC 343 can be taken concurrently with this course.

NU 304  Evidence Based Practice NU- W  3 cr
The purpose of this course is to introduce evidence-based practice (EBP) to the undergraduate nursing student. Emphasis within the course is one evaluation of literature relevant to nursing practice, and the implications of its application to care provided to the patient. Ethical implications of research and EBP, including the roles of clinical expertise, patient values and preferences in EBP are also examined in the course. This course requires professional component standing.
Pre-requisite: NU 300 Minimum Grade of C and NU 301 Minimum Grade of C and EH 101 Minimum Grade of C and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). NU 300 and NU 301 can be taken concurrently with this course.

NU 311  Clinical Nursing Skills  3 cr
The purpose of this course is to provide students the opportunity to acquire basic nursing care skills. The emphasis is on the responsibilities of the professional nurse in ensuring quality and safety. Students are introduced to simulation as an approach to sharpen clinical reasoning and communication skills in a safe environment. Prerequisites: Admission or special permission of instructor.
Co-requisite: NU 325

NU 312  Clinical Skills Immersion  1 cr
Application of concepts and theories related to health promotion and maintenance, illness care, and rehabilitation with an adult-gerontology population experiencing commonly occurring health care needs. Emphasis on the role of the professional nurse and on the use of the nursing process with an adult-gerontology population in a variety of community based settings.
Pre-requisite: NU 325 Minimum Grade of C and NU 311 Minimum Grade of C. NU 325 and NU 311 can be taken concurrently with this course.

NU 325  Health Assessment  3 cr
The purpose of the course is to provide students the opportunity to acquire basic nursing assessment skills. The emphasis is on the assessment skills of the whole person, including physical, psychological, sociocultural, and spiritual aspects of persons from all stages of life. Students will learn skills associated with obtaining a health history and performing health assessments across the lifespan.
Prerequisite: Admission to professional component or special permission of instructor.
Co-requisite: NU 311

NU 327  Patho Basis of Nursing  3 cr
The purpose of the course is to provide students the opportunity to acquire the theory and evidence applicable to the physiology and alterations in physiology of individuals across the lifespan. The emphasis of this course is alterations in cardiovascular, pulmonary, genitourinary, gastrointestinal, immune, neurological, musculoskeletal, and endocrine systems. Prerequisite: Admission to professional component or special permission of instructor.
Pre-requisite: (NU 311 and NU 325 ). NU 311 and NU 325 can be taken concurrently with this course.

NU 332  Clinical Nutrition  2 cr
The purpose of this course is to provide students the opportunity to acquire nutritional theory and evidence required for health promotion and disease prevention of individuals across the lifespan.
Pre-requisite: NU 327 Minimum Grade of C and NU 325 Minimum Grade of C and NU 343 Minimum Grade of C. NU 327 and NU 325 and NU 343 can be taken concurrently with this course.

NU 390  Sp Top -  1 TO 8 cr
Study of a significant topic or problem in Nursing and the Health Professions. This course may be repeated for a total of four credits. Requires special permission.
NU 394 Directed Study - 1 TO 4 cr
Individual study in a nursing area chosen in consultation with instructor. Requires special permission.

NU 395 Study Abroad Cultural Exp 0 TO 9 cr
The purpose of this course for the undergraduate student is to develop an improved understanding of culture, Leininger's theory of Diversity and Universality, to recognize any cultural practices that affect health care, to incorporate this understanding into the provision of care. Culture will be examined through writing, cultural experiences, through collaboration. The course is underpinned by Dr. Leininger's definition of culture and her theory of culture care.

NU 404 EBP & Informatics 3 cr
This course designed for Registered Nurse students to apply principles of research, evidence-based practice (EBP) and informatics to practice problems. The focus of the course is interpreting and incorporating research for the improvement of health care. Assignments relate EBP through practice integrated experiences. Emphasis is on critical appraisal of research and use of data in quality improvement.

NU 410 Concepts of Prof Nursing - W 6 cr
A bridge course for the Registered Nurse student. Focuses on the philosophy of the College of Nursing and selected theories and concepts that are integrated throughout the curriculum. Emphasis is on professional nursing roles and strategies for health promotion and maintenance with individuals, families, and groups. Requires registered nurse licensure and admission to RN to BSN track. Requires special permission.

NU 412 Decision Making & Delegation 4 cr
This course focuses on continuing the leadership development of the student within the context of providing professional nursing care to patients and families across the lifespan. Decision-making, delegation, and motivation competencies are emphasized.
Co-requisite: NU 414, NU 460
Pre-requisite: CMN 420 Minimum Grade of C and CMN 421 Minimum Grade of C and (AHN 330 Minimum Grade of C or AHN 447 Minimum Grade of C and AHN 331 Minimum Grade of C or AHN 448 Minimum Grade of C). CMN 420 and CMN 421 can be taken concurrently with this course.

NU 414 Issues & Trends Health Care -W 3 cr
The purpose of this web based course is to provide students the opportunity to integrate leadership roles and functions, management strategies, current issues and trends affecting nursing and health care and continued professional development, into a personal lifelong learning plan. Emphasis is on the professional nurse as a leader in improving patient care and cost effectiveness of health care and the development of a current nursing workforce. National interest areas such as patient safety, policy, patient centered care, and the process for quality improvement are primary focuses.
Co-requisite: NU 412, NU 460
Pre-requisite: (AHN 447 Minimum Grade of C and AHN 448 Minimum Grade of C and EH 101 Minimum Grade of C) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C). AHN 447 and AHN 448 can be taken concurrently with this course.

NU 415 Seminar in Issues & Trends 3 cr
The purpose of this course is to introduce Registered Nurse students to a comprehensive array of current issues and trends affecting nursing and health care in society. Emphasis is on the development of professional nursing contributions to the healthcare environment. The focus is on comprehending factors affecting policy generation and implementation. Prerequisites: Completion of all non-nursing prerequisites.

NU 422 Healthcare Leadership & Collab 3 cr
The purpose of this course is to continue the professional development of Registered Nurse students through initiation leadership and collaborative roles in healthcare or community settings. The course focuses on professionalism, leadership roles and functions, management strategies, and emerging trends in nursing and health care. The emphasis of the course is on the professional nurse as a leader in improving health care. Activities include a practice integrated experience application of quality improvement process to promote optimal health care delivery.

NU 425 Hlth Assm Across the Lifespan 3 cr
The purpose of the course is to provide Registered Nurse students the opportunity to validate and improve nursing assessment skills. Emphasis is on skill sets necessary for assessment of the whole person, including physical, psychological, sociocultural, and spiritual aspects across the lifespan. The emerging role of genomics as a primary element of health history will be explored. Students will demonstrate practice integrated skills of obtaining a health history, performing physical assessments, and completion of comprehensive health assessments for health promotion and maintenance.
NU 427  Pathophysiology & Genomics  3 cr
The purpose of the course is to provide Registered Nurse students the opportunity to acquire the theory and evidence applicable to the physiology and alterations in physiology of individuals across the lifespan. The emphasis of this course is alterations in cardiovascular, pulmonary, genitourinary, gastrointestinal, immune, neurological, musculoskeletal, and endocrine systems. Special attention is given to emerging evidence regarding genomics and its contribution to understanding of pathophysiology.

NU 460  Practicum  5 cr
Culminating clinical practice course to provide students an in-depth learning experience in a selected area of nursing practice. The leadership, management, and caregiver roles of the professional nurse with patients and their families in a selected area of nursing practice is emphasized. Students are assigned to nurse preceptors and with faculty guidance focus on leadership and management, and application of the nursing process theories, concepts, research, issues and trends in caring for patients in a variety of preceptorship placements in acute and community settings.
Co-requisite: NU 412, NU 414
Pre-requisite: CMN 420 Minimum Grade of C and CMN 421 Minimum Grade of C and AHN 447 Minimum Grade of C and AHN 448 Minimum Grade of C. CMN 420 and CMN 421 can be taken concurrently with this course.

NU 461  Integration Prof Practice - W  4 cr
The purpose of this course is to provide Registered Nurse students the opportunity to integrate professional role characteristics with a capstone practice integrated experience. This in-depth learning activity draws on prior work in evidence-based practice, nursing role development, scientific and humanistic foundations, and collaboration. The focus is on application of principles of leadership to create a substantive activity contributing to healthcare improvement. Emphasis is on implementation and evaluation of an initiative in a selected practice setting addressing a health need or problem.

NU 490  Special Topics  0 TO 9 cr
Study of a significant topic or problem in nursing and the health professions. This course may be repeated for a total of four credits. Requires special permission.

NU 496  Service Abroad Hlth Related EX  0 TO 9 cr
This is a service learning course that will culminate in select communities in the international setting. Emphasis is on providing culturally competent care by providing and immersion experience.
Pre-requisite: AHN 448 Minimum Grade of C. AHN 448 can be taken concurrently with this course.

NU 499  NU Honors Senior Project  1 TO 6 cr
The purpose of the course is to provide students the opportunity to investigate scholarly undergraduate research, service-learning, or study abroad experiences resulting in development of the written honors thesis. Nursing Honors Program. Requires special permission.
Pre-requisite: HON 301 Minimum Grade of D. HON 301 can be taken concurrently with this course.

NU 500  Explore Culture Sexual Assault  2 cr
The purpose of this course is to provide nursing students an in-depth exploration of forensic nursing concepts and principles related to caring for the victim and survivor of sexual violence from a population health care perspective with a cultural emphasis. A spectrum of compassionate care incorporating cultural understanding and respect that is cognizant from assault to post trauma aftermath including life-long sequelae and its prevention is utilized. Prevention and health promotion models of care within the context of transcultural global health priorities are reviewed. Forensic nursing concepts and principles related to caring for the victim of sexual violence from a culturally congruent population healthcare perspective across the lifespan are explored including compassionate continued care post-sexual assault.

NU 502  Sexual Assault Vic Practicum  1 cr
The purpose of this course is to provide nursing students opportunities to apply didactic principles to ensure competency in the care of the sexually traumatized patient with particular emphasis on complex forensic histories involving special populations and challenging treatment situations. Students will conduct forensic interviews, exams, preserve evidence, and determine proper techniques involving patients from diverse cultural backgrounds.
Students will identify, critical analyze, determine follow up, and evaluate patient responses that may include a variety of cultural, economic, and physical challenges.
Pre-requisite: NU 500 Minimum Grade of C.

NU 503  Trauma Care Sexual Assault Vic  2 cr
The purpose of this course is to expand the graduate nursing student's knowledge of trauma, particularly sexual trauma. The focus is on examining ongoing threats to safety among individuals, communities, and witnesses to trauma. The course will facilitate students to create policy initiatives, community service activities, and to become violence prevention advocates. The student will understand NP leadership in collaboration with SART, professional nurse testimony and participation in the legal process to empower victims, decrease revictimization, and ensure social justice and healthcare access to the victim, suspect, witness and communities impacted by sexual violence.
Pre-requisite: NU 500 Minimum Grade of C.
NU 504  Adv Pharm Care Post Assault  2 cr
The purpose of this course is to examine the pharmacological principles and the current treatment modalities of post-sexual assault care. The focus is the selection and monitoring of drug therapy of sexual assault victims throughout the the lifespan and across post trauma disease processes. Motivational patient education and follow-up to incentivize adherence and prevent complications will be explored using the pathology of infectious and communicable disease, psychosocial science, pediatric growth and development, and the legal systems as its framework.
Pre-requisite: NU 500 Minimum Grade of C.

NU 505  Sup Care Comorbid Post Assault  2 cr
The purpose of this course is to increase the graduate student's knowledge of the victim/survivor's response to trauma, particularly sexual trauma. The focus is on examining the behavioral, psychological, and physiologic response of victims/survivors across the lifespan with consideration of gender and socio-cultural factors. The emphasis is on patient centered care and includes a multidisciplinary team approach to developing individualized plans of care to facilitate restorative healing for victims/survivors of sexual trauma.
Pre-requisite: NU 500 Minimum Grade of C.

NU 515  CNS Role I  2 cr
Analysis and evaluation of advanced clinical concepts and the role of nursing in providing evidence based care to facilitate positive health outcomes. The focus of the course is on the role of the CNS in wellness, health promotion and disease prevention, risk assessment and reduction, individual and community screening measures, and alternative health practices across the life span for early adult to the frail elderly.
Pre-requisite: NU 545 Minimum Grade of C and NU 578 Minimum Grade of C and NU 518 Minimum Grade of C and NU 608 Minimum Grade of C. NU 545 and NU 578 and NU 518 and NU 608 can be taken concurrently with this course.

NU 516  CNS Roles II  3 cr
The purpose of this course is to provide a forum for the analysis, synthesis, and application of knowledge required for the CNS role in the management of acute health problems for the early adult to the frail elderly. The course focuses on the CNS's spheres of influence on health care incorporating the perspectives of social justice, fiscal stewardship, client advocacy, and evidence based practice. The emphasis is on maximizing the students' ability to identify problems, manage resources and fiscal outcomes, design and select therapeutic interventions, and evaluate products and devices for use with patients and health team members from diverse cultural and ethnic backgrounds. Potential for contributions and entrepreneurial opportunities within nursing will be addressed.
Co-requisite: AHN 517
Pre-requisite: NU 515 Minimum Grade of C and AHN 516 Minimum Grade of C.

NU 517  CNS Role III  3 cr
The purpose of this course is to provide a forum for the analysis, synthesis, and application of knowledge required for the CNS role in the management of chronic problems as well as management and prevention of exacerbations of chronic health problems. The course focuses on the CNS's spheres of influence on health care incorporating the perspectives of social justice, fiscal stewardship, client advocacy, and evidence based practice. The emphasis is on maximizing the students' ability to identify problems, manage resources and fiscal outcomes, design and select therapeutic interventions, and evaluate products and devices for use with patients and health team members from diverse cultural and ethnic backgrounds. Potential for contributions and entrepreneurial opportunities within nursing will be addressed.
Co-requisite: AHN 518
Pre-requisite: NU 516 Minimum Grade of C and AHN 517 Minimum Grade of C and NU 607 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 610 and NU 613 can be taken concurrently with this course.

NU 518  Adv Nursing Assessment  3 cr
This course is designed to further develop the student's advanced knowledge and skills for obtaining and recording a systematic health history and advanced physical examination of individuals and families across the lifespan. The course involves synthesis and application of nursing, biologic, psychologic, and socio-cultural knowledge and theories in comprehensive health assessment for the purposes of health promotion, differential diagnosis, and development of health records. The central objective is the development of cognitive and clinical skills needed to provide comprehensive care to individuals of all ages in primary, secondary, and tertiary care settings.

NU 530  Bridge Adv Health Assessment  4 cr
This course is a bridge course for the RN-BSN/MSN track. This course is designed to develop the student's advanced knowledge and skills for obtaining and recording a systematic health history and advanced physical examination of individuals and families across the lifespan. The course involves synthesis and application of nursing, biologic, psychologic, and sociocultural knowledge and theories in comprehensive health assessment for the purposes of health promotion, differential diagnosis, and development of health records. The central objective is the development of cognitive and clinical skills needed to provide comprehensive care to individuals of all ages in primary, secondary, and tertiary care settings.
NU 531  Bridge Adv Pathophysiology  4 cr  
Bridge course for the accelerated track. Focuses on pathophysiology and cellular physiology theory and research of the cardiovascular, pulmonary, genitourinary, gastrointestinal, immune, neurological, integumentary, musculoskeletal, and endocrine systems. This course provides students with a foundation for providing nursing care to persons having acute, chronic and long-term health care problems.

NU 532  Accel Adv Pharmacology  4 cr  
Bridge course for accelerated track. Advanced clinical application of drug therapy and concepts relating to the mechanisms of drug actions, interactions, and adverse reactions, including immunologic-idiosyncratic-allergic drug responses. Emphasis on pharmacokinetics, cultural/ethnic considerations, dosage, methods of administration, and adverse effects according to major classifications. Current research in pharmacology is also incorporated in course content.

NU 533  Acc MSN Adv Research in Nsg  4 cr  
Bridge course for Accelerated MSN track. Evaluation of methods, designs, issues in nursing research; methods for critiquing research, data analysis methods, ethical and legal implications. Emphasis is on the importance of research and evidenced-based practice to nursing. Development of critical consumers of research and participants in the research process.
Pre-requisite: CMN 350 Minimum Grade of C and CMN 351 Minimum Grade of C.

NU 534  Acc MSN Adv Nsg Roles & Ldshp  4 cr  
Bridge course for Accelerated MSN track. Socialization process of students as professional nurses, leadership roles and functions, management strategies, continued professional development, and issues and trends in nursing and health care, analysis of selected advanced nursing roles, frameworks which provide the basis for specialization and expansion of roles for advanced nursing practice.
Pre-requisite: CMN 420 Minimum Grade of C and CMN 421 Minimum Grade of C and (AHN 330 Minimum Grade of C or AHN 447 Minimum Grade of C) and (AHN 331 Minimum Grade of C or AHN 448 Minimum Grade of C). CMN 420 and CMN 421 can be taken concurrently with this course.

NU 535  Clin Ldr Role & Competencies  3 cr  
The purpose of this course is to explore the role and function of the clinical nurse leader. The course focuses on the implementation of the role which will vary across settings and facilities. The emphasis is on evidenced-based practice and knowledge and skills that the CNL role requires for successful enactment of the role.
Co-requisite: NU 536
Pre-requisite: NU 607 Minimum Grade of C and NU 518 Minimum Grade of C and NU 545 Minimum Grade of C and NU 578 Minimum Grade of C. NU 518 and NU 545 and NU 578 can be taken concurrently with this course.

NU 536  Clin Nurse Ldr Pract I  5 cr  
The purpose of this first of two capstone Clinical Nurse Leader courses is to provide students an in-depth preceptor-based clinical experience in a selected area of nursing practice. The focus of the course is on the CNL as caregiver, leader, and care manager. Emphasis is on the application of the nursing process, theories, concepts, research, issues and trends in providing care in complex patient situations and managing the care of a group of patients.
Co-requisite: NU 535
Pre-requisite: NU 607 Minimum Grade of C.

NU 537  Clin Nurse Leader Synthesis  3 cr  
The purpose of this culminating synthesis course for the CNL role is provide students an opportunity to analyze and evaluate actual CNL practice patterns. The course focuses on continuing to build the students competencies in clinical decision making, problem identification, resource management, and outcome measurement for a selected patient population at the point of care. The emphasis is on working with patients and health team members from diverse cultural and ethnic background, accountability for coordination, delegation and supervision of care within a multidisciplinary team.
Co-requisite: NU 538
Pre-requisite: (NU 535 Minimum Grade of C and NU 536 Minimum Grade of C) and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 607 Minimum Grade of C.

NU 538  Clinical Nnrse Ldr Prac II  4 cr  
The purpose of this second of two capstone Clinical Nurse Leader courses is to provide students an immersion experience in the CNL role in a selected area of nursing practice. The focus of the course is to further develop CNL competencies with emphasis on team leading and building, advocacy, communication, resource and outcomes management, and evidenced based practice.
Co-requisite: NU 537
Pre-requisite: NU 535 Minimum Grade of C and NU 536 Minimum Grade of C.

NU 539  Intro to Nursing Informatics  3 cr  
The purpose of this course is to provide the student an introduction to nursing informatics and the evolving importance of the application and evaluation of information technology in nursing and health care. The emphasis of the course is to provide the students the expertise and knowledge to function effectively in the modern health care information technology (IT) environment.

NU 545  Physio-Patho Basis of Adv Nsg  3 cr  
The purpose of this course is to provide the advanced practice nurse with knowledge of normal physiology and alterations in physiology in individuals across the life span. The focus is theory and research applicable to organ systems and cellular events. Emphasis is on regulatory and compensatory functions in health and in pathophysiological conditions.
NU 556  Informatics & Qual Care Improv  3 cr
The purpose of this course is to focus on quality improvement models and methods which will use client outcome measures across a broad range of health care settings. Emphasis will be placed on Continuous Quality Improvement (CQI) methods and their relationships with current health care systems.
Co-requisite: NU 557
Pre-requisite: ISC 555 Minimum Grade of C and NU 565 Minimum Grade of C and NU 539 Minimum Grade of C and ISC 550 Minimum Grade of C and NU 562 Minimum Grade of C. NU 565 and NU 539 and ISC 550 can be taken concurrently with this course.

NU 557  Clinical Informatics Pract I  2 cr
This clinical course allows students to integrate concepts and theories in clinical informatics in selected health care settings. This practicum offers students an opportunity to work closely with a health care vendor and integrate concepts/theories in clinical informatics. Additionally students will begin to learn how to configure and customize operating systems. Students will also begin to identify their site for Clinical Informatics Practicum II.
Co-requisite: NU 556

NU 558  Seminar in Nursing Informatics  3 cr
This course will provide students the opportunity to discover the responsibilities of the Nursing Informatics Specialist's role by applying legal/ethical concepts to selected case studies in a variety of situations.
Co-requisite: NU 559
Pre-requisite: NU 607 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 608 Minimum Grade of C. NU 607 and NU 610 and NU 613 and NU 608 can be taken concurrently with this course.

NU 559  Clinical Informatics Pract II  2 cr
This clinical course allows students to integrate and apply informatics competencies in the nurse informatics specialty role while working closely with a guided preceptor. This role may take place within a variety of health care settings.
Co-requisite: NU 558

NU 560  Adm & Mgt for Adv Nsg Practice  3 cr
The purpose of this course is to examine concepts and methods of nursing administration. The focus is on management of physical, financial, and human resources in dynamic healthcare systems.
Pre-requisite: NU 607 Minimum Grade of C and NU 613 Minimum Grade of C. NU 607 and NU 613 can be taken concurrently with this course.

NU 561  Nursing Admin Concepts-Theory  3 cr
The purpose of this course is to introduce the role of the nurse executive. The course focuses on role expectations and professional competency requirements. Emphasis within the course is placed on the influential role of the nurse executive in improving patient care, improving health of populations, and reducing healthcare costs.
Co-requisite: NU 566

NU 562  Admin Concepts & Res Mgt FS  3 cr
The purpose of this course is to examine concepts and methods of administration applying these concepts and methods in supervised field activities. The focus is identification of health goals and management of physical, financial, and human resources in healthcare systems. Emphasis is on organizational leadership, interdisciplinary team functioning, and political collaboration to meet health care needs of vulnerable populations in culturally diverse communities.
Pre-requisite: NU 607 Minimum Grade of C. NU 607 can be taken concurrently with this course.

NU 563  Exec Admin Clin Progression  1 TO 4 cr
The purpose of this progression practicum is to facilitate student independence in the Executive Nurse Administrator role. The focus is on the application and synthesis of knowledge and skills acquired in all previous courses and to develop the necessary skills to progress to the next level of competency in the Executive Nurse Administrator role.

NU 565  Nursing Administration Finance  3 cr
The purpose of this course is to introduce nurse administrators to healthcare financial management. The course focuses on reimbursement and expenditures for healthcare delivery. Emphasis within the course is placed on basic accounting, financial decision-making, statement analysis, & staffing plans.
Pre-requisite: NU 607 Minimum Grade of C. NU 607 can be taken concurrently with this course.

NU 566  Nursing Admin Field Study  4 cr
The purpose of this first practicum course is to provide the nurse executive student a faculty and preceptor facilitated clinical experience in a healthcare setting. The course focuses on the professional role and competencies of the nurse executive. Emphasis within the course is placed on the application and synthesis of knowledge and skills acquired in previous courses.
Co-requisite: NU 561
Pre-requisite: NU 565 Minimum Grade of C and NU 562 Minimum Grade of C and HSC 571 Minimum Grade of C.

NU 567  Nursing Admin Internship  3 cr
The purpose of this culminating practicum course is to focus on quality improvement models and methods which will use client outcome measures across a broad range of health care settings. Emphasis will be placed on Continuous Quality Improvement (CQI) methods and their relationships with current health care systems.
Co-requisite: NU 557
Pre-requisite: ISC 555 Minimum Grade of C and NU 565 Minimum Grade of C and NU 539 Minimum Grade of C and ISC 550 Minimum Grade of C and NU 562 Minimum Grade of C. NU 565 and NU 539 and ISC 550 can be taken concurrently with this course.
NU 568 Nursing Admin Seminar 3 cr
The purpose of this course is to prepare students for the role of nurse executive. The course focuses on professional competency development. Emphasis within the course is placed on strategic planning, governance, regulations, politics, and current issues trend.
Co-requisite: NU 567
Pre-requisite: NU 539 Minimum Grade of C.

NU 569 Executive Admin Nsg Intensive 1 cr
The purpose of this course is to provide opportunity for the Executive Administration Nursing student to gain experience in an executive nursing setting prior to entering executive administration nursing specialty specific courses.

NU 570 Emergency NP I 2 cr
This course is the first course in a series of four didactic courses for the Emergency Nurse Practitioner student. The purpose of this didactic course is to prepare Emergency Nurse Practitioner students to assess, diagnose, and manage the health care needs of patients across the lifespan in emergent, urgent, and ambulatory care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential as a basis of care management; (2) treatment of acute health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus is on the advanced practice nursing role in caring for individuals in the emergency care setting with dermatologic, abdominal, and non-traumatic musculoskeletal disorders.
Co-requisite: NU 571

NU 571 Emergency NP Practicum I 1 TO 3 cr
This course is the second course in a series of four didactic courses for the Emergency Nurse Practitioner student that will provide intensive study into clinical specialty. The purpose of this clinical course is to provide the Emergency Nurse Practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in advanced emergency nursing is expected throughout the four clinical courses. The focus is on advanced practice nursing role in caring for individuals of all ages in the emergency care setting.
Co-requisite: NU 570

NU 572 Emergency NP II 2 cr
This course is the second course in a series of four didactic courses for the Emergency Nurse Practitioner student. The purpose of the didactic courses is to prepare Emergency Nurse Practitioner students to assess, diagnose, and manage the health care needs of patients across lifespan in emergent, urgent, ambulatory care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in acute health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus is on the advanced practice nursing role in caring for individuals in the emergency care setting with dermatologic, abdominal, and non-traumatic musculoskeletal disorders.
Co-requisite: NU 573

NU 573 Emergency NP Practicum II 1 TO 3 cr
This course is the second course in a series of three practicum courses for the Emergency Nurse Practitioner student that will provide intensive study into clinical specialty. The purpose of the practicum course is to provide the Emergency Nurse Practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in advanced emergency nursing is expected throughout the four clinical courses. The focus is on advanced practice nursing role in caring for individuals of all ages in the emergency care setting.
Co-requisite: NU 572
Pre-requisite: NU 570 Minimum Grade of C and NU 571 Minimum Grade of C.

NU 574 Emergency NP III 2 cr
This course is the third course in a series of four didactic courses for the Emergency Nurse Practitioner student. The purpose of the didactic course is to prepare Emergency Nurse Practitioner students to assess, diagnose, and manage the health care needs of patients across the lifespan in emergent, urgent, ambulatory care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential diagnosis as a basis for care management; (2) the treatment of acute health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus is on the advanced practice nursing role in caring for individuals in the emergency care setting with renal, genitourinary, endocrine, nervous, and head, eye, ear, nose, and throat system disorders.
Co-requisite: NU 575
Pre-requisite: NU 570 Minimum Grade of C and NU 571 Minimum Grade of C and NU 572 Minimum Grade of C and NU 573 Minimum Grade of C.
NU 575  Emergency NP Practicum III  1 TO 3 cr
This course is the third course in a series of four practicum courses for the Emergency Nurse Practitioner student that will provide intensive study into clinical specialty. The purpose of this practicum course is to provide the Emergency Nurse Practitioner student the opportunity to apply and integrate knowledge acquired thorough coursework. Development and refinement of clinical expertise in advanced emergency nursing is expected throughout the four clinical courses. The focus is on advanced practice nursing role in caring for individuals of all ages in the emergency care setting.
Co-requisite: NU 574
Pre-requisite: NU 570 Minimum Grade of C and NU 571 Minimum Grade of C and NU 573 Minimum Grade of C.

NU 576  Emergency NP IV  2 cr
This course is the final course in a series of four didactic courses for the Emergency Nurse Practitioner student. The purpose of the didactic courses is to prepare Emergency Nurse Practitioner students to assess, diagnose, and manage the health care needs of patients across the lifespan in emergent, urgent, ambulatory care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential diagnosis as a basis for care management; (2) the treatment of acute health problems across the lifespan based on current evidence based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus is on advanced practice nursing role in caring for individuals in the emergency care setting with traumatic and psychiatric disorders.
Co-requisite: NU 577

NU 577  Emergency NP Practicum IV  1 TO 3 cr
This course is the final course in a series of four practicum courses for the Emergency Nurse Practitioner student that will provide intensive study into clinical specialty. The purpose of this practicum course is to provide the Emergency Nurse Practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in advanced emergency nursing is expected throughout the four clinical courses. The focus is on the advanced practice nursing role in caring for individuals of all ages in the emergency care setting.
Co-requisite: NU 576

NU 578  Pharm Adv Practice Nurses  3 cr
The purpose of this course is to expand the pharmacological knowledge of the advanced practice nurse. The focus is the selection and monitoring of drug therapy for persons throughout the lifespan. Emphasis is on pharmacokinetics and pharmacotherapeutics of major drug classifications.
Pre-requisite: NU 545 Minimum Grade of C. NU 545 can be taken concurrently with this course.

NU 579  Family/Emerg Nursing Intensive  1 cr
This course is a clinical practice course for the registered nurse to gain experience providing emergency care to patients across the lifespan. The focus of the course is on application of theories, concepts, research, and issues in emergency nursing. The emphasis is on the role of the professional nurse in emergency nursing and on the use of the nursing process to provide emergency care for individuals across the lifespan that are experiencing an emergency medical condition.

NU 580  Hlth Promo & Ds Prev/FNP/ENP  2 cr
The purpose of this course is to prepare the emergency nurse practitioner student to identify and implement appropriate and culturally competent health promotion and disease prevention strategies across the lifespan. The focus is on the advanced practice nursing of individuals and families in primary and emergency care settings. Emphasis is placed on health promotion and disease prevention with strategic planning at the primary, secondary and tertiary levels of prevention. Various issues are explored pertinent to the advanced practice nurse role.

NU 581  Family/Emergency NP I  5 cr
This course is the first course in a series of four didactic courses for the emergency nurse practitioner student. The purpose of this didactic course is to prepare emergency nurse practitioner students to assess, diagnose, and manage the health care needs of patients across the lifespan in emergent, urgent, and primary care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential diagnosis as a basis for care management; (2) the treatment of acute health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus of this course is on the advanced practice nursing role in caring for individuals in the primary and emergency care setting with disorders of selected body systems.
Co-requisite: NU 582

NU 582  Family/Emerg NP Practicum I  2 cr
This course is the first course in a series of four practicum courses for the emergency nurse practitioner student that will provide intensive study into the family nurse practitioner role and the emergency nurse practitioner specialty. The purpose of this practicum course is to provide the emergency nurse practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in primary and emergency care is expected throughout the four clinical courses.
Co-requisite: NU 581
NU 583  Family/Emergency NP II   5 cr
This course is the second course in a series of four didactic courses where the Emergency Nurse Practitioner student will continue to develop and define assessment, diagnostic, and management skills needed to care for patients across the lifespan in emergent, urgent, and primary care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential diagnosis as a basis for care management; (2) the treatment of acute and chronic health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus of this course is on the advanced practice nursing role in caring for individuals in the primary and emergency care setting with disorders of selected body systems.
Co-requisite: NU 584
Pre-requisite: NU 581 Minimum Grade of C and NU 582 Minimum Grade of C.

NU 584  Family/Emerg NP Practicum II  4 cr
This course is the second course in a series of four practicum courses for the emergency nurse practitioner student that will provide intensive study into the family nurse practitioner role and the emergency nurse practitioner specialty. The purpose of this practicum course is to provide the emergency nurse practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in primary and emergency care is expected throughout the four clinical courses.
Co-requisite: NU 585
Pre-requisite: NU 581 Minimum Grade of C and NU 582 Minimum Grade of C.

NU 585  Family/Emergency NP III  5 cr
This course is the third course in a series of four didactic courses where the emergency nurse practitioner student will continue to develop and define assessment, diagnostic, and management skills needed to care for patients across the lifespan in emergent, urgent, and primary care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential diagnosis as a basis for care management; (2) the treatment of acute and chronic health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus of this course is on the advanced practice nursing role in caring for individuals in the primary and emergency care setting with disorders of selected body systems.
Co-requisite: NU 586
Pre-requisite: (NU 583 Minimum Grade of C and NU 584 Minimum Grade of C).

NU 586  Family/Emerg NP Practicum III  4 cr
This course is the third course in a series of four practicum courses for the emergency nurse practitioner student that will provide intensive study into the family nurse practitioner role and the emergency nurse practitioner specialty. The purpose of this practicum course is to provide the emergency nurse practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in primary and emergency care is expected throughout the four clinical courses.
Co-requisite: NU 585
Pre-requisite: (NU 583 Minimum Grade of C and NU 584 Minimum Grade of C).

NU 587  Family/Emergency NP IV  5 cr
This course is the final course in a series of four didactic courses where the Emergency Nurse Practitioner student will continue to develop and define assessment, diagnostic, and management skills needed to care for patients across the lifespan in emergent, urgent, and primary care settings. Emphasis is placed on (1) synthesis and application of critical thinking, diagnostic reasoning, and scientific knowledge in the development of differential diagnosis as a basis for care management; (2) treatment of acute and chronic health problems across the lifespan based on current evidence-based practice; and (3) collaboration and communication among health care providers in a culturally diverse environment. The focus of this course is on the advanced practice nursing role in caring for individuals in the primary and emergency care setting with disorders of selected body systems.
Co-requisite: NU 588
Pre-requisite: NU 585 Minimum Grade of C and NU 586 Minimum Grade of C.

NU 588  Family/Emerg NP Practicum IV  4 cr
This course is the final course in a series of four practicum courses for the emergency nurse practitioner student that will provide intensive study into the family nurse practitioner role and the emergency nurse practitioner specialty. The purpose of this practicum course is to provide the emergency nurse practitioner student the opportunity to apply and integrate knowledge acquired through coursework. Development and refinement of clinical expertise in primary and emergency care is expected throughout the four clinical courses.
Co-requisite: NU 587
Pre-requisite: NU 585 Minimum Grade of C and NU 586 Minimum Grade of C.
NU 613 Organizational & Sys Leadrshp 3 cr
The purpose of this course for the MSN/DNP student is to synthesize leadership and organizational theory within the context of complex healthcare systems. The course focuses on the exploration and application of principles of advanced communication, collaboration, and team building to the process of systems change to prepare the student for advanced roles in leading change. Emphasis within the course is placed on assessment of organizational culture as a basis for improvement of individual and aggregate healthcare outcomes; models of quality improvement and project planning, implementation, and evaluation are also examined.

NU 615 Qual Improv & Outcomes Assmnt 3 cr
The purpose of this course is to build on the foundation established in NU 608 Evidence Based Practice and Quality Improvement in Healthcare Systems to provide the DNP student with additional knowledge and skills to develop, implement, and evaluate programs that improve health outcomes. The course focuses on the design, implementation, and evaluation of quality improvement methodologies. The course places emphasis on applying quality improvement processes to evaluate outcomes of practice against national benchmarks to determine variances in practice outcomes and population trends. Pre-requisite: NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 611 Minimum Grade of C. NU 607 and NU 608 and NU 611 can be taken concurrently with this course.

NU 616 Data & Dec Mkng Hlth Care Sys 3 cr
The purpose of this course is to prepare the DNP student to be proficient in the evaluation and use of technology and information systems appropriate to specialized areas of advanced nursing practice. The course focuses on information systems and current technology in the management of healthcare outcomes. Within the course, emphasis is placed on the use of information systems and technology based resources to support clinical and administrative decision making.

NU 620 Prin Teach/Learn/Assess Nu Ed 3 cr
The purpose of this course is to provide a foundation of principles of teaching and learning, including theories, styles, and application to the diverse learner. Emphasis is on analysis of teaching in the classroom and clinical setting, assessment techniques, and implementation of technology, all while incorporating evidence-based teaching practices.

NU 656 Nursing Informatics PP&D 3 cr
This course assists the Nursing Informatics DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the Nursing Informatics students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination. Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

NU 622 Current Topics in Nu Education 2 cr
The purpose of this course is to engage the student in an analysis of concepts and theories basic to the nurse educator role in academic and in practice settings. Emphasis is on current issues and trends in nursing education, the role of the academic nurse educator, and professional, social, political, legal, cultural, and other issues related to nursing education.

NU 623 Nsg Educ Synthesis Practicum 3 cr
The purpose of this course is the synthesis of nursing education theory in practicum experience. Focus is on the application of nursing education theory in developing, teaching, and evaluating an education unit, exemplifying the nurse educator role, and adhering to institutional and legal guidelines. Pre-requisite: NU 620 Minimum Grade of C and NU 621 Minimum Grade of C and NU 622 Minimum Grade of C. NU 622 can be taken concurrently with this course.

NU 624 Nursing Informatic Residency I 3 TO 6 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The Nursing Informatics student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the Nursing Informatics student will work with the primary faculty advisor to complete projects and advance their selected practice area. The Nursing Informatics student will have access to and authority for expanded scope of practice to master the DNP competences. Residency sites will depend upon the Nursing Informatics student's career trajectory and approval by collaborating faculty. During the residency semester, student must participate in scheduled scholarly seminars online. Pre-requisite: NU 656 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.
NU 658  NU Informatics Residency II  3 TO 6 cr
Provides Nursing Informatics students the opportunity to fully express all DNP competencies. The Nursing Informatics student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: NU 657 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

NU 659  NU Informatics Residency III  3 TO 6 cr
Final course in residency series as Nursing Informatics student continues to implement and evaluate project plan. Provides Nursing Informatics student the opportunity to fully express all DNP competencies. The Nursing Informatics student, guided by the core faculty and advisor completes quality improvement evidence-based system's change project.
Pre-requisite: NU 612 Minimum Grade of C and NU 658 Minimum Grade of C. NU 612 can be taken concurrently with this course.

NU 661  Executive Nsg Admin PP&D  3 cr
This course assists the Nurse Executive Administration DNP student to learn the processes embedded in developing a doctoral synthesis project. The course will address all aspects of project planning and development as a preliminary step to the Nurse Executive Administration students' selection of a topic or phenomenon of interest for the project and will incorporate well-built questions, search strategies and outcomes, identification of resources needed, plan for evaluation and dissemination.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

NU 662  Nurse Exec Admin Res I  3 TO 6 cr
Theories of leadership, motivation, power, and change are used to influence change in health care organizations. This course will implement evidence-based clinical models and evaluate their effectiveness in health outcomes. The Nurse Executive Administration student will synthesize, critique, and apply evidence to support quality clinical or organizational practices. In this mentored and supervised experience, the Nurse Executive Administration student will work with the primary faculty advisor to complete projects and advance their selected practice area. The Nurse Executive Administration student will have access to and authority for expanded scope of practice to master the DNP competencies. Residency sites will depend upon the student's career trajectory and approval by collaborating faculty. During the residency semester, the Nurse Executive Administration student must participate in scheduled scholarly seminars online. Clinical hours of direct practice/management is required.
Pre-requisite: NU 661 Minimum Grade of S and NU 615 Minimum Grade of C. NU 615 can be taken concurrently with this course.

NU 663  Nurse Exec Admin Res II  3 TO 6 cr
Provides Nurse Executive Administration students the opportunity to fully express all DNP competencies. The student, guided by the faculty facilitator, will implement the scholarly doctoral system's change project.
Pre-requisite: NU 662 Minimum Grade of C and NU 616 Minimum Grade of C. NU 616 can be taken concurrently with this course.

NU 664  Nurse Exec Admin Res III  3 TO 6 cr
Final course in residency series as the Nurse Executive Administration student continues to implement and evaluate project plan. Provides the Nurse Executive Administration student the opportunity to fully express all DNP competencies. The student, guided by the core faculty and advisor, completes quality improvement evidence-based system's change project.
Pre-requisite: NU 663 Minimum Grade of C and NU 612 Minimum Grade of C. NU 612 can be taken concurrently with this course.

NU 668  Family/Emerg NP PP&D  3 cr
In this course, students will begin a systematic investigation of a clinically based topic relevant to the practice of the emergency nurse practitioner. Integration of scientific underpinnings, human caring values, ethical principles, and cultural competencies is expected. Emphasis is placed on developing a proposal for the Doctor of Nursing Practice scholarly project. Students will select and analyze strategies, models, and theories to plan, implement, and evaluate the scholarly project.
Pre-requisite: (NU 607 Minimum Grade of C and NU 608 Minimum Grade of C and NU 610 Minimum Grade of C and NU 613 Minimum Grade of C and NU 611 Minimum Grade of C). NU 611 can be taken concurrently with this course.

NU 669  Family/Emerg NP Residency I  3 cr
This course is the first course in a progressive sequence of three residency courses that will develop the Emergency Nurse Practitioner student into a practice scholar. The purpose of the residency course is to integrate the application of leadership, theoretical, and specialty knowledge to improve patient and population health outcomes in the emergency care setting. The focus of this residency course is to provide the Emergency Nurse Practitioner student with faculty supervised and preceptor mentored experiences to begin the development and implementation of the Doctor of Nursing Practice scholarly project.
Pre-requisite: NU 668 Minimum Grade of S.
NU 682  Family/Emerg NP Residency II  3 cr
This course is the second course in a progressive sequence of three residency courses that will develop the Emergency Nurse Practitioner student into a practice scholar. The purpose of the residency course is to integrate the application of leadership, theoretical, and specialty knowledge to improve patient and population health outcomes in the emergency care setting. The focus of this residency course is to provide the Emergency Nurse Practitioner student with faculty supervised and preceptor mentored experiences to implement the Doctor of Nursing Practice scholarly project.
Pre-requisite: NU 681 Minimum Grade of C.

NU 683  Family/Emerg NP Residency III  3 cr
This course is the final course in a progressive sequence of three residency courses that will develop the Emergency Nurse Practitioner student into a practice scholar. The purpose of the residency course is to integrate the application of leadership, theoretical, and specialty knowledge to improve patient and population health outcomes in the emergency care setting. The focus of this residency course is to provide the Emergency Nurse Practitioner student with faculty supervised and preceptor mentored experiences to evaluate the effectiveness of and disseminate the findings of the Doctor of Nursing Practice scholarly project.
Pre-requisite: NU 682 Minimum Grade of C.

NU 690  Sp Top -  1 TO 9 cr
Selected topics in Nursing Science and/or Nursing Education. Requires special permission.

NU 692  DNP Project Progression  3 cr
Students will register for this course to complete residency course work under the supervision of faculty. Students must remain continuously enrolled until all residency requirements are completed.

NU 694  Directed Study and Research  1 TO 6 cr
Directed study and research facilitated by a member of the graduate faculty. Requires special permission.

Occupational Therapy (OT)

OT 201  Intro to Occupational Therapy  3 cr
An introduction to the occupational therapy profession and the scope of occupational therapy practice. Includes self assessment and development strategies to enhance students’ readiness for the professional component of the occupational therapy curriculum. Familiarizes students with the functions, policies and services of the University, College and Department and includes an exploration of related allied health professions.

OT 499  Senior Honors Project - H - W  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project relevant to the field of Occupational Therapy study that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty members chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to 6 credit hours.

OT 500  Occupation in Context  3 cr
An in depth study of human occupation in context with emphasis on analysis of the person, the environment, and the task utilizing official occupational therapy documents. Includes an introduction to the evidence-based occupational science literature and discussion of the impact of occupation on health an wellbeing.

OT 501  Occupational Development  4 cr
This course will include the study of typical human development throughout the life span with emphasis on best practice screening and assessment, theories of development, and normative and non-normative influences on development.

OT 502  Occupational Development I  3 cr
Study of human occupational development, including developmentally appropriate roles, tasks and activities. Covers prenatal period through adolescence. Emphasis is on normal human development, with some consideration of abnormal development.

OT 503  History and Philosophy of OT  3 cr
Explores the history and development of occupational therapy within the context of national and international events. Philosophies inherent to the field will be explored with an overview of the life span approach to "occupation". Includes discussion of official documents guiding the profession and legislative changes affecting the current and future practice of the profession. Students will be required to learn terminology utilized by occupational therapists and demonstrate a beginning awareness of occupational performance analysis.

OT 504  Neurosci Basis of Occ Perform  3 cr
Study of the neural development, chemistry, structure, function and pathology of the nervous system. Emphasizes the application of basic science knowledge as it relates to human occupational performance.

OT 505  Scientific Inquiry I  2 cr
An introduction to qualitative and quantitative research concepts and statistical methods with emphasis on evidence-based practice and outcomes research. Includes library search strategies, critical analysis of scientific literature, application of statistical methods and research designs, and scientific writing skills.
OT 506  Research Design  1 cr
An introduction to writing a research design proposal. Students will work in small groups and be mentored by faculty to complete a research proposal.

OT 507  ADL/IADL Eval & Intervention  2 cr
Occupational therapy best practice assessment and evidence-based interventions to improve participation in ADL/IADL skills in children and adolescence.

OT 508  Experiential Learning-Peds  2 cr
This course will consist of experiential learning activities focused on occupational therapy evaluation and interventions for ADL and IADL participation in children and adolescence.

OT 509  OT Foundations  3 cr
This course will promote student knowledge of the theories, frames of reference, historical and sociopolitical influences, and professional documents guiding the profession of occupational therapy. Active participation in OT professional organizations will be encouraged.

OT 510  Theoretical Found of OT  3 cr
Introduction to the prevalent theories and fundamental concepts guiding occupational therapy. Includes similarities and differences among major theories. Emphasizes application of these theories to professional practice in occupational therapy.

OT 511  Neuromusculoskeletal Assesmen  1 cr
This course is a study of the structure and function of human body in order to enhance foundational knowledge for evaluation of occupational performance. Instruction include an emphasis on biomechanical assessment of limb range of motion and manual muscle testing.

OT 512  Occupational Development II  3 cr
Study of human occupational development, including developmentally appropriate roles, tasks and activities of young adulthood through senescence and death. Emphasis is on normal human development, with some consideration of abnormal development.

OT 513  Neuromusculoskeletal Experient  2 cr
This course will provide experiential learning of the structure and function of the human body and assessment of limb range of motion and muscle strength. Students will learn to administer assessments of client factors using appropriate and safe procedures and protocols.

OT 515  Psychosocial Eval & Intervent  3 cr
This course will promote OT best practice evaluation and evidence-based psychosocial interventions for individual and groups to promote occupational performance in various environments.

OT 517  Occupational Evaluation I  3 cr
An overview of the evaluation process in occupational therapy. Includes the theoretical basis of evaluation, selection of appropriate data gathering methods, use of standardized and non-standardized assessment tools, interpretation of results and documentation of evaluation findings.

OT 519  Prof Development Seminar  2 cr
Introduction to professional behavior and interpersonal dynamics in a seminar format. Emphasizes self-awareness, self-assessment, communication issues and the value of life-long learning. Also includes medical terminology.

OT 520  OT Int I Lecture  3 cr
Occupational therapy intervention for persons with developmental and acquired impairments and disabilities affecting self care skills. A life span approach will be taken with emphasis on occupational performance components and context. Therapeutic interventions will emphasize problem-solving, clinical reasoning, and occupational performance synthesis to enhance occupational performance and adaptation.

OT 521  Practicum I  1 cr

OT 522  OT Int I Lab  1 cr
This course will consist of lab exercises and hands on practice focused on occupational therapy interventions for persons with developmental and acquired impairments and disabilities affecting self-care. This course will require students to synthesize information and apply evidence-based interventions to enhance occupational performance and adaptation.

OT 523  OT Int I CBL  1 cr
This course will consist of case-based learning exercises focused on occupational therapy interventions for persons with developmental and acquired impairments and disabilities affecting self-care. This course will require students to synthesize information and apply evidence-based interventions to enhance occupational performance and adaptation.

OT 524  Biomed-Phenom Perspect Disab I  3 cr
Biomedical etiology, diagnostic procedures, prognosis, and medical management including pharmacotherapies of selected disorders are presented and contrasted with phenomenological perspectives based on personal narratives. Includes the identification of the consequences of the disorders and their impact on occupational performance.

OT 525  Documentation  3 cr
Overview of basic professional writing skills including: reporting evaluation data, intervention plans, progress notes, and discharge summaries. Includes understanding the varied purposes of documentation as well as legal and ethical issues in documentation.
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<th>Course Code</th>
<th>Course Title</th>
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<td>OT 526</td>
<td>OT for Adults</td>
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<td>OT 527</td>
<td>Occupational Evaluation II</td>
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<td>OT 528</td>
<td>Adult Experiential Learning</td>
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<td>OT 530</td>
<td>OT Int II Lecture</td>
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<td>Occupational therapy intervention for persons</td>
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<td>OT 534</td>
<td>Biomed-Phenom Perspec Disab II</td>
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<td>OT 535</td>
<td>Foundations Low Vision Rehab</td>
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<td>An in-depth examination of conditions causing</td>
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<td>low vision and the assessment and evidence-based</td>
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<td>intervention planning in low vision rehabilitation. Includes the conditions causing low vision, assessments used in the evaluation, interpretation of assessment results and documentation of evaluation findings in intervention planning of low vision rehabilitation.</td>
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<td>OT 536</td>
<td>Management</td>
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<td>OT 537</td>
<td>Group Dynamics</td>
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<td>An analysis of group intervention theories,</td>
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<td>leadership and stages of group development.</td>
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<td>Students will learn how to design group</td>
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<td>interventions for a variety of populations.</td>
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<td>OT 539</td>
<td>Adv Prof Development Seminar</td>
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<td>OT 540</td>
<td>Occupational Intervention III</td>
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<td>OT 541</td>
<td>Practicum III</td>
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OT 542  OT Int III Lab  1 cr
This course is the lab companion to OT 540. Occupational therapy interventions for persons with developmental and acquired impairments and disabilities, with emphasis on UE impairments impacting daily life skills, work and I-adls. These labs will engage students in hands-on learning which emphasize selection and justification of evidence-based, occupation-based, client centered interventions.

OT 543  OT Int III Lab CBL  1 cr
This course is the lab companion to OT 540. Occupational therapy interventions for persons with developmental and acquired impairments and disabilities, with emphasis on UE impairments impacting daily life skills, work and I-adls. Students will be engaged in case-based discussions which emphasize selection, justification, and grading of evidence-based, occupation-based, client centered interventions.

OT 544  Musculoskeletal Assessment  2 cr
Study of structures and functions of the human body with an emphasis on the limbs and back. Instruction includes assessment of the biomechanical functions of the upper and lower extremities.

OT 545  Scientific Inquiry II  2 cr
The application of qualitative and quantitative research concepts and statistical methods in the development and implementation of a scholarly project. Includes data collection and preliminary analysis.

OT 546  Supervision  2 cr
Application of the principles of supervision with special emphasis on the appropriate roles and use of the certified Occupational Therapy Assistant (COTA), aides and non-OT personnel.

OT 547  Research Implementation  1 cr
Students will work in small groups with faculty mentor to conduct research study and collect data. The focus will be seeking participants, obtaining informed consent, and conducting data collection. It will include creation of spreadsheets and conducting preliminary data analysis based on data collected to date.

OT 550  Level II Fieldwork - A  6 cr
A directed experience in evaluation, planning and implementing occupational therapy services under the supervision of an experienced, certified occupational therapist. Designed to emphasize clinical reasoning, entry-level skill acquisition and integration of didactic knowledge with practice.

OT 551  Pract. IV Psych/Soc  1 cr
Observation and limited participation in clinical and community-based settings serving clients with psychosocial and behavioral needs. Students will study evidence-based interventions that promote performance of various age appropriate and culturally relevant occupations. Emphasis will be placed on the behavioral, psychological and/or social factors promoting or hindering performance.

OT 552  OT School-Based Practice  3 cr
This course will focus on Occupational Therapy in School-Based Practice Settings. Emphasis will be on evidence-based practices to enhance occupational performance in the context of school. Therapeutic interventions will emphasize problem-solving, critical reasoning, and occupational performance synthesis to enhance occupational performance and adaptation. This course will explore current legislation impacting the role of OT in the schools, the evaluation process and assessment tools for this environment and populations, working within various educational team models, transition planning, and promotion of life skill development.

OT 553  OT and the Older Adult  2 cr
This course focuses on the practice of occupational therapy with the older adult. Course content includes conceptual foundations in gerontology, age-related changes affecting occupational performance, evidence-based interventions, the gerontological continuum of care and the interprofessional collaborations that impact the delivery of services to this population.

OT 554  OT & the Older Adult Exp Learn  2 cr
This course focuses on the practice of occupational therapy with the older adult. Course content includes demonstration and analysis of assessments and evidence-based interventions used with the older adult population. This course also applies the OT process inside the gerontological continuum of care and emphasizes the interprofessional collaborations that impact the delivery of services to this population.

OT 555  Level II Fieldwork - B  6 cr
A directed experience in evaluation, planning and implementing occupational therapy services under the supervision of an experienced, certified occupational therapist. Designed to emphasize clinical reasoning, entry-level skill acquisition and integration of didactic knowledge with practice.

OT 558  Tech & Environ Interven in OT  3 cr
An introduction to technology and environmental intervention (TEI; including but not limited to assistive, electronic, information, and rehabilitative) strategies used to increase, maintain or improve functional capabilities of individuals with disabilities and/or to design and implement accessible environments to support full participation in life activities. This course is designed to meet the basic level of competency in TEI for the entry level occupational therapist.

OT 559  Professional Leadership  3 cr
Explores concepts and theories of leadership and emphasizes the importance of leadership in context, interdisciplinary teaming and the nature of change processes and diffusion of innovations. Also includes a discussion of issues of professional concern including but not limited to: OT’s role in emerging practice areas, health disparities, occupational justice, health care reform and current controversies in the field.
OT 570  Community-Based Intervention  3 cr
Occupational therapy intervention for clients in community settings. A lifespan approach will be taken with emphasis on occupational performance areas and contexts. Community interventions will emphasize problem-solving, clinical reasoning and occupational analysis to enhance performance and adaptation. Includes health promotion and disease/disability prevention strategies, innovative program development, evaluation and funding strategies, and community health concepts. Special fee.

OT 575  Advanced Professional Writing  2 cr
Covers a variety of types of professional writing useful to occupational therapists including: grant proposals; journal articles; books; client education materials; and presentation proposals and papers. Includes both the form and content of a range of technical documents as well as the processes of writing, peer review and critique.

OT 576  Res Analysis and Presentation  1 cr
Students will work in small groups with faculty mentor to conduct research study and collect data. Students will complete the data analysis started in previous research classes and then complete a poster presentation of their research.

OT 580  Level II Fieldwork - C  4 cr
A directed experience in evaluation, planning and implementing occupational therapy services under the supervision of an experienced, certified occupational therapist. Designed to emphasize clinical reasoning, entry-level skill acquisition and integration of didactic knowledge with practice.

OT 585  Level II Fieldwork - D  4 TO 12 cr
A directed experience in evaluation, planning and implementing occupational therapy services under the supervision of an experienced, certified occupational therapist. Designed to emphasize clinical reasoning, entry-level skill acquisition and integration of didactic knowledge with practice.

OT 590  Special Topics -  1 TO 6 cr
A variable topics course covering areas not available in other occupational therapy courses. A subtitle identifying the topic will be entered on the student's record.

OT 598  Independent Study in OT  1 TO 6 cr
Special studies directly relevant to the practice of occupational therapy. The student will select an area of interest in which they wish to become more proficient. A faculty member will provide guided study, supervision and assistance in developing appropriate learning experiences.

PE-Activity Courses (PE)

PE 101  PE Activity -  1 cr
Instruction and practice of basic sport and activity skills. A varying content course that gives students choices from designated semester offerings. May be repeated for credit.

PE 102  Weight Training  1 cr
A progressive resistance training course designed to improve muscular strength and endurance. May be repeated for credit.

PE 103  PE Activity -  1 cr
Instruction and practice of sport and activity skills. A varying content course that gives students choices from designated semester offerings. May be repeated for credit. An additional fee will be charged for these activities.

PE 104  PE Activity -  1 cr
Instruction and practice of basic sport and activity skills. A varying content course that gives students choices from designated semester offerings. May be repeated for credit. An additional fee will be charged for these activities.

PE 105  PE Activity -  1 cr
Instruction and practice of basic sport and activity skills. A varying content course that gives students choices from designated semester offerings. May be repeated for credit. An additional fee will be charged for these activities.

PE 106  Gymnastics  1 cr
Instruction and practice in gymnastic skills. A varying content course treating different skill levels in gymnastics. May be repeated for credit.

PE 107  PE Activity -  1 cr
Instruction and practice of basic sport and activity skills. A varying content course that gives students choices from designated semester offerings. May be repeated for credit. An additional fee will be charged for these activities.

PE 108  Ballroom Dancing  1 cr
Knowledge, skills, and techniques associated with various forms of ballroom dancing through demonstration, practice and partnering.

PE 109  Swing Dancing  1 cr
Knowledge, skills, and techniques associated with various forms of swing dancing through demonstration, practice, and partnering.

PE 110  Dance -  1 cr
Instruction and practice in dance. A varying content course treating different types of dance such as but not limited to social, folk, square, and dance performance. May be repeated for credit.
PE 112  Latin Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of Latin dancing through demonstration, practice, and partnering.

PE 113  Creative Dance  1 cr  An introduction to dance as an art form; the vocabulary for movement as a means of self-expression. May be repeated for credit.

PE 114  Aerobics  1 cr  Aerobic exercise is a physical fitness program that offers complete and effective conditioning. It involves jogging, jumping, lunging, kicking, and stretching to music.

PE 115  Ballroom and Swing Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of ballroom and swing dancing through demonstration, practice and partnering.

PE 116  Cajun and Swing Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of Cajun and Swing dancing through demonstration, practice, and partnering.

PE 117  Ballet  1 cr  Instruction and practice in ballet. A varying content course treating the different skill levels of ballet with emphasis on correct body placement through barre and centre exercises. May be repeated for credit.

PE 118  Jazz Dancing  1 cr  Instruction and practice in jazz dancing. A varying content course treating the various skill levels of jazz with emphasis on correct body placement through isolation and locomotor techniques. May be repeated for credit.

PE 119  Modern Dance  1 cr  Instruction and practice in modern dance. A varying content course with exposure to various skill levels and modern dance styles. May be repeated for credit.

PE 120  Tennis - Basic  1 cr  Instruction and practice in beginning and intermediate tennis. May be repeated for credit.

PE 121  Golf - Basic  1 cr  Instruction and practice in beginning golf. May be repeated for credit.

PE 122  Bowling  1 cr  Instruction and practice in beginning bowling. Requires special fee. May be repeated for credit.

PE 123  Archery  1 cr  Instruction and practice in beginning archery. May be repeated for credit.

PE 124  Latin and Swing Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of Latin and Swing dancing through demonstration, practice, and partnering.

PE 125  Badminton  1 cr  Instruction and practice in beginning and intermediate badminton. May be repeated for credit.

PE 126  Ballroom and Latin Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of Ballroom and Latin dancing through demonstration, practice, and partnering.

PE 127  Country West/Partner Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of Country Western/Partner dancing through demonstration, practice, and partnering.

PE 128  Dance Performance  1 cr  Knowledge, skills, and techniques associated with various forms of Dance Performance through demonstration and practice.

PE 129  Folk and Square Dancing  1 cr  Knowledge, skills, and techniques associated with various forms of Folk and Square dancing through demonstration, practice, and partnering.

PE 130  Beginning Swimming  1 cr  Instruction and practice in beginning swimming and water safety. Participation fee required. May be repeated for credit.

PE 131  Intermediate Swimming  1 cr  Instruction and practice in intermediate swimming and water safety. Participation fee required. May be repeated for credit.

PE 132  Step Aerobics  1 cr  A physical activity class which includes the instruction and practice of step aerobics. The course is designed to improve cardiovascular and muscular endurance and improve coordination.

PE 133  Muscle Toning and Conditioning  1 cr  Muscle Toning and Conditioning is a physical activity course in which the student, through active participation, will develop knowledge and skills sufficient to tone the body and improve cardiorespiratory fitness using weights, body bars, resistance tubes, and other equipment.

PE 134  Karate I  1 cr  A beginning course in Karate designed to develop physical fitness, self-discipline, the fundamentals and techniques of blocking, punching, striking, kicking, and stances.

PE 135  Karate II  1 cr  An intermediate course in Karate designed as a continuation of Karate I with the introduction of additional blocks, kicks, and footwork. Self-discipline and physical fitness continue to be stressed.
PE 136 Karate III  1 cr
An advanced course in Karate designed as a continuation of Karate II with the addition of more advanced and versatile concepts of speed, distance, timing, and footwork. Vigorous training methods are used and self-discipline is stressed.

PE 138 Tai Chi  1 cr
Tai Chi training presents basic concepts and techniques to enhance physical fitness and develop mental discipline for stress reduction and personal wellness.

PE 139 Yoga  1 cr
The purpose of this course is to introduce the basic concepts of yoga theory, to teach safe yoga posture, and to help participants in developing balance and fitness, as well as manage stress wisely.

PE 141 Softball  1 cr
Instruction and practice in softball. May be repeated for credit.

PE 142 Volleyball  1 cr
Instruction and practice in volleyball. May be repeated for credit.

PE 143 Basketball  1 cr
Instruction and practice in basketball. May be repeated for credit.

PE 144 Soccer  1 cr
Instruction and practice in soccer. May be repeated for credit.

PE 145 Jogging  1 cr
Instruction and practice in the activity of jogging designed to improve cardiovascular endurance.

PE 146 Bicycling  1 cr
An introductory course to bicycling for leisure and fitness emphasizing the selection and care of bicycles, safety concerns, apparel, route selection, bike handling skills, and development of a bicycle fitness program.

PE 147 Racquetball  1 cr
Instruction and practice in racquetball. May be repeated for credit.

PE 148 Intermediate Golf  1 cr
Instruction and practice in intermediate golf. Demonstrable beginner golf skills necessary.

PE 149 Ultimate Frisbee  1 cr
Fundamental skills, rules, and strategies with frisbees with opportunities for participation.

PE 155 Martial Arts -  1 cr
Instruction and practice in various forms of Martial Arts. A varying-content course treating different skill levels of karate, judo, kung-fu etc. Requires special fee. May be repeated for credit.

PE 157 ICA - Varsity Sports  1 cr
Restricted to members of South Alabama intercollegiate athletic teams by special permission of the respective coaches. Includes but not limited to basketball, soccer, baseball, track, golf, tennis, and volleyball. May be repeated for credit with exception of Education majors.

PE 158 Life Skills - Student Athletes  0 TO 1 cr
This course is designed to help the student acquire specific tools and life skills necessary to be a successful student-athlete on the field, in the classroom, and in life. Modeled after the NCAA Champs/Life Skills program, the course explores and develops proficiency in the areas of: academic excellence, athletic excellence, personal development, career development, and community service. The structure will be a combination of class lectures, group discussions, speakers, and activities. Prerequisites: Students enrolled in PE 158 must be an NCAA varsity student-athlete at the University of South Alabama.

Passage USA (PSG)

PSG 001 Adult Development Seminar I  0 cr
A learner-centered approach to developing self-advocacy, academic/career, independent living, and community integration skills is used. Seminar I focuses on personal safety and prevention, campus navigation, learning with technology, and personal care.

PSG 002 Internship/Work Experiences I  0 cr
Individualized instruction focused on career exploration and soft skill development. Students will explore different job and career options during the semester as well as develop skills related to employment.

PSG 003 Adult Dev Sem II  0 cr
A holistic instructional approach addresses individual learning goals in areas of functional skills and knowledge, application, integration, caring, and learning to learn is used. Seminar II focuses on goal setting, self-care, well-being, budgeting, and learning strategies.

PSG 004 Intern/Wrk Exp II  0 cr
Individualized instruction focused workplace documentation, characteristics of good employees and employment development. Students will explore different job and career options while practicing skills they have learned in class in supervised work experiences.

PSG 005 Adult Dev Sem III  0 cr
Students will participate in valuable and diverse learning experiences generalized to multiple environments. Seminar III focuses on transportation to and from campus, managing personal, finances, interpersonal skills development, and citizenship responsibilities.
PSG 006  Intern/Wrk Exp III  0 cr
Students will be placed in supervised internship/work placements and receive on job training. Individual job training will address Adult Education Program goals as well as a student's needs.

PSG 007  Adult Dev Sem IV  0 cr
Through individualized instructions students will refine self-advocacy, academic/career, independent/daily living, and community integration skills. Seminar IV focuses on advanced transportation, budgeting and finances, interpersonal, well-being, and self-care skills.

PSG 008  Intern/Wrk Exp IV  0 cr
Students will have a supervised internship/work experience. Instruction will focus on the skills needed to gain and/or maintain paid employment. Individualized instruction will be provided.

PSG 090  Sp Tp  0 cr
Guided study topics of specific interest to the student. Students will participate in inclusive classes that are part of the USA undergraduate curriculum.

Pharmacology (PHA)

PHA 546  Pharmacology Lit Reports  1 cr
Students and faculty participate in a supervised reading of the current literature and meet periodically (usually once a week) to interact in a discussion of the selected article or topic. The goal of this course is to maintain the faculty's and students' level of information at a "state of the art" in both methods and theory in the discipline and to develop critical skills in reviewing the literature. Student presentation is required to receive credit.

PHA 547  Dir St in Pharmacology  1 TO 6 cr
Students participate in research under the direction of a graduate faculty member. The student may pursue independent research or participate in a literature project. This course should be taken by students who have completed their laboratory rotations, but have not yet submitted a formal research proposal.

PHA 548  Physiological Pharmacology  6 cr
This course covers both cellular and organ system physiology. It is designed to prepare graduate students for Medical Pharmacology (PHA 540), and for research in pharmacology.

PHA 590  Sp Top -  1 TO 3 cr
Each course provides in-depth tutorial exposure to specific areas in the discipline. Student and/or faculty presentations followed by group discussions (usually in the Socratic mode), examine the subject matter in an area of current interest either to one student or to a group of students. Credit and title are arranged with an individual faculty member.

PHA 640  Molecular-Cellular Pharmacology  3 cr
This course consists of presentations and literature discussions. The central themes of signal transduction from cellular receptor to amplified response, structure-activity relationships, and drug design are studied comprehensively. Specific topics include receptor-ligand interactions, receptor structure and coupling mechanisms, the biochemical and molecular aspects of G-proteins, protein phosphorylation mechanisms, molecular modeling, and protein crystallography. A comprehensive course in biochemistry is prerequisite for this course.

PHA 643  Molecular-Cellular Toxicology  3 cr
This course is concerned with the mechanisms by which toxic substances exert their effects at the molecular and cellular level. Detailed analysis of the processes by which toxic materials are metabolized to toxic intermediates is addressed. The mode of action of how toxic compounds interact with structural proteins and other macromolecules, enzymes and receptors, and the genome is included. Examples of toxicity of the heart, liver, lung, pancreas, brain, including teratogenic, mutagenic and carcinogenic effects are discussed at the mechanistic level.

PHA 646  Cell Signaling Seminar  1 cr
Students present a research topic for discussion before members of the department. The presentations are usually on a rotational basis. The student may present research data for critique by the faculty.

PHA 799  Research Dissertation  1 TO 6 cr
Independent research by the student under the sponsorship of the graduate faculty in individual departments in the Basic Medical Sciences. Students are required to submit a research project description form before enrolling in this course. Progress reports of the work accomplished are required every six months.

Philosophy (PHL)

PHL 110  Introduction to Philosophy  3 cr
An introduction to philosophical analysis and criticism through a survey of the major branches of philosophy. Topics may include, but are not limited to: the mind/body problem, theory of knowledge, skepticism, ethics, political philosophy, aesthetics, and philosophy of religion. Fulfills the General Education Requirement.
PHL 120  Critical Thinking  3 cr
This course will examine complex types of reasoning, including statistical judgment, decision making, and causal and analogical thinking. Emphasis will be placed on the analysis of concrete examples of reasoning in various fields, including science, religion and theology, politics, law as well as alternative medicine and other non-traditional disciplines. Students will be encouraged to improve their own judgment and decision making by learning how to evaluate arguments and by learning about fallacies, common errors and biases in reasoning and decision making. There will also be extensive discussion on the relation between how people do reason and how they ought to reason. Fulfils the General Education Requirement.

PHL 121  Introduction to Logic  3 cr
Studies arguments: what they are, how to identify them, and how to judge their quality; and examines inductive and deductive arguments in both their informal and formal aspects. Fulfills the General Education Requirement. MA 110 or equivalent is recommended.

PHL 131  Introduction to Ethics  3 cr
Examines ideas about good and bad, right and wrong, and moral obligation through a survey of major ethical systems in western philosophy. The course includes consideration of how these ideas apply to moral problems and issues. Fulfils the General Education Requirement.

PHL 220  Medical Reasoning  3 cr
This course will examine complex types of reasoning, including statistical judgment, decision making and causal and analogical reasoning. Emphasis will be placed on the analysis of concrete examples of reasoning in the medical field. Students will learn how to evaluate arguments, fallacies, common errors, and biases in medical reasoning and decision making.

PHL 231  Social Ethics  3 cr
Readings and analyses of ethical issues in society. Topics may include euthanasia, sexual equality, sexual morality, censorship, world hunger, animal rights, the environment, and capital punishment. Fulfills the General Education Requirement.

PHL 240  Western Philosophy: Classical  3 cr
Survey of classical Greek philosophy. The philosophers surveyed may include Presocratic philosophers, Socrates, Plato, Aristotle, and Hellenistic philosophers. Fulfills the General Education Requirement. Identical with CLA 240. Credit cannot be received for both PHL 240 and CLA 240.

PHL 242  Western Philosophy - Medieval  3 cr
A survey of Medieval Western Latin, Jewish and Islamic philosophers. Identical with REL 242. Credit cannot be received for both REL 242 and PHL 242.

PHL 245  Renaissance-Enlightnment - W  3 cr
Survey of Western philosophy from F. Bacon to Kant with emphasis on the empiricists, rationalists, and Kant. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PHL 251  Philosophy and Cognitive Sci  3 cr
A survey of central concepts and issues in cognitive science, including an informal introduction to automata theory, intelligent systems architecture, and the philosophical issues arising out of computational models of language and cognition.

PHL 290  Special Topics -  1 TO 3 cr
Different themes and issues of philosophical significance will be studied as announced. May be repeated for a maximum of 9 hours.

PHL 301  Skepticism in Media-Philosophy  3 cr
This course examines some of the most fundamental questions about human knowledge, belief and rationality and compares the treatment of such issues in philosophical discussions and contemporary media, especially film. Identical with CA 301. Credit cannot be received for both CA 301 and PHL 301. Pre-requisite: EH 102 Minimum Grade of D or EH 105 Minimum Grade of D.

PHL 310  Classical Mythology  3 cr
Through the disciplines of English and Philosophy, this course will provide an introduction to myths and to the literature that recounts the myths, legends, and folktales of ancient Greece and Rome. This course will also look at how different writers treat the material and why their treatments vary. Credit cannot be received for both PHL 310 and either EH 310 or REL 310 or CLA 310. Pre-requisite: EH 102 Minimum Grade of C or EH 110 Minimum Grade of D or EH 190 Minimum Grade of S and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PHL 311  Classical Political Thought  3 cr
The course examines the central themes of classical Western political philosophy through the reading and discussing of the primary works of such thinkers as Plato, Aristotle, Augustine, and Aquinas. (Cross-listed as CLA 311 and PSC 311)

PHL 312  Renaissance Political Thought  3 cr
The course examines central themes of Renaissance and modern Western political philosophy through the reading and discussing of the primary works of such thinkers as Machiavelli, Hobbes, Locke, and Rousseau. (Cross-listed as PSC 312) Pre-requisite: PSC 130 Minimum Grade of C.
PHL 313 Modern Political Thought - W 3 cr
The course examines central themes of modern Western political philosophy through the reading and discussing of the primary works of such thinkers as Hegel, Mill, Marx, and Nietzsche. (Cross-listed as PSC 313)
Pre-requisite: PSC 130 Minimum Grade of C.

PHL 321 Symbolic Logic 3 cr
A study of sentential and predicate logics and related topics.

PHL 327 Philosophy of Science 3 cr
Studies such topics as method and explanation in the sciences; the demarcation between science and pseudoscience; realist and anti-realist views about scientific theories; the logic of scientific change; confirmation; reduction; laws of nature; underdetermination; and society, science, and values.

PHL 331 Alienation 3 cr
Alienation, a fundamental element in human existence, is analyzed in the philosophy of Marx, Hegel, Dostoevsky, Nietzsche and Sartre, and then used to interpret characters and situations in selected novels and films.

PHL 333 Biomedical Ethics - W 3 cr
Ethical analyses of problems and issues in the biomedical and health-related fields. Topics may include genetic research and technology, abortion, health care, experimentation, and death and dying.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PHL 334 Man and Technology 3 cr
Examines the most common impacts that technology is envisioned to have on both the spirit of the human person and the environment in which that person lives. Both the technologist and anti-technologist arguments will be explored.

PHL 336 The Law and Legal Theory 3 cr
Explores issues and problems in the area of law, including the nature and rule of law, the aims and roles of legal systems, morality, and law, obligations to obey the law, and systematic injustices related to race, ethnicity, gender.
(Cross-listed as CJ 336)

PHL 337 Liability and Punishment 3 cr
Explores theoretical issues and problems in the areas of law--especially criminal law--concerning liability and punishment. Topics to be examined include diminished capacity, theories of punishment, and capital punishment.
(Cross-listed as CJ 337)

PHL 339 Philosophy of Culture 3 cr
Acquaints students with Cassirer's philosophy of culture, with emphasis on the unity of human experience as ramified into myth, language, religion, art, history, science, and politico-social life.

PHL 345 Post-Kant Anglo-American 3 cr
An examination of selected Anglo-American philosophy since 1800. Topics may include pragmatism, ideal language philosophy, and ordinary language philosophy.
Pre-requisite: PHL 121 Minimum Grade of C or (PHL 321 Minimum Grade of C or PHL 324 Minimum Grade of C).

PHL 348 19th C Conti Phil-Lit Theory 3 cr
An examination of selected themes and issues in 19th Century Continental Philosophy and Literary Theory. Topics may include Idealism, Romanticism, Existentialism, Marxism, Freudianism. Identical with EG 348 and LG 348.
Credit cannot be received for both PHL 348 and either EH 348 or LG 348. (For LG credit, students will be required to do some coursework in their language of concentration.)

PHL 349 20th C Conti Phil-Lit Theory 3 cr
An examination of selected themes and issues in 20th Century Continental Philosophy and Literary theory. Topics may include Phenomenology, Existentialism, Hermeneutics, Structuralism, and Post-Structuralism. Identical with EH 349.
Credit cannot be received for both PHL 349 and either EH 349 or LG 349. (For LG credit, students will be required to do some coursework in their language of concentration.)

PHL 351 Philosophy of Religion - W 3 cr
Investigates the nature of religion, including religious experience, religious language, arguments for the existence of God, and the problems of evil. Identical with REL 351.
Credit cannot be received for both PHL 351 and REL 351.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PHL 352 World Religions 3 cr
This course is an introduction to the religions of the world. It is divided into three basic units: Indigenous Religions (of Africa, North America, and Oceania); Eastern Religions (Hinduism, Buddhism, Daoism, Confucianism, Jainism) and Western Religions (Judaism, Christianity, Islam).
The emphasis is on grasping the core principles of each tradition, seeing the ways in which religion meets basic human needs, and religion as a cultural artifact that borrows, adapts, and changes over time. Course is identical with REL 352 and SY 352. Credit cannot be received for both PHL 352 and REL 352 or SY 352.

PHL 354 Philosophies of India 3 cr
Introduces the major religions and philosophies of India by way of the classical Realist/Anti-Realist debate in India. Study of the major religious doctrines of theistic and non-dualist Vedanta, Buddhism, and Jainism, and their philosophical articulation in the Nyaya, Advaita Vedanta, Madhyamaka, and other schools. Identical with REL 354.
Credit cannot be received for both PHL 354 and REL 354.
PHL 355  Chinese Philosophy  3 cr
Introduces the major classical religious and philosophical systems of China by way of an examination of early Confucianism, Mohism, Yangism, Legalism, Taoism, and Chinese Buddhism. Particular emphasis will be placed upon the role of these schools in the development of Chinese religion, morality, and political organization. Identical with REL 355. Credit cannot be received for both PHL 355 and REL 355.

PHL 361  Philosophy of Mind  3 cr
A study of the concept of consciousness and related concepts (e.g., mind, self, thinking) as applied to man, other animals, non-terrestrials, and machines.

PHL 370  Philosophy of Art  3 cr
Acquaints students with main issues in aesthetics. Includes such issues as the nature and function of art and the criteria of aesthetic judgment. Identical with ARH 370. Credit cannot be received for both PHL 370 and ARH 370.

PHL 390  Special Topics -  1 TO 3 cr
Different figures or topics of philosophical significance will be studied as announced. May be repeated for a maximum of 9 hours.

PHL 418  American Political Thought  3 cr
This course examines the central themes, issues, and evolution of American political thought, including how we understand our role and responsibilities in contemporary democracy. (Cross-listed as PSC 418)
Pre-requisite: PSC 130 or PHL 110 or PHL 120 or PHL 121 or PHL 131.

PHL 421  Literary Criticism to 1900 - W  3 cr
Classical, Neoclassical, Romantic, and Victorian literary theory. Identical with EH 421. Credit cannot be received for both PHL 421 and EH 421.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PHL 422  Literary Criticism Sn 1900 - W  3 cr
Modern and Contemporary Literary Theory. Identical with EH 422.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PHL 431  Advanced Ethical Theory  3 cr
Problems in traditional and recent value theory and ethics.

PHL 441  Theory of Knowledge  3 cr
Examines knowledge, its scope and limits. Topics may include the conditions, criteria, and grounds for knowledge, and theories of truth and meaning.
Pre-requisite: PHL 110 Minimum Grade of C or PHL 121 Minimum Grade of C.

PHL 461  Metaphysics - W  3 cr
Studies philosophical theories about the nature of reality, including such topics as what is real, change, the nature of things, universals, and such views as monism, materialism, realism, and idealism. Capstone course for all philosophy concentrations.
Pre-requisite: (PHL 240 Minimum Grade of C or CLA 240 Minimum Grade of C or PHL 241 Minimum Grade of C) and (PHL 243 Minimum Grade of C or PHL 245 Minimum Grade of C) and (PHL 321 Minimum Grade of C or PHL 324 Minimum Grade of C). PHL 240 and CLA 240 and PHL 241 and PHL 243 and PHL 245 and PHL 321 and PHL 324 can be taken concurrently with this course.

PHL 467  Mathematical Logic  3 cr
An introduction to formal first-order logic, first-order metatheory, and its extensions. Topics include axiom systems and their models, completeness, compactness, and recursive sets and functions. Identical with MA 467. Credit cannot be received for both PHL 467 and MA 467.
Pre-requisite: (PHL 321 Minimum Grade of C or PHL 324 Minimum Grade of C) or MA 311 Minimum Grade of C or MA 316 Minimum Grade of C or MA 318 Minimum Grade of C or MA 320 Minimum Grade of C or MA 321 Minimum Grade of C or MA 316 Minimum Grade of C or MA 318 Minimum Grade of C or MA 334 Minimum Grade of C or MA 335 Minimum Grade of C or MA 354 Minimum Grade of C or MA 367 Minimum Grade of C or MA 410 Minimum Grade of C or MA 413 Minimum Grade of C or MA 414 Minimum Grade of C or MA 434 Minimum Grade of C or MA 436 Minimum Grade of C or MA 437 Minimum Grade of C or MA 451 Minimum Grade of C or MA 458 Minimum Grade of C or MA 490 Minimum Grade of C or MA 537 Minimum Grade of C or MA 542 Minimum Grade of C or MA 550 Minimum Grade of C.

PHL 490  Special Topics  3 cr
An investigation of issues and concepts in philosophy for advanced undergraduates and graduate students. May be repeated, when content varies, for a total of six hours. Prerequisites: junior, senior, or graduate standing.

PHL 492  Seminar -  1 TO 3 cr
An investigation of issues and concepts in philosophy for advanced undergraduates and graduate students. May be repeated, when content varies, for a total of 6 hours.

PHL 494  Directed Studies  1 TO 3 cr
Directed research in philosophy under the guidance of a member of the department. Credit according to the magnitude of the individual project. May be repeated, if content varies, for a total of 6 hours. Prerequisites: Junior or senior standing and approval of directing professor and department chair. Prerequisites: Junior, senior, or graduate standing.
PHL 499  Honors Thesis - H (W)  3 TO 6 cr
Extended research paper prepared under direction of thesis advisor plus two-person committee selected by advisor in consultation with student. Prerequisites: The student must have developed a proposal for the thesis in consultation with the advisor, and received permission for the work from the committee. In addition, the student must be a senior major or minor, have completed the logic and history of philosophy requirements, have at least two courses at the 300-level or higher, and have at least a 3.3 GPA in the Philosophy Concentration of the Philosophy major. Credit for this course is only given as an addition to the hours required for the major.

PHL 590  Special Topics -  1 TO 3 cr
Study of individuals or topics of philosophical significance. May be repeated for credit when content varies. Enrollment is limited to students in disciplines other than philosophy. May be repeated, if content varies, for a total of 6 hours.

PHL 594  Directed Studies  3 cr
Directed research in philosophy under the guidance of a member of the department. May be repeated, if content varies, for a total of six hours. Prerequisite: Graduate Student in Department conferring a Graduate Degree (hence not open to Philosophy majors in any Concentration in Philosophy).

Physical Therapy (PT)

PT 101  Orientation to PT  1 cr
An orientation to the physical therapy profession, college life and the physical therapy department.

PT 490  Special Topics  1 TO 3 cr
Directed study of topics of interest related to human movement and physical therapy.

PT 499  Senior Honors Project-H-W  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project relevant to the field of Physical Therapy study that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty members chaired by the honors mentor. This course is requires permission of the department chair and completion of an approved project prospectus.

PT 501  Kinesiology/Lab  3 cr
A study of human movement as it relates to clinical physical therapy practice with an emphasis on biomechanical principles of movement and normal gait. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 502  Foundational Concepts/Lab  3 cr
An introduction to the principles and techniques of patient care utilized in physical therapy practice. These basic therapeutic skills include, but are not limited to, positioning, draping, patient transfers, assistive gait devices, wheelchair use, and basic examination. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 503  Therapeutic Modalities/Lab  3 cr
A study of specific techniques of therapeutic intervention in physical therapy practice including electrophysical agents and manual therapy techniques. The electrophysical agents unit will include the physical principles, physiological effects, therapeutic uses and clinical application of thermal, mechanical, electrical and photic energy. The manual intervention unit will include manual therapy techniques including soft tissue massage. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 504  Examination Methods/Lab  3 cr
An introduction to the principles and techniques of patient care utilized in physical therapy practice. Assessments of joint range of motion, muscle strength and length testing, massage, and soft tissue mobilization are presented. Techniques include performing patient interview/history. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 505  Prosthetics & Orthotics/Lab  3 cr
A course to identify disablement risk factors and provide educational intervention to prevent certain diseases and facilitate a positive change in the health behavior of patients. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 506  Orthopedic Science/Lab  3 cr
Etiology, diagnostic procedures and radiography, medical management, physical therapy examination, evaluation, and intervention of selected musculoskeletal disorders with an emphasis on the upper extremities. Additionally includes the fundamentals, principles, and practice of therapeutic exercise. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.
PT 507  Neurologic Science/Lab  3 cr
This course includes study of the principles and concepts of normal human movement and PT examination/evaluation in patients with disorders of the neuromuscular systems across the lifespan. The course will focus on examination (patient/client history, systems review, tests and measurements), evaluation of examination data (clinical decision-making), with formulation of problems list, functional goals and PT plan of care. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 508  Therapeutic Exercise/Lab  3 cr
Etiology, diagnostic procedures and radiography, medical management, physical therapy examination, evaluation, and intervention of selected musculoskeletal disorders with an emphasis on the upper extremities. Additionally includes the fundamentals, principles, and practice of therapeutic exercise. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 509  Cardiovascular & Pulmonary Sci  3 cr
A study of the principles and practice of physical therapy for patients with cardiovascular and pulmonary disease, including radiography, and medical and surgical management. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree. Includes laboratory study.

PT 510  Differential Diagnos & Assess  3 cr
A course focusing on the use of screening tests and clinical tools to enhance the therapist's role as an independent practitioner with the ability to identify medical conditions of concern that require referral to an appropriate health care provider. This course counts toward the Masters of Physical Therapy degree but does not count toward the Doctor of Physical Therapy degree.

PT 520  Clinical Kinesiology  3 cr
A study of human movement as it relates to clinical physical therapy practice with an emphasis on biomechanical principles of movement and normal gait. Include laboratory study.

PT 521  Introductory PT Skills  4 cr
A introduction to the principles and techniques of patient care utilized in physical therapy practice. These basic therapeutic skills include, but are not limited to, positioning, draping, patient transfers, assistive gait devices, wheelchair use and basic examination. Techniques including assessment of joint range of motion, muscle strength and length testing, massage, and soft tissue mobilization are presented. Include laboratory study.

PT 525  Therapeutic Intervention  4 cr
A study of specific techniques of therapeutic intervention in physical therapy practice including electrophysical agents and manual therapy techniques. The electrophysical agents unit will include the physical principles, physiological effects, therapeutic uses and clinical applications of thermal, mechanical, electrical, and photic energy. The intervention unit will include therapy techniques including soft tissue massages, include laboratory study.

PT 527  Medical Screening  2 cr
A course focusing on the use of screening tests and clinical tools to enhance the therapist role as an independent practitioner with the ability to identify medical conditions of concerns that require referral to an appropriate health care provider.

PT 590  Sp Tp-    1 TO 3 cr
Directed study of topics of interest to human movement and physical therapy.

PT 600  Human Anatomy I  3 cr
A comprehensive study of human anatomy concentrating on the nervous, skeletal, arthrodial, muscular and circulatory systems of the superficial back, upper extremities, head, neck, and face. Lab consists of prosected material and dissection of aforementioned body parts. Skeletal models and diagnostic imaging will be introduced of each area of dissection. Labs also include surface palpation on live human subjects. Special fee.

Pre-requisite: PT 600 Minimum Grade of C. PT 600 can be taken concurrently with this course.

PT 601  Human Anatomy II  3 cr
A comprehensive study of human anatomy concentrating on the nervous, skeletal, arthrodial, muscular and circulatory systems of the deep back, trunk, pelvis, and lower extremity. Lab consists of prosected material and dissection of the aforementioned body parts. Skeletal models and diagnostic imaging will be introduced for each area of dissection. Labs also include surface palpation on live human subjects. Special fee.

PT 602  Life Span Human Development  2 cr
A study of the process of typical human development and aging across the life span, including neuromotor development in childhood and changes associated with aging.

Pre-requisite: PT 682 Minimum Grade of S.

PT 603  Neuroscience in Phys Therapy  3 cr
A survey of the structure and function of the nervous system, with emphasis on principles related to physical therapy practice. Includes laboratory study of anatomic specimens. Special fee.

Pre-requisite: PT 601 Minimum Grade of C and PT 682 Minimum Grade of S.
PT 604 Pathophysiology I 2 cr
A physiological approach to the study of pathological changes in the human body brought about by trauma or disease, including cell injury, inflammation, immunopathology, neoplasia, infections, and the musculoskeletal and endocrine systems.
Pre-requisite: PT 601 Minimum Grade of C.

PT 605 Human Learning 1 cr
This course incorporates application of the principles of human learning to patient/client management including patient, family/caregivers, and community education.
Roles of the physical therapist as a clinical educator and academician are discussed as well as opportunities/responsibilities for lifelong learning and professional development.
Pre-requisite: PT 673 Minimum Grade of C.

PT 606 Pharmacology in Rehabilitation 2 cr
A study of pharmacological principles in relation to rehabilitation, with emphasis on the possible benefits and side-effects of chemotherapeutic agents on patients receiving physical therapy treatment.
Pre-requisite: PT 607 Minimum Grade of C and PT 682 Minimum Grade of S.

PT 607 Pathophysiology II 2 cr
A physiological approach to the study of pathological changes in the human body brought about by trauma or disease, including vascular, hematopoietic, nutritional, neurologic, urogenital, GI and hepatobiliary systems.
Pre-requisite: PT 604 Minimum Grade of C.

PT 610 Principles of Research & EBP 2 cr
An introduction to evidence-based practice as it relates to physical therapy, including basic understanding of research designs and research statistics, formulating appropriate clinical questions based on patient/client, accessing current evidence using databases and other resources to answer clinical/practice issues, and summarizing evidence for clinical case application.

PT 611 Research Proposal Development 2 cr
This course prepares students to achieve professional competence in critical appraisal of professional literature and in the design of a clinically relevant research proposal as an entry-level Doctor of Physical Therapy student. The course focuses on the foundational aspects of research methodology including research design, data analysis, and critical evaluation of research evidence.

PT 612 Research Project 2 cr
This course focuses on implementation of the research proposal developed in PT 611. In addition, this course is designed for the student to contribute to the evidence for practice through the dissemination of clinical research outcomes, including professional reporting of the results to peers in written and oral platform presentation formats.
Pre-requisite: PT 611 Minimum Grade of C.

PT 613 Clinical Case Report 2 cr
This course allows the student to develop a clinical case report based on a patient the student has treated during a full-time internship, an administrative/education process or a clinical risk management situation. An in-depth analysis of research from recent publications related to the case is required. The student will prepare a written case report and a presentation in seminar format.
Pre-requisite: PT 612 Minimum Grade of C and PT 674 Minimum Grade of C.

PT 620 Clinical Kinesiology 3 cr
A study of human movement as it relates to clinical physical therapy practice with an emphasis on biomechanical principles of movement and normal gait. Includes laboratory study.

PT 621 Introductory PT Skills 4 cr
An introduction to the principles and techniques of patient care utilized in physical therapy practice. These basic therapeutic skills include, but are not limited to, positioning, draping, patient transfers, assistive gait devices, wheelchair use, and basic examination. Techniques including assessment of joint range of motion, muscle strength and length testing, massage, and soft tissue mobilization are presented. Includes laboratory study.

PT 622 Exercise Physiology 4 cr
A study of the effect of physical activity on human physiology with an emphasis on the musculoskeletal, cardiovascular/pulmonary, and endocrine systems. Modes of exercise, environmental considerations, and selected clinical populations are also covered in this course. Includes laboratory study.

PT 625 Therapeutic Intervention 4 cr
A study of specific techniques of therapeutic intervention in physical therapy practice including electrophysical agents and manual therapy techniques. The electrophysical agents unit will include the physical principles, physiological effects, therapeutic uses and clinical application of thermal, mechanical, electrical and photic energy. The manual intervention unit will include manual therapy techniques including soft tissue massage. Includes laboratory study. Special fee.

PT 626 Health Prom & Prev in PT 2 cr
A course to identify disablement risk factors and provide educational intervention to prevent certain diseases and facilitate a positive change in the health behavior of patients.
Pre-requisite: PT 622 Minimum Grade of C.

PT 627 Medical Screening 2 cr
A course focusing on the use of screening tests and clinical tools to enhance the therapist's role as an independent practitioner with the ability to identify medical conditions of concern that require referral to an appropriate health care provider.
Pre-requisite: PT 607 Minimum Grade of C.
PT 628  Mobility Ortho & Prosthetics  2 cr
The study of human functional mobility, including pathological aspects of locomotion. The course will also address related topics including prosthetics and orthotics. Pre-requisite: PT 620 Minimum Grade of C.

PT 631  Musculoskeletal Disorders I  4 cr
Etiology, diagnostic procedures and radiography, medical management, physical therapy examination, evaluation, and intervention of selected musculoskeletal disorders with an emphasis on the upper extremities. Additionally includes the fundamentals, principles, and practice of therapeutic exercise. Includes laboratory study. Pre-requisite: PT 601 Minimum Grade of C.

PT 632  Musculoskeletal Disorders II  3 cr
Etiology, diagnostic procedures and radiography, medical management, physical therapy examination, evaluation, and intervention of selected musculoskeletal disorders with emphasis on the lower extremities. Includes laboratory study. Pre-requisite: PT 631 Minimum Grade of C. PT 631 can be taken concurrently with this course.

PT 633  Musculoskeletal Disorders III  4 cr
A continuation of PT 632 that includes etiology, diagnostic procedures and radiography, medical management, physical therapy examination, evaluation, and intervention of selected musculoskeletal disorders with an emphasis on the lumbar spine and pelvis. Includes laboratory study. Pre-requisite: PT 632 Minimum Grade of C.

PT 634  Musculoskeletal Disorders IV  3 cr
A continuation of PT 633 that includes etiology, diagnostic procedures and radiography, medical management, physical therapy examination, evaluation, and intervention of selected musculoskeletal disorders with an emphasis on the cervical and thoracic spine. Includes laboratory study. Pre-requisite: PT 633 Minimum Grade of C. PT 633 can be taken concurrently with this course.

PT 635  Musculoskeletal Disorders V  2 cr
Special topics in the management of musculoskeletal conditions including, but not limited to, ergonomics, sports physical therapy, and musculoskeletal issues in obstetrics and gynecology. Includes laboratory study. Pre-requisite: PT 634 Minimum Grade of C.

PT 640  Neuromusc PT Exam/Eval  4 cr
This course includes study of the principles and concepts of normal human movement and PT examination/evaluation in patients with disorders of the neuromuscular systems across the lifespan. The course will focus on examination (patient/client history, systems review, tests and measurements), evaluation of examination data (clinical decision-making), with formulation of problem list, functional goals and PT plan of care. Includes laboratory study. Pre-requisite: PT 602 Minimum Grade of C and PT 603 Minimum Grade of C.

PT 641  Ped Neuromusc PT Exam/Eval  2 cr
This course prepares the student to provide services to children with special health care needs/disabilities and their families in a manner consistent with family-centered care; includes patient/family history, systems review, and tests and measures and opportunities for clinical decision-making and establishing a plan of care based on examination data with emphasis on prognosis for a wide variety of pediatric diseases, conditions, and syndromes impacting typical development. Review of pediatric practice settings and legislation, medical management, pharmacologic treatment, radiographic imaging and other diagnostic testing related to neuromuscular disorders and developmental delay are included. Includes laboratory study.

PT 642  Neuromuscular PT Intervention  4 cr
A course to follow PT 640 and 641 with added emphasis on principles and concepts of physical therapy intervention in patients with disorders of the neuromuscular systems. Includes laboratory study. Pre-requisite: PT 641 Minimum Grade of C.

PT 650  PT in Integumentary Disorders  4 cr
A study of the practice of physical therapy in management of skin disorders and underlying disease with an emphasis on the patient with open wounds, including burns. Includes laboratory study. Pre-requisite: PT 604 Minimum Grade of C.

PT 660  PT Cardio/Pulmonary Disorders  4 cr
A study of the principles and practice of physical therapy for patients with cardiovascular and pulmonary disease, including radiography, and medical and surgical management. Includes laboratory study. Pre-requisite: PT 607 Minimum Grade of C and PT 622 Minimum Grade of C and PT 682 Minimum Grade of S.

PT 671  Clinical Case Studies I  1 cr
A case-based course providing opportunities to develop clinical judgment as part of patient management including establishment of differential diagnosis, patient prognosis, and development of a plan of care for patients with musculoskeletal disorders of peripheral joints. Students will also analyze cases involving ethical, legal and psychosocial concerns for which professional decisions and interprofessional practice or referrals are necessary.

PT 672  Clinical Case Studies II  1 cr
A case-based seminar designed to provide opportunities to develop clinical reasoning and communication skills as part of patient management. Students will develop skills in communicating with the healthcare team, recognizing and ameliorating barriers to patient outcomes, and developing plans of care for patients with complex health and psychosocial issues. Pre-requisite: PT 671 Minimum Grade of C and PT 682 Minimum Grade of S.
PT 673 Clinical Case Studies III 1 cr
A case-based course to provide opportunities to apply clinical reasoning to promote evidence-based physical therapy practice by integrating best available evidence for patient management and to challenge the status quo of practice to raise it to the most effective level of care.
Pre-requisite: PT 672 Minimum Grade of C.

PT 674 Clinical Synthesis & Pat Mgmt 1 cr
A review and synthesis of physical therapy examination, evaluation, and development of a plan of care in patient management for specific clinical disorders, emphasizing clinical decision-making based on clinical experience and evidence.
Pre-requisite: PT 627 Minimum Grade of C and PT 635 Minimum Grade of C and PT 642 Minimum Grade of C.

PT 675 Comprehensive Capstone 1 cr
This course is a continuation of PT 674 that emphasizes comprehensive review and preparation for taking the National Physical Therapy Examination. All students must pass the final capstone exam to be awarded the DPT degree.
Pre-requisite: PT 674 Minimum Grade of C and PT 683 Minimum Grade of C.

PT 676 Advanced Topics in PT 1 cr
This elective course involves advanced study (beyond entry level) of selected topics within physical practice, research, education and leadership. Topics vary from year to year.
Pre-requisite: PT 673 Minimum Grade of S and PT 635 Minimum Grade of C and PT 642 Minimum Grade of C and PT 650 Minimum Grade of C and PT 660 Minimum Grade of C.

PT 680 Professional PT Practice 2 cr
A study of physical therapy as a profession with emphasis on the history of physical therapy; role and scope of practice; professional, ethical, and legal responsibilities; licensure; physical therapy education; contemporary practice issues; and professional communication.

PT 681 Clinical Practice Issues - W 2 cr
This course is designed to prepare the student for clinical practice by incorporating the patient management model, clinical decision-making models, health care systems, patient documentation including electronic health records, cultural competence, universal precautions, and risk management.
Pre-requisite: PT 680 Minimum Grade of C.

PT 682 PT Internship I 6 cr
A planned learning experience of clinical education designed to integrate previous didactic knowledge in a full time, supervised clinical internship in Physical Therapy practice settings.
Pre-requisite: PT 620 Minimum Grade of C and PT 625 Minimum Grade of C and PT 632 Minimum Grade of C.

PT 683 PT Internship II 8 cr
A continuation of PT 682, providing another planned learning experience, designed to integrate previous knowledge in a full time, supervised clinical internship in Physical Therapy practice settings. Good Academic Standing with no required course retakes pending.
Pre-requisite: PT 635 Minimum Grade of C and PT 642 Minimum Grade of C and PT 650 Minimum Grade of C and PT 660 Minimum Grade of C and PT 682 Minimum Grade of S.

PT 684 PT Internship III 6 cr
A continuation of PT 682 and 683, providing another planned learning experience, designed to integrate previous knowledge in a full time, supervised clinical internship in Physical Therapy practice settings. Good Academic Standing with no required course retakes pending.
Pre-requisite: PT 683 Minimum Grade of C.

PT 685 Management of PT Practice 3 cr
A study of current organizational and management principles and issues related to health care delivery systems with special emphasis on the current and future roles of Physical Therapy.
Pre-requisite: PT 687 Minimum Grade of C.

PT 686 PT Internship IV 6 cr
A continuation of PT 682, 683 and 684, providing another planned learning experience, designed to integrate previous knowledge in a full time, supervised clinical internship in physical therapy practice settings. Good academic standing with no required retakes pending.
Pre-requisite: PT 684 Minimum Grade of P. PT 684 can be taken concurrently with this course.

PT 687 Profess Topics in PT Practice 1 cr
This course entails a continuation of professional practice issues including interprofessional education and practice, communication between patient/client and healthcare provider, patient-centered care, and cultural aspects of patient care which all relate to professional development as a competent healthcare provider.
Pre-requisite: PT 681 Minimum Grade of C.

PT 689 Evidence Library Skills 1 cr
Discussion of evidence-based practice (EBP) and the importance of literature searching and information management skills.

PT 690 Update in Exercise Physiology 1 cr
This course reviews the effects of exercise intervention upon human physiology and the acute and chronic adaptations associated with physical activity.

PT 691 Clinical Reasoning 2 cr
This course should be one of the first courses taken and will include principles of evidence-based practice, access and evaluation of scientific literature, and application to clinical decision making in specific patient populations.
PT 692  Applied Human Movement  2 cr
This course will focus on recent advances in the
understanding of human movement with particular emphasis
on biomechanics, kinesiology and motor control.

PT 693  Adv in Musculoskeletal PT  2 cr
An interactive discussion and exploration of physical
therapy practice for populations with orthopedic disorders,
including examination, intervention and outcome. The
focus will be on evidence-based clinical practice. Course
topics will include updated research on operative and non-
operative procedures for the peripheral joints and spine,
spinal and peripheral joint diagnostic imaging (radiography),
pharmacology, therapeutic exercise, clinical reasoning, and
lifespan issues with a focus on geriatrics.

PT 694  Adv in Neuromuscular PT  2 cr
An interactive discussion and exploration of physical therapy
practice for populations with neuromuscular disorders,
including examination through intervention and outcomes.
The focus will be on clinical practice in this population based
on evidence. The course will include diagnostic imaging
(radiography), pharmacology, therapeutic exercise, clinical
reasoning, and lifespan issues with a focus on geriatrics.

PT 695  Adv in Integumentary PT  2 cr
An interactive discussion of new developments in skin and
wound care with an emphasis on development of a plan of
care that evolves over the episode of care, prevention of
recurrence, and the interaction with the patient and other
health care providers.

PT 696  Adv in Cardiovasc/Pulmonary PT  2 cr
An in-depth, interactive discussion of issues related to
the examination, evaluation, and plan of care for patients/
clients with primary and secondary cardiovascular and
pulmonary disorders across the lifespan. Clinical reasoning,
pharmacology and imaging techniques will be emphasized.

PT 697  DPT Directed Study  1 TO 3 cr
Directed research or comprehensive review of evidence-
based literature completed in a clinical area of interest
under the supervision of a faculty mentor. The student will
document incorporation of course content into their current
clinical practice. This course may be repeated up to two
times with a different focus-topic each time.

PT 698  Professional Issues/Ethics  2 cr
Discussion of current professional issues including clinical
practice, management, legal, ethical/moral and psychosocial
topics embedded within the current health care market faced
by health care providers. This course will include interactive
discussions among students and instructor and will include
literature to support discussion topics.

PT 699  DPT Seminar -  1 TO 8 cr
An elective seminar to update information in specific areas
of study. Course number may be repeated three times.

Physician Assistant Studies (PA)

PA 510L  CM I Lab  1 cr
PA 520L  CM II Lab  1 cr
PA 530L  CM III Lab  1 cr
PA 540L  CM IV Lab  1 cr
PA 501  Clinical Preceptorship I  4 cr
The student is assigned to a clinical setting to obtain
knowledge, skills and attitudinal/behaviors professional
components. These competencies are to be obtained while
engaging in all aspects of patient care through: the medical
interview, history and physical exam, critical thinking,
knowledge base, diagnosis, treatment plan, and patient
education. As well as appropriate health maintenance and
disease prevention measures.

PA 502  Clinical Preceptorship II  4 cr
The student is assigned to a clinical setting to obtain
knowledge, skills and attitudinal/behavioral professional
components. These competencies are to be obtained while
engaging in all aspects of patient care through: the medical
interview, history, and physical exam, critical thinking,
knowledge base, diagnosis, treatment plan, and patient
education. As well as appropriate health maintenance and
disease prevention measures.

PA 503  Clinical Preceptorship III  4 cr
The student is assigned to a clinical setting to obtain
knowledge, skills and attitudinal/behavioral professional
components. These competencies are to be obtained while
engaging in all aspects of patient care through: the medical
interview, history and physical exam, critical thinking,
knowledge base, diagnosis, treatment plan, and patient
education. As well as appropriate health maintenance and
disease prevention measures.

PA 504  Clinical Preceptorship IV  4 cr
The student is assigned to a clinical setting to obtain
knowledge, skills, and attitudinal/behavioral professional
components. These competencies are to be obtained while
engaging in all aspects of patient care through: the medical
interview, history and physical exam, critical thinking,
knowledge base, diagnosis, treatment plan, and patient
education. As well as appropriate health maintenance and
disease prevention measures.
PA 505  Clinical Preceptorship V  4 cr
The student is assigned to a clinical setting to obtain knowledge, skills and attitudinal/behavioral professional components. These competencies are to be obtained while engaging in all aspects of patient care through the medical interview, history and physical exam, critical thinking, knowledge base, diagnosis, treatment plan, and patient education. As well as appropriate health maintenance and disease prevention measures.

PA 506  Clinical Preceptorship VI  4 cr
The student is assigned to a clinical setting to obtain knowledge, skills and attitudinal/behavioral professional components. These competencies are to be obtained while engaging in all aspects of patient care through the medical interview, history and physical exam, critical thinking, knowledge base, diagnosis, treatment plan, and patient education. As well as appropriate health maintenance and disease prevention measures.

PA 507  Clinical Preceptorship VII  4 cr
The student is assigned to clinical setting to obtain knowledge, skills and attitudinal/behavioral professional components. These competencies are to be blended while engaging all aspects of patient care through medical interview, history and physical exam, critical thinking, knowledge base, diagnosis, treatment plan, and patient education. As well as appropriate health maintenance and disease prevention measures.

PA 508  Clinical Preceptorship VIII  4 cr
The student will choose from a variety of available elective rotations in order to engage in all aspects of patient care including: the medical interview, history, and physical exam, critical thinking, knowledge base, diagnosis, treatment plan, patient education, appropriate health maintenance and disease prevention measures. The goal of elective rotations is to provide the student the opportunity to explore area of interest for further employment and increase knowledge in area of weakness.

PA 509  Clinical Preceptorship IX  4 TO 8 cr
The student will choose from a variety of available elective rotations in order to engage in all aspects of patient care including: the medical interview, history, and physical exam, critical thinking, knowledge base, diagnosis and treatment plan, patient education, appropriate health maintenance and disease prevention measures. The goal of elective rotations is to provide the student the opportunity to explore areas of interest for further employment or increase knowledge in areas of weakness.

PA 510  Clinical Medicine I  4 cr
Clinical Medicine I (PA 510) is the introductory course in a four part series covering primary care clinical medicine. It is designed to incorporate and integrate topics and content both horizontally and vertically throughout the didactic and clinical curricula. The course is divided into lecture and lab sections that will be graded separately and will provide opportunities for the student to develop critical thinking skills essential to patient evaluation and management. The use of patient simulations is included. Introductory subject matter covered during this first course will include physical examination skills and use of medical instruments, patient history taking, patient counseling, patient education, interpersonal and communication skills, and epidemiology. Additional topics will include an introduction to behavioral medicine, professionalism, interprofessional education, medical research methods, introduction to medical literature, introduction to laboratory diagnosis and introduction to nutrition. Finally, medical and social topics addressed will include the primary care medical home, rural and medically underserved populations, social determinants of health, healthy people 2020, public health issues and community health.

PA 511  Human Gross Anatomy  5 cr
This is a course in gross anatomy of the human body systems utilizing human cadavers and prosections. Emphasis is placed on the relationships between structure and function.

PA 512  Physiology  6 cr
Physiology (PA 512) is the scientific basis of medicine. This course will provide the PA student with sufficient in-depth knowledge of cellular and organ physiology necessary for understanding of normal and abnormal human body function and for advancement to courses in pathophysiology, pharmacology, and clinical medicine. This course is divided into six sections which present the basic scientific concepts of human physiology with clinical applications and relevance to disease states: 1) cellular, neuromuscular, autonomic, and cardiac physiology; 2) circulatory physiology; 3) respiratory physiology; 4) renal, electrolyte, and acid-base physiology; 5) gastrointestinal and metabolic physiology; 6) endocrinology.

PA 514  Intro to Infectious Disease  1 cr
This course is designed to provide PA students a solid foundation in basic immunology, microbial genetics, structure, nutrition and basic host-parasite relationships. The course will place particular emphasis on the role and application of these subject matters in disease manifestations as well as use/development of diagnostic and treatment modalities. Vulnerability of special populations and interactions between various environmental, social and behavioral factors with the human host in relationship to infection control and treatment will also be emphasized.
PA 516  Physician Assistant Issues I  2 cr
Physician Assistant (PA) Issues I is the introductory course in a three part Social Science and Public Health Course Series to integrate the social sciences with the clinical and basic sciences. Health and health problems result from a complex interplay of factors: 1) individual health-related behaviors, 2) physical environment, 3) health care; access and quality, and 4) social and economic environments. This course will also cover commonly encountered clinical practice issues and their impact on physician assistant practice. Patient education across the lifespan and health education in health care are explored in this course series with community outreach and service learning projects utilizing resources from USA Center for Academic Service-Learning and Civic Engagement. This course requires active student participation in all lectures, discussions, readings, group projects, field exercises, presentations, writing assignments, and other methods of instruction.

PA 517  Clinical Preceptorship X  4 cr
The student is assigned to a clinical setting to obtain knowledge, skills and attitudinal/behavioral professional components. These competencies are to be obtained while engaging in all aspects of patient care through: the medical interview, history and physical exam, critical thinking, knowledge based, diagnosis, treatment plan, and patient education. As well as appropriate health maintenance and disease prevention on measures.

PA 518  Clinical Preceptorship XI  4 TO 8 cr
The student will choose from a variety of available elective rotations in order to engage in all aspects of patient care including: the medical review, history and physical exam, critical thinking, knowledge base, diagnosis and treatment plan, patient education, appropriate health maintenance and disease prevention measures. The goal of elective rotations is to provide the student the opportunity to explore areas of interest for further employment or increase knowledge in areas of weakness.

PA 520  Clinical Medicine II  6 cr
Clinical Medicine II (PA 520) is the second course in a four part series covering primary care clinical medicine and surgery topics. It is designed to incorporate and integrate topics and content both horizontally and vertically throughout the didactic and clinical curricula. The course is divided into lecture and lab sections that will be graded separately and will provide opportunities for the student to develop critical thinking skills essential to patient evaluation and management. The use of standardized patients, patient simulations and clinical experiences are included. Topics will include a continuation of physical examination skills, patient history taking, patient counseling, patient education, epidemiology, history of the PA Profession, professionalism, interpersonal and communication skills, interprofessional education, medical research methods, and researching medical literature, the primary care medical home, rural and medically underserved populations, social determinants of health, healthy people 2020, public health issues, and community health care. Specific topics covered in PA 520 include dermatology, ophthalmology, ENT, cardiovascular medicine, EKG, pulmonary medicine, nephrology, and GU medicine. Imbedded in this course will be topics in infectious disease and diagnostic data that will align with the subject matter covered during this semester.

PA 521  Pathophysiology I  4 cr
Pathophysiology I (PA 521) is the first course in a three-part series that covers the alterations in normal physiology that occur in human disease states. This course will provide the PA student with sufficient in-depth knowledge of pathophysiology necessary for understanding of abnormal human body function and for advancement to subsequent courses in pathophysiology, pharmacology, and clinical medicine. Topics will include an overview of cellular pathophysiology, followed by specific topics that align with the organization of the clinical medicine series: cardiovascular pathophysiology, EKG, pulmonary pathophysiology, and renal/GU pathophysiology.

PA 522  Pharmacology I  4 cr
Pharmacology I (PA 522) is the first course in a three-part series that covers the basic scientific concepts of drug classification, mechanism of action, toxicity, and clinical use of drugs. Introductory topics will include the laws and regulations governing the use of pharmaceuticals, prescriptive practices, basic science and properties of drug molecules, drug interactions, and clinical pharmacology of the autonomic nervous system. Specific topics will align with the organization of the clinical medicine series: cardiovascular drugs, pulmonary drugs, drug therapy of renal and genitourinary disease.
PA 523  Diag Data and Interp I  2 cr
(Previously PA 524) Interpretation of Diagnostic Data and Studies I, will introduce students to basic concepts of laboratory medicine including different methods of sample gathering and transport, basic phlebotomy, interpretation of blood counts and analysis of the differential blood counts, coagulation studies and anticoagulant monitoring, interpretation of metabolic panels, evaluating electrolyte abnormalities, and ordering and interpreting bacterial culture and susceptibilities. The course will focus on and correlate with laboratory assays and procedures taught during Clinical Medicine II. Syllabi and tentative schedules of lectures for the course are attached.

PA 526  Physician Assistant Issues II  2 cr
This course is the second in a three part series covering commonly encountered issues and their impact on physician assistant practice. Introductory subject matter covered during this second course will include social determinants of health affecting diversity and inclusion; cultural competence; workforce shortage; health disparities; health literacy; public health, primary care medicine with a focus on rural and medically underserved medicine, evidence-based medicine, patient belief systems, health care delivery systems, professionalism, interprofessional education and collaboration, social determinants of healthcare, medical ethics, and population/public health. Equally important is the challenge and significance of patient education across the lifespan and health education in health care. This course requires active student participation in all lectures, discussions, readings, group projects, field exercises, presentations writing assignments, and other methods of instruction.

PA 530  Clinical Medicine III  6 cr
Clinical Medicine III (PA 530) is the third course in a four part series covering primary care clinical medicine and surgery topics. It is designed to incorporate and integrate topics and content both horizontally and vertically throughout the didactic and clinical curricula. The course is divided into lecture and lab sections that will be graded separately and will provide opportunities for the student to develop critical thinking skills essential to patient evaluation and management. The use of standardized patients, patient simulations and clinical experiences are included. Topics will include a continuation of complete and focused physical examination skills, patient history taking, patient counseling, patient education, epidemiology, normal and abnormal development, history of the PA Profession, professionalism, interpersonal and communication skills, interprofessional education, medical research methods, and researching medical literature, the primary care medical home, rural and medically underserved populations, social determinants of health, healthy people 2020, public health issues, and community health care. Specific topics covered in PA 530 include neurology, rheumatology, hematology/oncology, orthopedic medicine, gastrointestinal medicine, and psychiatric/behavioral medicine. Included in this course will be topics in infectious disease and diagnostic data that will align with the subject matter covered during this semester.

PA 531  Pathophysiology II  4 cr
Pathophysiology II (PA 531) is the second course in a three-part series that covers the alterations in normal physiology that occur in human disease states. This course will provide the PA student with sufficient in-depth knowledge of pathophysiology necessary for the understanding of abnormal human body function and for advancement to subsequent courses in pathophysiology, pharmacology, and clinical medicine. Topics will align with the subject matter in Clinical Medicine II (PA 530): neurology, rheumatology, endocrinology, hematology, oncology, gastrointestinal, and psychiatric disorders.

PA 532  Pharmacology II  4 cr
This course is the second of a proposed three part pharmacology series that used to be taught in two sections during the spring and summer semesters as PA 532 and PA 542. The course will continue to cover the basic scientific concepts of drug classification, mechanism of action, toxicity, and clinical use of drugs. Other topics will include drug interaction and the properties of drug molecules. Specific topics will align with the organization of the clinical medicine series.
PA 533  Diag Data & Interp II  2 cr
Interpretation of Diagnostic Data and Studies II, will focus on ordering and interpretation of laboratory tests and imaging studies associated with diseases of the urinary tract system including basic and advanced urinalysis and their interpretation, laboratory tests and imaging studies associated with diseases of the gastrointestinal tract to include liver, pancreas, small intestine and colorectal regions, basic and advanced immunohematology and imaging to investigate autoimmune disorders, and advanced genetic testing and procedures. This course will advance the students knowledge of laboratory medicine and will focus on those laboratory assays relevant to the topic covered in Clinical Medicine III.

PA 536  Physician Assistant Issues III  2 cr
Issues in Healthcare and Population Health is a class that intends to instruct students on the many faces of health care. Healthcare involves different people who have different roles in the patient's healthcare experience. The goal is for the student to gain a deeper understanding of the many aspects of practicing medicine. Issues in Healthcare and Population Health IV (PA 536) is the last in a three part series covering commonly encountered issues and their impact on physician assistant practice. This series is designed to incorporate and integrate topics and content both horizontally and vertically throughout the didactic and clinical curricula. The course will utilize a variety of teaching strategies getting the student involved in the learning process.

PA 540  Clinical Medicine IV  7 cr
Clinical Medicine IV (PA 540) is the final course in a four part series covering primary care clinical medicine and surgery topics. It is designed to incorporate and integrate topics and content both horizontally and vertically throughout the didactic and clinical curricula. The course is divided into lecture and lab sections that will be graded separately and will provide opportunities for the student to develop critical thinking skills essential to patient evaluation and management. The use of standardized patients, patient simulations and clinical experiences are included. Topics will include a continuation of complete and focused physical examination skills, patient history taking, patient counseling, patient education, interpersonal and communication skills, epidemiology, normal and abnormal development, history of the PA Profession, professionalism, interprofessional education, medical research methods, and researching medical literature, the primary care medical home, rural and medically underserved populations, social determinants of health, healthy people 2020, public health issues, and community health care. Specific topics covered in PA 540 include geriatric medicine, pediatric medicine, surgery, OB/GYN medicine, emergency medicine, ACLS, and clinical year transition. Included in this course will be topics in infectious disease and diagnostic data that will align with the subject matter covered during this semester.

PA 541  Pathophysiology III  3 cr
This course is the third of three sections of pathophysiology that used to be taught during the fall semester as a single course PA 523. The course will provide students with an understanding of abnormal body functions including an overview of cellular pathophysiology followed by specific topics that align with the organization of the clinical medicine series.

PA 542  Pharmacology III  3 cr
This course is the third of a proposed three part pharmacology series that used to be taught in two sections during the spring and summer semesters as PA 532 and PA 542. The course will continue to cover the basic scientific concepts of drug classification, mechanism of action, toxicity, clinical use of drugs, drug interaction and the properties of drug molecules. Specific topics will align with the organization of the clinical medicine series.

PA 544  Diag Data and Interp III  2 cr
(Previously PA 541) Interpretation of Diagnostic Data and Studies III, will introduce students to basic radiology concepts by teaching fundamentals of radiology, basic imaging techniques (ultrasound, vascular imaging, advanced imaging techniques (CT Scan and MRI with and without contrast), and PET scan. The course will hone student knowledge of all diagnostic modalities through intensive case-based approach to the interpretation of laboratory assays.

PA 545  Summative Evaluation  4 cr
PA 595 is designed to evaluate student learning at the end of the 27 month PA training program. The assessments used in this course will help determine the level at which students achieved the expectations for their learning as prescribed and to identify instructional areas that may need additional attention. The summative assessments include: 1) comprehensive examination, 2) OSCE with standardized patient, 3) on-line board review and 4) Capstone Project. A comprehensive written examination will be administered as a final evaluation of the student's progress. This test is also designed to prepare the graduate for the NCCPA exam.

Physics (PH)

PH 101L  Introduction to Astronomy Lab  0 cr
Laboratory course for the Introduction to Astronomy course. Student must pass this laboratory course to receive a passing grade in the PH 101 course. Students must take PH 101L concurrently with PH 101 and pass the lab. The PH 101L grade is a component of the PH 101 course grade. Co-requisite: PH 101
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>PH 101L</td>
<td>Concepts of Physics Laboratory</td>
<td>0 cr</td>
<td>Laboratory course for the Concepts of Physics course. Student must pass this laboratory course to receive a passing grade in the PH 104 course. Students must take PH 104L concurrently with PH 104 and pass the lab. The PH 104L grade is a component of the PH 104 course grade. Co-requisite: PH 104</td>
</tr>
<tr>
<td>PH 104L</td>
<td>Alg-Trig Based Physics I Lab</td>
<td>0 cr</td>
<td>Laboratory course for the first semester of a two-semester introductory sequence in algebra/trigonometry-based physics. Student must pass this laboratory course to receive a passing grade in the PH 114 course. Students must take PH 114L concurrently with PH 114 and pass the lab. The PH 114L grade is a component of the PH 114 course grade. Co-requisite: PH 114</td>
</tr>
<tr>
<td>PH 115L</td>
<td>Alg-Trig Based Physics II Lab</td>
<td>0 cr</td>
<td>Laboratory course for the second semester of a two-semester introductory sequence in algebra/trigonometry-based physics. Student must pass this laboratory course to receive a passing grade in the PH 115 course. Students must take PH 115L concurrently with PH 115 and pass the lab. The PH 115L grade is a component of the PH 115 course grade. Co-requisite: PH 115</td>
</tr>
<tr>
<td>PH 201L</td>
<td>Calculus-Based Physics I Lab</td>
<td>0 cr</td>
<td>Laboratory course for the first semester of a two-semester introductory sequence in calculus-based physics. Student must pass this laboratory course to receive a passing grade in the PH 201 course. Students must take PH 201L concurrently with PH 201 and pass the lab. The PH 201L grade is a component of the PH 201 course grade. Co-requisite: PH 201</td>
</tr>
<tr>
<td>PH 202L</td>
<td>Calculus-Based Physics II Lab</td>
<td>0 cr</td>
<td>Laboratory course for the second semester of a two-semester introductory sequence in calculus-based physics. Student must pass this laboratory course to receive a passing grade in the PH 202 course. Students must take PH 202L concurrently with PH 202 and pass the lab. The PH 202L grade is a component of the PH 202 course grade. Co-requisite: PH 202</td>
</tr>
<tr>
<td>PH 303L</td>
<td>Modern Physics Lab</td>
<td>0 cr</td>
<td>Laboratory course for the Modern Physics Course. Students must take PH 303L concurrently with PH 303 and pass the lab. The PH 303L grade is a component of the PH 303 course grade. Co-requisite: PH 303</td>
</tr>
<tr>
<td>PH 385L</td>
<td>Experimental Physics Lab</td>
<td>0 cr</td>
<td>Laboratory course for the Experimental Physics course. Students must take PH 385L concurrently with PH 385 and pass the lab. The PH 385L grade is a component of the PH 385 course grade. Co-requisite: PH 385</td>
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**PH 101 Introduction to Astronomy 4 cr**
This is a descriptive survey course of elementary astronomy with laboratory intended for both non-science and science majors. Topics covered include a description of the celestial sphere, a tour of the Solar System, techniques for measuring and classifying stars, stellar evolution, white dwarfs, black holes, neutron stars, galaxies, and Big Bang cosmology. Students must take PH 101L concurrently and pass the lab. The PH 101L grade is a component of the PH 101 course grade. Fee. Core course. Co-requisite: PH 101L

**PH 104 Concepts of Physics 4 cr**
A descriptive overview of the entire field of physics with laboratory, including the concepts of scalars and vectors. Newton's law, momentum and energy conservation, rotational motion, fluids, heat and thermodynamics, sound, electricity and magnetism, optics, atomic and nuclear physics, relativity, and elementary particle physics. This course is intended to provide the non-scientist with substantial insight into the physical behavior of matter and energy. Extensive demonstrations accompany the presentation of material to illustrate key concepts. Fee. Students must take PH 104L concurrently and pass the lab. The PH 104L grade is a component of the PH 104 course grade. Core course. Co-requisite: PH 104L

**PH 107 Contemporary Topics in Physics 1 cr**
Intended for physics majors in their first year or others interested in physics as a possible major. This course will survey current "hot topics" in physics, basic useful techniques in physics problem-solving, physics as a career, and research in physics at USA. This course is not intended to satisfy the science requirements within the College of Arts & Sciences.

**PH 114 Physics with Algebra-Trig I 5 cr**
First semester of a two-semester introductory course in algebra/trigonometry-based physics with laboratory and recitation. This course covers mechanics and thermodynamics: one- and two-dimensional motion, vectors, Newton's laws of motion, work and energy, momentum and collisions, circular motion, rotational motion, properties of solids and fluids, the laws of thermodynamics, kinetic theory of matter, simple harmonic motion, and wave motion. The laboratory uses computerized data acquisition and analysis for most of the experiments. Students must take PH 114L concurrently and pass the lab. The PH 114L grade is a component of the PH 114 course grade. Fee. Core course. Co-requisite: PH 114L
Pre-requisite: ACT Math 25 or MA 113 Minimum Grade of D or MA 115 Minimum Grade of D or MA 125 Minimum Grade of D or MA 120 Minimum Grade of D.
PH 115  Physics with Algebra -Trig II  5 cr
Second semester of a two-semester introductory course in algebra/trigonometry-based physics with laboratory and recitation. This course covers electrostatics, DC circuits, RC circuits, magnetic fields and forces, Faraday's Law, AC circuits, geometrical optics, interference and diffraction of light, the special theory of relativity, quantum physics, and atomic and nuclear physics. The laboratory uses computerized data acquisition and analysis for most of the experiments. Students must take PH 115L concurrently and pass the lab. The PH 115L grade is a component of the PH 115 course grade. Fee. Core course.
Co-requisite: PH 115L
Pre-requisite: PH 114 Minimum Grade of D.

PH 194  Dir St - Variable Content Lab  1 cr
A directed studies course to substitute for a laboratory credit for students who have successfully completed an introduction to astronomy or concepts of physics course at another university without the laboratory. Students taking this course must get the approval of the Physics Department Chair. This course may be taken up to two times (once for each course). Fee.

PH 201  Calculus-Based Physics I  4 cr
First semester of a two-semester introductory course in calculus-based physics with recitation and laboratory. This course covers: one and two-dimensional motion, vectors, Newton's laws of motion and their applications, work and energy, momentum and collisions, circular motion, rotational motion, properties of materials, simple harmonic motion, wave motion and topics in thermodynamics. The laboratory uses computerized data and analysis for most of the experiments. Core course.
Co-requisite: PH 201L
Pre-requisite: MA 125 Minimum Grade of D and (EH 101 Minimum Grade of C or ACT English 27 or SAT Critical Reading 610 or ELPT 33 ).

PH 202  Calculus-Based Physics II  4 cr
Second semester of a two-semester introductory course in calculus-based physics with laboratory. This course covers electrostatic fields and Gauss' law, electric potential, electric circuits, magnetic fields, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves and optics. The laboratory uses computerized data acquisition and analysis for most of the experiments. Students must take PH 202L concurrently and pass the lab. The PH 202L grade is a component of the PH 202 course grade. Fee. Core course.
Co-requisite: PH 202L
Pre-requisite: PH 201 Minimum Grade of D and MA 126 Minimum Grade of D and (EH 101 Minimum Grade of C or ACT English 27 or SAT Critical Reading 610 or ELPT 33 ).

PH 290  Special Topics-  1 TO 4 cr
Topics of current interest but not available in regularly scheduled sophomore level courses. This course may be repeated once for credit when the content varies and may be taken twice for up to eight hours.

PH 294  Dir St - Variable Content Lab  1 cr
A directed studies course to substitute for a laboratory credit for students who have successfully completed a calculus or algebra-based physics lecture course at another university without the laboratory. Students taking this course must get the approval of the Physics Department Chair. This course may be taken up to two times (once for each of the missing laboratories). Prerequisite: Permission of the Department Chair
Pre-requisite: EH 101 Minimum Grade of C.

PH 301  Introductory Astrophysics  3 cr
Application of the principles of physics to the study of astronomical phenomena. Topics include celestial mechanics, stars and stellar evolution, the Milky Way and other galaxies, and cosmological models. Prior knowledge of astronomy is not required.
Pre-requisite: PH 115 Minimum Grade of D or PH 202 Minimum Grade of D and MA 125 Minimum Grade of D.

PH 303  Modern Physics  4 cr
This course, with laboratory, surveys physics of the twentieth century. Topics covered include special relativity, wave-particle concepts, the Schroedinger equation and quantum theory of the hydrogen atom, atomic spectra and structure, molecular spectra, the solid state, nuclear structure, radioactivity, and elementary particles. The accompanying laboratory includes experimental investigations of important topics in the subject of Modern Physics. Computerized numerical and graphical analysis of data is extensively used in the laboratory. Laboratory reports are written with word processors and submitted in a format consistent with articles submitted to student research journals. Students must take PH 303L concurrently and pass the lab. The PH 303L grade is a component of the PH 303 course grade.
Co-requisite: PH 303L
Pre-requisite: PH 303L and MA 125 Minimum Grade of D and PH 202 Minimum Grade of D or PH 115 Minimum Grade of D. PH 303L can be taken concurrently with this course.

PH 301  Condensed Matter Physics  3 cr
This is an introductory course which covers modern condensed matter physics. Topics include crystal structure and properties; electronic structure of insulators, semiconductors and metals; and phenomena of current research interest and technological relevance. Methods used to measure and analyze these phenomena will also be discussed.
Pre-requisite: PH 303 Minimum Grade of D.

PH 346  Classical and Modern Optics  3 cr
Wave motion, reflection, refraction, dispersion, diffraction, interference phenomena, Fourier spectroscopy, lasers and other modern applications of optics.
Pre-requisite: PH 202 Minimum Grade of D and MA 125 Minimum Grade of D.
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<tr>
<th>Course</th>
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<th>Credits</th>
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<tr>
<td>PH 348</td>
<td>Electricity and Magnetism I</td>
<td>3 cr</td>
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<tr>
<td>PH 349</td>
<td>Electricity and Magnetism II</td>
<td>3 cr</td>
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<tr>
<td>PH 354</td>
<td>Electronics</td>
<td>3 cr</td>
</tr>
<tr>
<td>PH 366</td>
<td>Physical Mechanics I</td>
<td>3 cr</td>
</tr>
<tr>
<td>PH 367</td>
<td>Physical Mechanics II</td>
<td>3 cr</td>
</tr>
<tr>
<td>PH 385</td>
<td>Experimental Physics - W</td>
<td>3 cr</td>
</tr>
<tr>
<td>PH 390</td>
<td>Special Topics</td>
<td>1 TO 3 cr</td>
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<tr>
<td>PH 411</td>
<td>Computational Methods in Phys</td>
<td>3 cr</td>
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<tr>
<td>PH 448</td>
<td>Elementary Quantum Mechanics I</td>
<td>3 cr</td>
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<tr>
<td>PH 449</td>
<td>Elementary Quantum Mechanics II</td>
<td>3 cr</td>
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**PH 348 Electricity and Magnetism I**: First of two-semester sequence in electromagnetism. Topics include a review of vector analysis, Coulomb's law, Gauss' law, calculation of the scalar potential, electric fields in matter, the Biot-Savart law, Ampere's law, the vector potential, magnetostatics in matter, electrodynamics, Faraday's law, inductance, Maxwell's correction to Ampere's law and Maxwell's equations. Pre-requisite: MA 227 Minimum Grade of D and PH 202 Minimum Grade of D or PH 115 Minimum Grade of D.

**PH 349 Electricity and Magnetism II**: Second of two-semester sequence in electromagnetism. Topics include electromagnetic wave propagation in free space, electromagnetic wave propagation in materials, reflection and transmission at interfaces, wave guides, electromagnetic radiation, optical dispersion, and electrodynamics extended to the special theory of relativity. Pre-requisite: PH 348 Minimum Grade of D.

**PH 354 Electronics**: This course is intended to provide a theoretical and practical background in electronics. Topics include AC circuits, diode circuits, single-stage amplifiers, op-amps and feedback, and digital electronics. This course is not intended to satisfy the technical elective requirements for Electrical Engineering. The course will include periodic laboratory work. Pre-requisite: MA 126 Minimum Grade of D and PH 202 Minimum Grade of D or PH 115 Minimum Grade of D.

**PH 366 Physical Mechanics I**: First course in a two-semester sequence in classical mechanics. Topics include motion of particles in one-dimension, one-dimensional motion theories, harmonic oscillations, damped oscillations, forced oscillations, kinematics in multiple dimensions, momentum and energy theorems, the central force problem, motion under inverse square law forces, planetary orbital motion, Rutherford scattering, conservation theorems for multi-particle systems and their applications, collisions, coupled-harmonic oscillators, and rigid body rotation about a fixed axis. Pre-requisite: MA 227 Minimum Grade of D and PH 202 Minimum Grade of D.

**PH 367 Physical Mechanics II**: Second course in a two-semester sequence in classical mechanics. Topics include: moving and rotating coordinate systems. Lagrange's equation and applications, Hamiltonian formulation, inertia and stress tensors, rotations of rigid bodies and the theory of small oscillations. Pre-requisite: PH 366 Minimum Grade of D.

**PH 385 Experimental Physics - W**: A course in the methods and techniques of experimental physics. A number of experiments in the area of classical mechanics, atomic physics, molecular physics, and nuclear physics will be performed and analysis is required. Computerized numerical and graphical analysis of data is extensively used in the laboratory. Laboratory reports are written with word processors and submitted in a format consistent with articles submitted to a student research journal. Students must take PH 385L concurrently and pass the lab. The PH 385L grade is a component of the PH 385 course grade. Co-requisite: PH 385L Pre-requisite: PH 385L and PH 303 Minimum Grade of D. PH 385L and PH 303 can be taken concurrently with this course.

**PH 390 Special Topics**: Topics of current interest not available in a regularly scheduled course. This course may be repeated once for credit and may be taken for up to six hours credit.

**PH 411 Computational Methods in Phys**: Use of computers in physics research (industrial, applied, or basic) is now common. This course will introduce advanced undergraduate physics students to computer solutions of physics problems. Particular attention will be paid to problems that have no analytic solutions and may only be solved numerically. This course will introduce several numeric methods and apply them to specific problems from quantum mechanics, electrodynamics, and mechanics. Students will write a series of programs in the Fortran or the C programming language and use them to solve undergraduate level physics problems. Pre-requisite: PH 303 Minimum Grade of D and MA 238 Minimum Grade of D and CIS 210 Minimum Grade of D or CIS 227 Minimum Grade of D.

**PH 448 Elementary Quantum Mechanics I**: The first course of a two-semester sequence in Quantum Mechanics. Topics include an introduction to Hilbert space and operators, the quantum state and observables, the Heisenberg uncertainty principle, time evolution of the quantum state, application of the Schrodinger equation to one-dimensional systems, and the solution of the hydrogen atom. Pre-requisite: MA 238 Minimum Grade of D and CH 302 Minimum Grade of D.

**PH 449 Elementary Quantum Mechanics II**: The second course of two-semester sequence in Quantum Mechanics. Topics include a continuation in the mathematical formulation of quantum mechanics, angular momentum, perturbation theory, identical particles and spin, collision theory, and the semi-classical treatment of radiation. This course is recommended for students anticipating graduate study in physics. Pre-requisite: PH 448 Minimum Grade of D.
PH 463 Thermodynamics-Stat Mechanics 3 cr  
An in-depth course in thermodynamics and statistical mechanics. Topics include simple thermodynamics systems, work, heat and the first law of thermodynamics, ideal gases, the second law of thermodynamics, entropy, enthalpy, Helmholtz and Gibbs functions, TdS equations, heat capacity, partition function, equipartition of energy, statistical distribution of molecular speeds, thermal properties of solids, higher order phase transitions, chemical equilibrium, Thomson effect, Bose-Einstein statistics, Nuclear Magnetism, and the third law of thermodynamics. Pre-requisite: PH 202 Minimum Grade of D and MA 227 Minimum Grade of D.

PH 494 Directed Studies - 1 TO 3 cr  
PH 494 Directed Studies 1-3 cr Directed research under the supervision of a faculty member. Topics generally coincide with the research interest of the supervising faculty member. Pre-requisite: Permission of the Physics department chair. May be taken three times for up to 9 hours.

PH 499 Senior Thesis-Honors - H 6 cr  
A written thesis that is part of the Honors Senior Project which is submitted to partially satisfy the requirements for a Degree in Physics with distinction. The Senior Thesis will be written on research done in collaboration with an Honors Physics Faculty member in the Junior/ Senior year. The Senior Thesis will be reviewed by a committee of Honors Physics Faculty. Upon approval by the committee the Senior Honors candidate will present the Senior Thesis at Honors Student Colloquium. This course may be repeated once for credit. Prerequisite: The Honors candidate must have developed in the last semester of the previous year a prospectus with the Physics Faculty Mentor and presented this prospectus at the Annual Honors Student Colloquium, also permission of the Department Chair.  
Pre-requisite: EH 102 Minimum Grade of C.

PHS 590 Special Topics - 1 TO 3 cr  
Each course provides in-depth tutorial exposure to specific areas in the discipline. Student and/or faculty presentations followed by group discussions (usually in the Socratic mode), examine the subject matter in an area of current interest either to one student or to a group of students. Credit and title are arranged with an individual faculty member.

PHS 651 Adv Cardiovascular Physiology 5 cr  
This is an advanced course covering cardiac function and metabolism, peripheral circulation, and microcirculation. The objective is to provide the student with a thorough understanding of cardiovascular physiology at both the organ and cellular level.

PHS 654 Transport Physiology Barriers 2 cr  
This course is designed to present a detailed analysis of physiological membranes and the physical principles governing the movement of solute and water across these barriers.

PHS 656 Cell Signaling Seminar 1 cr  
Students present a research topic for discussion before members of the department. The presentations are usually scheduled on a rotational basis. The student may present research data for critique by the faculty.

PHS 799 Research-Dissertation 1 TO 6 cr  
Independent research by the student under the sponsorship of the graduate faculty in individual departments in the Basic Medical Sciences. Students are required to submit a research project description form before enrolling in this course. Progress reports of the work accomplished are required every six months.

Political Science (PSC)

PSC 101 Intro Pol Sci - Honors - H 3 cr  
This course offers an overview of government including its structures and systems; and of the political actors who shape government, including citizens, groups, and elites. The course canvasses U.S government; comparatives politics; international relations, and more.

PSC 130 Intro to US Government 3 cr  
Stresses formation and principles of the United States Constitution and roles of Congress, the President, and the Courts in the American system of government. Considers popular participation in politics, rights and responsibilities of citizens, and current public problems. Core Course. PSC and CJ majors must pass with a "C" or better.

PSC 250 Comparative Politics 3 cr  
This course examines government systems across the globe, including both democracies and authoritarian systems. It analyzes strategic interactions between political actors in a diverse set of contexts, as well as the key theories that helps us to understand politics.
PSC 270  International Relations  3 cr
This introductory course in the theory and practice of International Relations includes topics such as IR's importance and principal actors, as well as causes of conflict and war, conflict resolutions, international law, globalization, global events, issues, and problems.

PSC 301  Public Policy  3 cr
This course provides an overview of policy and the policymaking process in the United States. Topics include what issues rise to the public agenda; how politicians, groups, and citizens shape and implement policy; and how political scientists can analyze public policy.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 310  Research Methods-W  3 cr
This course examines research methodologies in the social sciences, covering the tools and techniques for designing and conducting research, including collecting and analyzing data, and presenting findings. (Cross-listed as CJ 310).
Pre-requisite: (PSC 130 Minimum Grade of C or CJ 105 Minimum Grade of C) and (PSC 331).

PSC 311  Classical Political Thought  3 cr
The course examines the central themes of classical Western political philosophy through the reading and discussing of the primary works of such thinkers as Plato, Aristotle, and Aquinas. (Cross-listed as PHL 311 and CLA 311)
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 312  Renaissance Political Thought  3 cr
The course examines central themes of Renaissance and modern Western political philosophy through the reading and discussing of the primary works of such thinkers as Machiavelli, Hobbes, Locke, and Rousseau. (Cross-listed as PHL 312)
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 313  Modern Political Thought-W  3 cr
The course examines central themes of modern Western political philosophy through the reading and discussing of the primary works of such thinkers as Hegel, Mill, Marx, and Nietzsche. (Cross-listed as PHL 313)
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 330  Judicial Process  3 cr
The study of the U.S. judicial process at both federal and state court levels. (Cross-listed as CJ 330)
Pre-requisite: (PSC 130 Minimum Grade of C or CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C).

PSC 331  Constitutional Law  3 cr
The study of the principles of constitutional powers and liberties examined through an analysis of decisions and opinions by the U.S. Supreme Court. (Cross-listed as CJ 331)
Pre-requisite: (PSC 130 Minimum Grade of C or CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C).

PSC 340  Race, Gender, & Politics  3 cr
This course is designed to provide students with a critical examination of race and gender in the political system. From the founding to the present, politics and government reflect ideological judgments about who gets what, when, and how. As such, government has legitimized only certain individuals as political actors, certain identities as politically relevant, certain relationships as important, and certain practices as the means by which one might change political status.
Prerequisite: Sophomore standing or above.

PSC 345  Women and Politics  3 cr
The central premise of this course is that politics cannot be fully understood without including gender as an analytical construct. From the founding to the present, politics and government reflect ideological judgments about who gets what, when and how. As such, government has legitimized only certain individuals as political actors and certain identities as politically relevant. This course sets out to discover how gender “matters” in U.S. politics.

PSC 347  Public Opinion and Polit Part  3 cr
The formation, composition, distribution, and measurement of public opinions and its effect upon public policy.

PSC 354  Media and Politics  3 cr
Examining the role and influence of mass media in politics, exploring how and why the media contribute to and shape democracy.
Pre-requisite: (PSC 130 Minimum Grade of C or CA 100 Minimum Grade of C or CA 101 Minimum Grade of C).

PSC 360  Politics of Europe  3 cr
The course provides an overview of the political systems, institution, public policies, and actors in European Politics. Countries covered may include Germany, France, Great Britain, and Russia.
Pre-requisite: PSC 130 Minimum Grade of C or PSC 250 Minimum Grade of C or IS 100 Minimum Grade of C.

PSC 363  Crime and Politics in LatinAm  3 cr
An examination of the violent crime epidemic affecting many parts of Latin America, with specific focus on the themes of democratic transition, political economy, and foreign relations with the United States. Same as CJ 363 and IS 363.
Pre-requisite: (PSC 130 or CJ 105 or IS 100).

PSC 365  Politics of the Middle East-W  3 cr
The course introduces to the Middle East. Besides a timeline of Middle Eastern history and a brief profile of the Middle Eastern countries, the course focuses on the political histories and current politics of a select influential Middle Eastern countries.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (PSC 130 Minimum Grade of C or PSC 250 Minimum Grade of C or IS 100 Minimum Grade of C).
PSC 368  Politics of South Asia-W  3 cr
This course introduces and explains the importance of South Asia. While briefly profiling all South Asian countries, the course focuses on the political histories, leaders, current politics, and sociocultural environments of India, Pakistan, Bangladesh, and Afghanistan.
Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C) and (PSC 130 Minimum Grade of C or PSC 250 Minimum Grade of C or IS 100 Minimum Grade of C).

PSC 372  American Foreign Policy  3 cr
This course examines the central themes, issues, and evolution of American political thought, including how we understand our role and responsibilities in contemporary democracy. (Cross-listed as PHL 418)
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 401  Public Administration  3 cr
The study of the implementation of public policy at the national, state, and local levels, and the study of the planning, organization and coordination of government operations.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 411  Criminal Justice Admin  3 cr
This course applies management and organization theories to a broad range of criminal justice institutions, actors, and agencies—including police, courts, and corrections, treatment centers, drug traffickers, and homeland security. (Cross-listed as CJ 411)
Pre-requisite: PSC 130 Minimum Grade of C or CJ 105 Minimum Grade of C or CJ 205 Minimum Grade of C.

PSC 418  American Political Thought  3 cr
The course examines the central themes, issues, and evolution of American political thought, including how we understand our role and responsibilities in contemporary democracy. (Cross-listed as PHL 418)
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 432  State and Local Government  3 cr
An overview of U.S. state and local government systems, including an analysis of the politics, public policy, and administration within the U.S. states and localities.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 436  Politics of Urban Govt  3 cr
A study of urban growth with an analysis of the major problems facing large cities in this country. Political, administrative, social, and economic aspects will be covered

PSC 437  US Congress and Policymaking  3 cr
An inside view of the U.S. Congress centered on the process for passing laws and policymaking, including an examination of influential legislation.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 438  US Presidency  3 cr
A study of the U.S. presidency covering the political development and organization of the office; executive powers and responsibilities; elections and campaigns; and presidential communication.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 440  Adv Studies in Pub Policy  3 cr
Advanced study in the field of public policy.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 450  Adv Study Comparative Pol  3 cr
Advanced study in the field of comparative politics.
Pre-requisite: PSC 250 Minimum Grade of C or PSC 130 Minimum Grade of C or IS 100 Minimum Grade of C.

PSC 452  Politics of the Muslim World  3 cr
This course introduces students to the Muslim World. Subjects covered will include Islam, Islamic civilization, Islamism, and a timeline of Muslim political history. It also profiles the most influential Muslim countries, Islamists, and Islamic organizations.
Pre-requisite: PSC 130 Minimum Grade of C or PSC 250 Minimum Grade of C or IS 100 Minimum Grade of C.

PSC 453  Campaign and Election Comm.  3 cr
Focuses on political communication in the context of U.S. campaigns and elections. Same as CA 453.
Pre-requisite: (PSC 130 or CA 100 or CA 101).

PSC 456  Social Media and Politics  3 cr
An examination of how and why digital information technologies are used by citizens, activists, journalists, and politicians to shape and influence individual's political participation and engagement and public policy and society.
Pre-requisite: (PSC 130 or CA 100 or CA 101).

PSC 469  Criminal Justice Policies  3 cr
This course examines how public policy has shaped both the criminal justice system and its results, with particular emphasis on crime control.
Pre-requisite: CJ 105 or PSC 130.

PSC 470  Adv Study Intl Relations  3 cr
Advanced study in the field of international relations.
Pre-requisite: PSC 270 Minimum Grade of C or PSC 130 Minimum Grade of C or IS 100 Minimum Grade of C.

PSC 481  Public Policy and Aging  3 cr
This course examines government responses to the growing number of older Americans. Topics include retirement and pensions, health care, housing, social services, intergenerational issues, and policy advocacy for the elderly.
Pre-requisite: PSC 130 Minimum Grade of C.
PSC 489 Leadership and World Leaders 3 cr
An overview of the definitions, characteristics, and typologies of leadership, with a focus on lives and legacies of global influential political leaders over the past century. Pre-requisite: PSC 130 Minimum Grade of C or IS 100 Minimum Grade of C.

PSC 490 Special Topics 3 cr
Study of a significant topic or problem in political science. May be repeated up to two times when the content varies. Pre-requisite: PSC C Minimum Grade of C.

PSC 491 Seminar on Terrorism 3 cr
This course will introduce students to the meaning, characteristics, typology, history, and causes of terrorism. The course will also summarize the biographies of the most prominent terrorists, past and present, and conclude, with a discussion of counter-terrorism strategies. Cross-listed with IS 491. Pre-requisite: EH 101 Minimum Grade of C and EH 102 Minimum Grade of C and IS 100 Minimum Grade of C.

PSC 492 PSC Capstone Seminar-W 3 cr
The Capstone course brings together key components from across political science. As part of the course, students will write a research paper, present their research, and take a comprehensive exam. PSC majors must earn a grade of C or better for graduation. Pre-requisite: PSC 130 Minimum Grade of C and PSC 250 Minimum Grade of D and PSC 270 Minimum Grade of D and (PSC 310 Minimum Grade of D or CJ 310 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PSC 494 Directed Studies 1 TO 3 cr
Students will pursue directed research or readings on an approved topic in political science. Pre-requisite: PSC 130 Minimum Grade of C.

PSC 496 Internship 3 cr
An opportunity to gain experiential learning through a supervised internship offered by a variety of political science and government related agencies. Pre-requisite: PSC 130 Minimum Grade of C.

PSC 499 Honors Thesis - W 3 TO 6 cr
The research and writing of a major paper in the field of political science. Registration is open to political science majors in the Honors College or those pursuing Department Honors. Pre-requisite: PSC 130 Minimum Grade of C.

PSC 500 Pub Admin-Org Theory Pub Mgmt 3 cr
A review and examination of the several principal, traditional, and contemporary theories of organization, policy, and administration. Field problems and case studies are stressed.

PSC 501 Public Administration 3 cr
The study of the implementation of public policy at the national, state and local levels, and the study of the planning, organization, and coordination of government operations. Pre-requisite: PSC 130 Minimum Grade of C.

PSC 510 Intergov-Interorg Relations 3 cr
A review of the political, fiscal, and administrative relationships between various levels of government in America. In addition, the emerging nexus to 3d sector non-profit organization will be examined.

PSC 511 Crim. Justice Admin. 3 cr
This course applies classical and modern management and organization theories to a broad range of institutions, actors, and agencies, including police, courts, and corrections, as well as drug traffickers, sexual offender treatment centers, and homeland security agencies.

PSC 520 Research Methods and Design 3 cr
Social science research methodologies will be used to help students develop skills for policy analysis and decision making in the public service. Stresses the understanding of research methods and data collection in a Public Administration setting. Theoretical development and elaboration, and an overview of the variety of research designs used in social science research will be included.

PSC 530 Quantitative Analysis 3 cr
Focus is on application of statistical analysis techniques to Public Administration problems and issues. Computer analysis and interpretation of descriptive statistics will be emphasized. Topics will include fundamentals of probability, sampling, hypothesis testing, point estimation, association, correlation, and multi variate analysis.

PSC 532 State and Local Government 3 cr
An overview of U.S. state and local government systems, including an analysis of the politics, public policy, and administration within the U.S. states and localities. Pre-requisite: PSC 130 Minimum Grade of C.

PSC 537 Legislative Process in the US 3 cr
Principles, procedures, and problems of law making, with special attention to the U.S. Congress.

PSC 540 Public Hum Resource Mgt 3 cr
This course will cover contemporary topics in public administration, including public-employee unionization, relevance of the traditional civil-service approach, the challenge of employee productivity and motivation, equal opportunity, and public service ethics.

PSC 541 Leadership Theory and Practice 3 cr
The course will provide the analytical and intellectual thought, careful examination and reflection of the core issues in the practice of leadership. Models and influence on leadership will be critically examined.
PSC 550  Managing the Public Budget  3 cr
This course emphasizes the political management and public-policy implications of budget reform. The conceptual framework for program and performance budgeting will be explored, as well as the increasing congressional role in federal budget policy.

PSC 560  Comparative Public Admin  3 cr
A study of the operation of government systems throughout the world—their history, features, similarities, and differences.

PSC 570  Administrative Law  3 cr
This course emphasizes the relationship between administrative processes of government and the legal system. Attention is given not only to the administrative process involving formal adjudication, rule making, and judicial review, but also to those processes involving formal and unreviewed discretionary action. Students propose legal resolutions to contemporary administrative issues.

PSC 572  Environmental Law  3 cr
This course will introduce the student to some of the fundamental concepts of environmental law. It will utilize the philosophy and history of environmental law as it has developed from the Common Law of England to provisions of a Municipal Code.

PSC 576  Adm Issues CJ Men Health  3 cr
An overview of the relevant federal and state laws, federal regulations, and court rulings that address the issues of criminal justice for preserving the rights of those citizens who suffer from mental illness.

PSC 580  Public Pol Analysis and Eval  3 cr
A practical introduction to policy and program evaluation including a general overview of conceptual frameworks by which evaluation are conducted and an examination of the various qualitative and quantitative techniques by which policy outcomes and programs are analyzed. Designed to develop skills necessary for conducting evaluations and assessing the validity and credibility of evaluations conducted by others.
Pre-requisite: PSC 520 Minimum Grade of B and PSC 530 Minimum Grade of B.

PSC 581  Public Policy and Aging  3 cr
This course examines government responses to the growing number of older Americans. Topics include retirements and pensions, health care, housing, social services, intergenerational issues, and policy advocacy of the elderly.
Pre-requisite: PSC 130 Minimum Grade of C.

PSC 582  Crim. Just. Policy Evaluation  3 cr
This course examines the most effective and commonly used forms of policy and program evaluation and applies them to criminal justice system. It explores policy and program evaluation related a number of subfields, including policing, drug policy, and gun control, recidivism, and police use of force.
Pre-requisite: PSC 520 Minimum Grade of C and PSC 530 Minimum Grade of C.

PSC 585  Health Policy  3 cr
This course focuses on two distinct aspects of American Health Policy. First, the policy making process is examined in the context of health care and the major decision making powers (Congress, presidency, bureaucracy, and special interests). Second, existing health care policies are examined with an emphasis on the implications for access, financing, and quality of care. Finally, existing U.S. health policies are compared and contrasted with those of similar and dissimilar political systems.

PSC 586  Health Administration  3 cr
Applications of management principles to health care organizations with a focus on governance and leadership, human resources, control systems, strategic planning, and accountability.

PSC 587  Health Politics & The Elderly  3 cr
This course focuses on the health policy process and issues impacting the elderly with particular attention given to the politics of legislation, financing mechanisms, and strategies for reform.

PSC 590  Special Topics -  3 cr
Study of a significant topic in Public Administration. May be repeated for credit when the content varies.

PSC 594  Dir St -  1 TO 6 cr
Under the guidance of a faculty member, student will pursue directed study of approved topics in public administration. For non-thesis students.

PSC 596  Prof St - Intern Publ Admin  3 TO 6 cr
Relates the participants' classroom studies to occupational and professional experiences in an approved public agency. Written reports required. May be taken for a total of nine hours. (For further details, see section on Internship.)

PSC 599  Thesis  3 TO 6 cr
Completion and oral defense of a master's thesis based upon original research. May be repeated for up to six hours credit. A minimum of six hours credit is required to meet degree requirements. Prerequisite: Approval of research prospectus including IRB or Animal Use and Care Committee approval if applicable.

Psychology (PSY)

PSY 120  Introduction to Psychology  3 cr
A survey of the basic theories, concepts, principles, and research findings in the field of Psychology. Core course.
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<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>PSY 121</td>
<td>Honors Gen Psychology - H</td>
<td>3 cr</td>
<td>This course will provide a survey of the basic theories, concepts, principles, and research findings in the field of Psychology. Along with the broad overview provided by the course, students will participate in a more in-depth examination of selected special topics (e.g., those topics generating controversy in the research community and in our society) as selected by the instructor. By contrast with the PSY 120 Introduction to Psychology course already being taught, the Honors General Psychology course will provide a more thorough coverage of selected topics. Prerequisite: Special permission.</td>
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<tr>
<td>PSY 220</td>
<td>Res Design and Analysis I</td>
<td>3 cr</td>
<td>Research methods in psychology with an emphasis on the experimental method. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 221</td>
<td>Research Desgn/Analysis I-Apps</td>
<td>1 cr</td>
<td>Laboratory in research methods in psychology with an emphasis on the experimental method. Fee. Co-requisite: PSY 220. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 210 Minimum Grade of D) or PSY 121 Minimum Grade of D and (EH 102 Minimum Grade of D or EH 105 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 250</td>
<td>Life Span Development</td>
<td>3 cr</td>
<td>An overview of human development from conception to death. Special emphasis will be placed on cognitive and social development. Core course.</td>
</tr>
<tr>
<td>PSY 270</td>
<td>Psy of Black Experience</td>
<td>3 cr</td>
<td>Theories and principles of psychology pertaining to the experience of black Americans. Includes the development of the black psychological perspective, African-American historical developments and philosophy, identity development and the determinants of the black personality, and contemporary issues in the black community.</td>
</tr>
<tr>
<td>PSY 290</td>
<td>Special Topics -</td>
<td>1 TO 3 cr</td>
<td>Selected topics in psychology. May be repeated for credit when course content varies for a total of 12 credit hours. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 310</td>
<td>Biological Psychology I</td>
<td>3 cr</td>
<td>An introductory survey of research and theory in neuroscience as it applies to the understanding of behavior. Focus will be on understanding basic mechanisms of neuron function and general coverage of topics such as sensory and motor systems, motivation and emotion, learning and memory, language and thinking, and mental disorders. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 317</td>
<td>Applied Behavior Analysis I</td>
<td>3 cr</td>
<td>An introduction to the principles of behavior intended as a prerequisite to the specific strategies and procedures practiced by behavior analysts. This course will present the historical and scientific foundations of behavior analysis as applied in educational and other human service settings. Pre-requisite: (PSY 120 Minimum Grade of C or PSY 121 Minimum Grade of C or PSY 210 Minimum Grade of C) and (PSY 220 Minimum Grade of C or PSY 222 Minimum Grade of C).</td>
</tr>
<tr>
<td>PSY 320</td>
<td>Res Design-Analysis II-W</td>
<td>3 cr</td>
<td>Experience in applying methodological and statistical concepts introduced in PSY 220 and ST 210, as well as instruction in additional topics such as research and analysis. The course will emphasize the use of computers in conducting behavioral research (e.g., literature searches, collecting data, analyzing data, writing reports). Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
</tr>
<tr>
<td>PSY 321</td>
<td>Research Desgn/Analysis II-App</td>
<td>1 cr</td>
<td>Laboratory in research methods in psychology with an emphasis on applying methodological and statistical concepts introduced in PSY 220 and PSY 320. Fee. Co-requisite: PSY 320. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 210 Minimum Grade of D) or PSY 121 Minimum Grade of D and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).</td>
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<tr>
<td>PSY 340</td>
<td>Abnormal Psychology</td>
<td>3 cr</td>
<td>Nature and development of deviant behavior. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 350</td>
<td>Child and Adolescent Dev</td>
<td>3 cr</td>
<td>The development and psychosocial aspects of childhood and adolescence. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 394</td>
<td>Directed Study</td>
<td>1 TO 3 cr</td>
<td>Specific topics and research findings introduced through the reading of appropriate professional and scientific literature. Requires special permission. May be repeated for a total of 8 credit hours. Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).</td>
</tr>
<tr>
<td>PSY 395</td>
<td>Psychology Practicum</td>
<td>1 TO 6 cr</td>
<td>Supervised experience in an area of psychology. May include supervised placement in an applied setting. May be repeated for a total of 12 credit hours. Pre-requisite: (PSY 120 Minimum Grade of C or PSY 121 Minimum Grade of C or PSY 210 Minimum Grade of C).</td>
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</table>
PSY 412 History-Systems Psy - W 3 cr
The historical foundations of modern psychology and the development of major theories in psychology.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PSY 414 Introduction to Clin Psych 3 cr
This course serves as a practical capstone for Psychology students interested in careers in professional Psychology. Through a series of lectures, readings, exercises, films, and demonstrations, this course will introduce student to the ways that clinical psychologists approach the conceptualization, assessment, diagnosis, and treatment of health problems. The course will focus on the scientific basis for the practice of clinical psychology.
Pre-requisite: PSY 120 Minimum Grade of D or EH 102 Minimum Grade of D or EH 105 Minimum Grade of D.

PSY 416 Cognition 3 cr
An overview of psychological research and theory in cognitive psychology. The course will emphasize how people gather, process, represent, and use information to guide thought and action. This course is an approved elective for students seeking gerontology certification.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D).

PSY 418 Applied Behav Analysis II-Meth 3 cr
Behavioral assessment techniques and operant and respondent methods for deceleration of inappropriate behavior will be covered. Operant methods for accelerating appropriate behaviors, teaching new behaviors, and maintaining behaviors will be covered. Data-based decision making strategies will be used in developing and altering individual programs.
Pre-requisite: PSY 317 Minimum Grade of C.

PSY 419 App Behav Analysis III-Adv App 3 cr
Behavioral assessment techniques and experimental designs for the evaluation of behavior change programs will be covered. Data-based decision making strategies for formative program evaluation and modification are also included.
Pre-requisite: PSY 417 Minimum Grade of C.

PSY 420 Psychology of Learning 3 cr
Theories, experimental findings, and methods of investigation in learning.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D).

PSY 425 Mental Health and Law 3 cr
Selected topics in psychology and criminal justice. An overview of the relevant federal and state laws, federal regulations and court rulings which address the issues of justice for preserving the rights of individuals with mental illness.
Pre-requisite: PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D.

PSY 428 Perception 3 cr
A critical analysis of the main theories and research trends in sensation and perception. This course will include computer simulations and demonstrations, and will also emphasize computer applications for data collection, data analysis, and for reporting results. This course is an approved elective for students seeking gerontology certification. Fee.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D) and (PSY 310 Minimum Grade of D or PSY 380 Minimum Grade of D).

PSY 435 Social Psychology 3 cr
A survey and analysis of major theoretical and experimental topics of interest in social psychology, such as how we perceive others, attitude, interpersonal attraction, aggression, prejudice and altruism.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).

PSY 440 Psychology of Personality 3 cr
A survey and critical analysis of major historical and current theories about personality. The course will also examine research relevant to the different approaches and consider various techniques of personality assessment.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).

PSY 456 Adult Development and Aging- 3 cr
The development and psychosocial aspects of adulthood and late life. This course is an approved elective for gerontology certification.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of C or PSY 210 Minimum Grade of D).

PSY 460 Industrial Psychology 3 cr
Application of psychological principles and techniques to business, industry, and government.
Pre-requisite: PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D.

PSY 465 Intro to Measurements-Tests 3 cr
Theories and principles of psychological testing.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (ST 175 Minimum Grade of D or ST 210 Minimum Grade of D).
PSY 470  Intellectual Disabilities  3 cr
The study of theories and research in intellectual disabilities and related areas.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).

PSY 475  Comparative Evolutionary Psy  3 cr
A critical analysis of the main theories and research trends in comparative and evolutionary psychology. This course is an approved elective for students seeking gerontology certification.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D).

PSY 480  Health Psychology - W  3 cr
Current theories, research and applications in health psychology.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

PSY 485  Psychology of Gender  3 cr
The study of psychological research on gender differences and theories regarding the origins of these differences.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).

PSY 490  Special Topics  1 TO 3 cr
Selected topics in psychology. May be repeated for a total of 12 credit hours when course content varies.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).

PSY 492  Seminar -  1 TO 3 cr
A survey of basic theories, concepts, principles, and research findings in a particular focal topic in psychology. Students will study topics in depth by reading and presenting research reports, review papers and book chapters, and through active in-class discussion of the reading materials. Requires permission of department chair. May be repeated up to 2 times when content varies for a total of 6 credit hours.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D).

PSY 494  Directed Studies -  1 TO 3 cr
Directed study and research. Requires special permission. May be repeated for a total of 8 hours.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D).

PSY 499  Honors Senior Thesis-H  3 TO 6 cr
Student conducts an independent research project under the supervision of a faculty sponsor. Recommended for psychology majors planning graduate school. Permission of department chair is required prior to registration. Requires GPA of 3.3 or higher. May be repeated for a total of 6 credit hours.
Pre-requisite: (PSY 120 Minimum Grade of D or PSY 121 Minimum Grade of D or PSY 210 Minimum Grade of D) and (PSY 220 Minimum Grade of D or PSY 222 Minimum Grade of D).

PSY 500  Proseminar in Psychology  1 cr
Research presentations will be given by faculty and advanced graduate students. In addition, discussion of project and thesis requirements and procedures will take place. Required of all students registered for PSY 500 , 502, and 503.

PSY 501  Research Design and Stats I  3 cr
Theories and principles of research design and elements of modern statistics. Introduction to computer programs for statistical analysis will be included. Fee.
Co-requisite: PSY 500

PSY 502  Research Design and Stats II  3 cr
Theories and principles of advanced research design and elements of modern statistics. The use of computer applications such as SPSS to analyze empirical data sets will be covered. Fee.
Co-requisite: PSY 500
Pre-requisite: PSY 501 Minimum Grade of B or PSY 521 Minimum Grade of B.

PSY 503  Quantitative Methods II  3 cr
Elements of modern statistics with emphasis on application to psychological research. Multivariate statistical techniques to include multiple regression, multivariate analysis of variance, discriminant, canonical, and factor analysis will be discussed. Fee.
Co-requisite: PSY 500
Pre-requisite: (PSY 502 Minimum Grade of B or PSY 522 Minimum Grade of B).

PSY 507  Professional Ethics Psychology  3 cr
This course provides instruction through readings, lecture, and case studies in the application of ethics in the professional practice of psychology. In addition, the course focuses on the philosophical foundations, professional identity, and standards of practice found in both clinical psychology and counseling psychology.
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<th>Course Code</th>
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<tr>
<td>PSY 510</td>
<td>Physiological Psychology</td>
<td>3 cr</td>
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<td>This course provides a foundation in the techniques of advanced psychophysiological methods. The course covers the history of psychophysiology, including the electrical properties of cells, and major organ systems, with particular emphasis on the electroencephalogram (EEG) and neuroimaging techniques. Students are introduced to the principles of psychophysiological recording, common applications of psychophysiology, safety and ethics in psychophysiological research, instrumentation, and research design issues in psychophysiology. Relevant statistical treatment of psychophysiological data will be discussed, including multiple regression, complex ANOVA, scaling of data, and non-parametric alternatives such as boot-strapping.</td>
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<tr>
<td>PSY 512</td>
<td>Adv History/Systems Psychology</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>An advanced course in the historical foundations of modern psychology and the development of major theories in psychology.</td>
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<tr>
<td>PSY 514</td>
<td>Learning</td>
<td>3 cr</td>
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<td>A survey of research and theory in learning.</td>
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<tr>
<td>PSY 516</td>
<td>Cognitive Psychology</td>
<td>3 cr</td>
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<td>An advanced survey of research and theory in cognitive psychology. Topics include pattern recognition, attention, memory, language processing, decision making, and problem solving. This course is an approved elective for students seeking gerontology certification.</td>
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<tr>
<td>PSY 520</td>
<td>Personality Res and Theory</td>
<td>3 cr</td>
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<td></td>
<td>A critical analysis and evaluation of major theories and current research trends in personality.</td>
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<tr>
<td>PSY 522</td>
<td>Soc &amp; Personality Psychology</td>
<td>3 cr</td>
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<td>This course provides a foundation for conducting quantitative research in personality and social psychology. Topics covered will include (a) measurement of personality and individual differences (e.g., narcissism, self-esteem), (b) measurement of cognitive and behavioral outcomes in laboratory and non-laboratory settings (e.g. decision-making, implicit cognitions), and (c) data analytic techniques (e.g. testing for mediation/moderation, structural equation modeling).</td>
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<tr>
<td>PSY 524</td>
<td>Lifespan Development</td>
<td>3 cr</td>
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<td>Analysis of theories, research methods, and major findings of sensory, perceptual, social, and cognitive changes across the lifespan, from infancy to late life. Research in social and cognitive development, including cognitive disabilities, the underlying mechanisms involved in thinking and learning processes, and age-related cognitive models are central to this course. <strong>This course is an approved elective for students seeking gerontology certification.</strong></td>
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<tr>
<td>PSY 528</td>
<td>Sensation and Perception</td>
<td>3 cr</td>
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<td>This course provides a multidisciplinary analysis of how the sensory systems analyze physical stimuli to support perception and successful actions. Consideration is given to how the anatomy and physiology of the major sensory systems extract information using low- and high-level mechanisms to create meaningful percepts. Other topics include psychophysics, comparative studies, communication, production and performance, face and object recognition, attention, and event perception.</td>
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<tr>
<td>PSY 530</td>
<td>Intro Appl Psychology &amp; Ethics</td>
<td>3 cr</td>
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<td></td>
<td>Theories, principles and techniques of interviewing, behavioral observation and classification of psychological disorders.</td>
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<tr>
<td>PSY 532</td>
<td>Psychopathology</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Current research and theoretical aspects of psychopathology in children and adults.</td>
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<tr>
<td>PSY 540</td>
<td>Psychometrics</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Theories and methods of test construction and principles of measurement and evaluation in the behavioral sciences.</td>
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<tr>
<td>PSY 542</td>
<td>Cognitive Assessment</td>
<td>3 cr</td>
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<td>Principals and methods of individual intelligence testing, including the administration of the Wechsler and the Stanford-Binet tests. Practical experience in the administration, interpretation and report writing of a psychological evaluation using intelligence tests. Pre-requisite: PSY 530 Minimum Grade of B and (PSY 540 Minimum Grade of B or PSY 571 Minimum Grade of B).</td>
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<tr>
<td>PSY 544</td>
<td>Practicum Assessment</td>
<td>3 cr</td>
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<td></td>
<td>Theory, development and interpretation of selected personality assessment instruments. Methods and procedures in administering and interpreting personality, aptitude and career interest tests. Pre-requisite: (PSY 540 Minimum Grade of B or PSY 571 Minimum Grade of B) and (PSY 542 Minimum Grade of B or PSY 575 Minimum Grade of B).</td>
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<tr>
<td>PSY 550</td>
<td>Evidenced Based Clin/Coun Prac</td>
<td>3 cr</td>
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<tr>
<td></td>
<td>Study of the theoretical and empirical foundations of the major systems of psychotherapeutic change.</td>
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</table>
PSY 552  Multicultural Issues in Psy  3 cr
This course will focus on theoretical models, research, techniques, and interventions for working with culturally diverse populations in various settings. Specific issues to be addressed include world views, acculturation and acculturative stress, prejudice and prejudice-reduction techniques, racial/ethnic identity, culture and assessment, and the nature of multicultural competence in Psychology. Issues related to ethnic and racial identity will form the primary focus; however, other types of diversity (e.g., religion, gender, sexual orientation, physically challenged) will also be considered.
Pre-requisite: (PSY 550 Minimum Grade of B or PSY 589 Minimum Grade of B) and PSY 506 Minimum Grade of B and PSY 530 Minimum Grade of B and (PSY 532 Minimum Grade of B or PSY 561 Minimum Grade of B).

PSY 554  Cognitive Behavior Therapy  3 cr
A follow up course to PSY 550, this course will survey theory, research and application of cognitive behavior therapy. Focus will be on treatment strategies and application to a variety of psychological disorders of adults and children.
Pre-requisite: PSY 530 Minimum Grade of B and (PSY 532 Minimum Grade of B or PSY 561 Minimum Grade of B) and (PSY 550 Minimum Grade of B or PSY 589 Minimum Grade of B).

PSY 556  Practicum  1 TO 3 cr
Supervised experience with adult and children clients. Includes case conference and seminars. May include supervised placement in an applied setting. May be repeated up to five times for a total of 18 credit hours.
Pre-requisite: (PSY 532 Minimum Grade of B or PSY 561 Minimum Grade of B) and (PSY 550 Minimum Grade of B or PSY 589 Minimum Grade of B).

PSY 558  External Practicum  3 TO 5 cr
Supervised placement in an applied setting. May be repeated four times for a total of 15 credit hours.
Pre-requisite: PSY 552 Minimum Grade of B and PSY 554 Minimum Grade of B.

PSY 570  Intel Disable/Autism Spec Dis  3 cr
A study of theories and research related to Intellectual Disabilities and Autism Spectrum Disorders.

PSY 572  Child Psychopathology  3 cr
The description and etiology of deviant behavior patterns in children and adolescents.
Pre-requisite: (PSY 532 Minimum Grade of B or PSY 561 Minimum Grade of B).

PSY 575  Comparative Psychology  3 cr
An in-depth analysis of the proximal and ultimate causes of animal and human behavior examined from the perspectives of comparative and evolutionary psychology, psychobiology and ethology. Relevant research in animal models of biological and cognitive systems, learning and motivation, lifespan development and related biopsychosocial factors will be included. ** This course is an approved elective for students seeking gerontology certification.

PSY 586  Cognitive Neuroscience  3 cr
This course includes an advanced and integrative study of the experimental study of cognition and neuroscience. Topics include sensation and perception, memory, learning, language, metacognition, intelligence, problem solving, decision making, mental imagery, consciousness, attention, and the development of cognition through the life span. Major theoretical perspectives and current research within the fields of cognition and neuroscience are discussed. This course also provides students with a basic understanding of the neural underpinnings of a variety of cognitive processes.

PSY 590  Sp Top in Psychology -  1 TO 3 cr
Selected topics in psychology. May be requested for credit when course content varies for a total of 12 credit hours.

PSY 594  Dir Individual Study  1 TO 3 cr
Individual study under the direction of a member of the graduate faculty. May be repeated for up to 9 hours credit.

PSY 598  Project in Psychology  1 TO 6 cr
Completion of a research project, program proposal, program evaluation, major literature review or other comparable experience under the direction of a member of the graduate faculty. IRB or Animal Use and Care Committee approval may be required for some projects. May be repeated for up to 6 hours credit. A minimum of 3 hours is required to meet degree requirements.

PSY 599  Thesis Research  1 TO 6 cr
Completion and oral defense of a master's thesis based upon original research. May be repeated for up to 9 hours credit. A minimum of 6 hours is required to meet degree requirements. Prerequisite: Approval of research prospectus including IRB or Animal Use and Care Committee approval if applicable.

Radiologic Sciences (RAD)

RAD 300  Clinical Education I  2 cr
Hospital-based laboratory allowing the student additional clinical experience in RAD 312 and RAD 304.
RAD 301  Clinical Education II  4 cr
Hospital-based laboratory allowing the student to obtain clinical experience in those areas presented in RAD 307.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C.

RAD 302  Clinical Ed III  3 cr
Hospital-based laboratory allowing the student additional clinical experience.

RAD 304  Patient Care & Ethics  3 cr
Basic knowledge concerning patient care and ethical situations with which the radiologic technologist must be familiar. Class time is allotted for the student to practice certain techniques pertinent to obtaining vital signs, handling of patients, sterile technique, tray setup, first-aid measures, and general operating room and bedside radiography procedures.

RAD 307  Osseous I  4 cr
This course includes the demonstration and practice in positioning and phantom radiography of the chest, general abdomino-pelvic viscera, and the upper and lower extremities to include shoulder and pelvic girdles.

RAD 308  Osseous II  4 cr
Continuation of RAD 307 to include the axial skeleton, sternum, sternoclavicular joints and introductory topics relating to special radiographic procedures.

RAD 309  Osseous III  3 cr
Continuation of RAD 308 to include demonstration and practice in positioning and phantom radiography of the cranium, facial bones, optic foramina, TMJs, orbits, overview of mastoids, stereoscopy, tomography, long bone measurements, foreign body localization and fetal imaging.

RAD 310  Radiation Biology  2 cr
A study of health physics and methods used to reduce exposure to personnel and patients in diagnostic and therapeutic radiology. The biological effects of ionizing radiation are stressed along with applied mathematical principles.

RAD 312  Princ of Radiographic Exposure  4 cr
A beginning study of the principles involved in image formation including exposure factors affecting image quality.

RAD 315  Contrast Media  2 cr
A detailed study of contrast media, preparation and administration, radiographic positions, technique, and anatomy and physiology of the organs studied.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C.

RAD 318  Radiologic Physics  4 cr
A study of the fundamentals of magnetism, basic electricity, x-ray machine circuitry, x-ray protection, and radiation physics, to give the student a basic understanding of the principles underlying the production of x-rays and their interaction with matter.
Pre-requisite: RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C and RAD 300 Minimum Grade of C.

RAD 320  Cross-Sectional Anatomy  2 cr
A study of cross-sectional anatomy as imaged in MRI and CT.

RAD 335  Pediatric-Geriatric Rad  1 cr
A detailed study of specialized equipment, accessories and positioning techniques used in pediatric and geriatric radiography.

RAD 403  Clinical Education IV  4 cr
Hospital-based laboratory allowing the student to obtain clinical experience in those areas presented in RAD 308 and RAD 310.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 300 Minimum Grade of C.

RAD 404  Clinical Education V  4 cr
Hospital-based laboratory allowing the student to obtain clinical experience.
Pre-requisite: RAD 403 Minimum Grade of C and RAD 411 Minimum Grade of C and RAD 415 Minimum Grade of C.

RAD 405  Clinical Education VI  4 cr
Hospital-based laboratory allowing the student to obtain clinical experience.
Pre-requisite: RAD 404 Minimum Grade of C.

RAD 407  Clinical Education I - PPC  6 cr
This is a hospital based laboratory allowing the student to gain additional clinical experience in general radiographic procedures. This course is designed for students who have previously completed the Radiologic Sciences program in Ultrasound or Radiation Therapy.

RAD 408  Clinical Education II - PPC  6 cr
This is a hospital based laboratory allowing the student to gain additional clinical experience in general radiographic procedures. This course is designed for students who have previously completed the Radiologic Sciences program in Ultrasound or Radiation Therapy. This course is a continuation of RAD 407.
Pre-requisite: RAD 407 Minimum Grade of C.
RAD 411 Survey of Pathology 4 cr
A general survey of diseases designed to acquaint the student with certain changes that occur in disease and their application to radiologic sciences.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C.

RAD 415 Diagnostic Imaging 4 cr
This course includes principles and clinical applications of image intensification, computer applications in radiology, CR, DR, IDDR, PACS, AEC function, magnification radiography, thermography, diaphanography and bone densitometry.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C.

RAD 417 Ultrasound Anatomy & Scanning-W 4 cr
This course will include lecture/clinical/laboratory demonstration and guidelines for the ultrasound evaluation of the abdomen, retro-peritoneum and superficial structures and also include a writing component.
Pre-requisite: EH 102 Minimum Grade of C.

RAD 418 Ultras Anat-Scan Tech-OB-GYN-W 3 cr
This course is a continuation of RAD 417 and is designed to provide the student with anatomy, pathology and scanning techniques of obstetrics and gynecology. It includes clinical and laboratory demonstrations. Special fee.
Pre-requisite: RAD 417 Minimum Grade of C.

RAD 421 Ultras Physics-Instrumentation 3 cr
A study of the basic physical principles and instrumentation of diagnostic ultrasound.

RAD 423 Ultrasound Clinical Educ I 5 cr
Hospital-based laboratory allowing the student to gain clinical experience in ultrasound procedures, with emphasis on abdominal exams.

RAD 424 Ultrasound Clinical Educ II 5 cr
Continuation of RAD 423 allowing the student to gain clinical experience in ultrasound procedures, with emphasis on OB/GYN exams.

RAD 425 Ultrasound Clinical Educ III 5 cr
A continuation of RAD 424 allowing the student to gain clinical experience in ultrasound procedures, with emphasis on superficial structures, pediatric scans, and ultrasound guided procedures.

RAD 427 Procedural Guidelines in Ultrasound 3 cr
This course will include a review of guidelines for ultrasound exams, ethics in ultrasound and preparation for the ultrasound registry. Assigned student papers and oral presentations addressing ultrasound topics are required.

RAD 430 Healthcare Communication 3 cr
This course will provide knowledge of information technology and applications of IT in the healthcare setting. Topics of discussion will include how to foster interdisciplinary communication, development of action plans for areas that are compliant/non-compliant with organizational objectives, and utilization of electronic or manual systems.
Pre-requisite: (RAD 300 Minimum Grade of C or RAD 104 Minimum Grade of C) and (RAD 307 Minimum Grade of C or RAD 131 Minimum Grade of C) and (RAD 310 Minimum Grade of C or RAD 265 Minimum Grade of C) and (RAD 312 Minimum Grade of C or RAD 101 Minimum Grade of C).

RAD 432 Healthcare Human Resource Mgmt 3 cr
This course will enable students to develop an effective recruitment and staffing program, implement a retention program, conduct staff performance evaluations, establish and develop processes to expand employee competence, implement a leadership development program, develop a succession plan and create an employee recognition program.

RAD 433 Health Care Financial Mgmt 3 cr
Course provides students with knowledge of both fiscal and asset management health care organization with tools and techniques to include health care accounting and financial statement, making major capital investments, determining cost and using cost information in decision making, and budgeting performance management.

RAD 435 Health Care Operations Mgt - W 3 cr
Provide knowledge to use surveys, focus groups, and interviews, use quality improvement methods, develop industry partnerships and develop new opportunities, develop marketing and public relations plans, develop policies and procedures to follow federal, state, and other regulatory guidelines, enforce policies and procedures with monitoring techniques, and develop a quality management program.

RAD 437 Image Analysis 3 cr
Student radiographs taken during the clinical periods will be viewed and critiqued within the classroom.
Pre-requisite: RAD 403 Minimum Grade of C and RAD 411 Minimum Grade of C and RAD 415 Minimum Grade of C.

RAD 440 Radiology Management Preceptor 1 cr
To achieve the aims of the Radiology Management program, students require experience in a variety of settings, in addition to learning theory content in their management courses. This course will provide a valuable component of student development by providing an opportunity to work with professional radiology managers/supervisors/administrators in the field of Radiology.
Pre-requisite: RAD 430 Minimum Grade of C and RAD 432 Minimum Grade of C and RAD 433 Minimum Grade of C and RAD 435 Minimum Grade of C.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>RAD 441</td>
<td>Clinical Education I</td>
<td>5 cr</td>
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<tr>
<td>RAD 442</td>
<td>Clinical Education II</td>
<td>6 cr</td>
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<tr>
<td>RAD 443</td>
<td>Clinical Education III</td>
<td>7 cr</td>
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<tr>
<td>RAD 446</td>
<td>Orientation to Oncology - W</td>
<td>3 cr</td>
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<tr>
<td>RAD 448</td>
<td>Radiation Therapy Physics</td>
<td>3 cr</td>
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<tr>
<td>RAD 450</td>
<td>Patient Care in Oncology</td>
<td>1 cr</td>
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<td>RAD 452</td>
<td>Prin Pract of Rad Oncology I</td>
<td>3 cr</td>
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<td>RAD 453</td>
<td>Prin Prac of Rad Oncology II</td>
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<tr>
<td>RAD 454</td>
<td>Quality Mgt In Rad Oncology</td>
<td>1 cr</td>
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<tr>
<td>RAD 455</td>
<td>Dosimetry and Tx Planning I</td>
<td>3 cr</td>
</tr>
<tr>
<td>RAD 456</td>
<td>Dosimetry and Tx Planning II</td>
<td>2 cr</td>
</tr>
<tr>
<td>RAD 457</td>
<td>Cancer Mgt in Oncology - W</td>
<td>3 cr</td>
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<tr>
<td>RAD 460</td>
<td>Vascular Radiograph I</td>
<td>4 cr</td>
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<tr>
<td>RAD 461</td>
<td>Vascular Radiography II</td>
<td>4 cr</td>
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<tr>
<td>RAD 462</td>
<td>Vascular Radiography III-W</td>
<td>4 cr</td>
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<tr>
<td>RAD 464</td>
<td>Computerized Tomography I</td>
<td>4 cr</td>
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RAD 441 **Clinical Education I**

Through structured sequential assignments in clinical education settings, concepts of team practice, patient-centered clinical practice, and professional development are presented. Course designed to provide development, application, analysis, integration, synthesis, and evaluation of concepts and theories in radiation therapy.

RAD 442 **Clinical Education II**

A continuation of RAD 441. Through structured sequential assignments in clinical education settings, concepts of team practice, patient-centered clinical practice, and professional development are presented. Course designed to provide development, application, analysis, integration, synthesis, and evaluation of concepts and theories in radiation therapy.

RAD 443 **Clinical Education III**

A continuation of RAD 442. Through structured sequential assignments in clinical education settings, concepts of team practice, patient-centered clinical practice, and professional development are presented. Course designed to provide development, application, analysis, integration, synthesis, and evaluation of concepts and theories in radiation therapy.

RAD 446 **Orientation to Oncology - W**

Examines Oncology terminology, concepts of diagnosis and treatment, orientation to equipment and procedures and the role of the radiation therapist. Ethical, legal and quality assurance concerns will also be discussed.

RAD 448 **Radiation Therapy Physics**

Processes in radiation production, interactions, detection, and measurement, units, calibration, are presented. Routine and emergency protection procedures for radiation-producing devices and radioactive sources are emphasized. Includes discussions on quality assurance methods, treatment unit calibration, dose monitoring, beam verification, and radiation protection for the patient, healthcare worker, and the public.

RAD 450 **Patient Care in Oncology**

Fundamentals of oncology patient care with emphasis on physical and psycho-social needs assessment, treatment and disease side-effect management, nutritional care and pain management.

RAD 452 **Prin Pract of Rad Oncology I**

A study of techniques used for simulation and treatment delivery. Includes general and site-specific instruction, with attention given to technical details aimed at optimizing the dose delivery planned during simulation and accomplished during treatment. Time will be dedicated to demonstration of techniques.

RAD 453 **Prin Prac of Rad Oncology II**

A study of techniques used for simulation and treatment delivery. Includes general and site-specific instruction, with attention given to technical details aimed at optimizing the dose delivery planned during simulation and accomplished during treatment. Time will be dedicated to demonstration of techniques.

RAD 454 **Quality Mgt In Rad Oncology**

Components of quality management in Radiation Oncology will be studied, to include quality control and assurance checks for the clinical aspects of patient care, medical records, treatment delivery and localization equipment and treatment planning equipment. The role of various team members in continuous quality improvement will be discussed as well as legal and regulatory implications. Pre-requisite: RAD 441 Minimum Grade of C and RAD 448 Minimum Grade of C and RAD 446 Minimum Grade of C and RAD 450 Minimum Grade of C and RAD 452 Minimum Grade of C.

RAD 455 **Dosimetry and Tx Planning I**

Content designed to examine factors that influence and govern clinical planning treatment. Encompasses isodose characteristics, contouring of relevant structures, dosimetric calculations, compensation, and clinical application of treatment beams. Optimal treatment planning is emphasized.

RAD 456 **Dosimetry and Tx Planning II**

A continuation of RAD 455. Content designed to examine factors that influence and govern clinical planning of patient treatment. Encompasses isodose characteristics, contouring of relevant structures, dosimetric calculations, compensation, and clinical application of treatment beams. Optimal treatment planning is emphasized.

RAD 457 **Cancer Mgt in Oncology - W**

This course examines special topics in Radiation Oncology and places emphasis on current literature related to various aspects of practice.

RAD 460 **Vascular Radiograph I**

Advanced practice in, and in-depth study of, the principles of vascular radiography. Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C.

RAD 461 **Vascular Radiography II**

Advanced practice in, and in-depth study of, the principles of vascular radiography. Pre-requisite: RAD 403 Minimum Grade of C and RAD 411 Minimum Grade of C and RAD 415 Minimum Grade of C and RAD 460 Minimum Grade of C.

RAD 462 **Vascular Radiography III-W**

Advanced practice in, and in-depth study of, the principles of vascular radiography. Pre-requisite: RAD 461 Minimum Grade of C.

RAD 464 **Computerized Tomography I**

Advanced practice in, and in depth study of, computerized tomography. Pre-requisite: RAD 300 Minimum Grade of C and RAD 304 Minimum Grade of C and RAD 307 Minimum Grade of C and RAD 310 Minimum Grade of C and RAD 312 Minimum Grade of C.
RAD 465  Computerized Tomography II  4 cr
Advanced practice in, and in-depth study of, computerized
tomography
Pre-requisite: RAD 403 Minimum Grade of C and RAD 411
Minimum Grade of C and RAD 415 Minimum Grade of C
and RAD 464 Minimum Grade of C.

RAD 466  Computerized Tomog III-W  4 cr
Advanced practice in, and in-depth study of, computerized
tomography.
Pre-requisite: RAD 464 Minimum Grade of C and RAD 465
Minimum Grade of C.

RAD 468  Magnetic Resonance Imaging I  4 cr
An in-depth study of the principles and clinical applications
of MRI.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304
Minimum Grade of C and RAD 307 Minimum Grade of C
and RAD 310 Minimum Grade of C and RAD 312 Minimum
Grade of C.

RAD 469  Magnetic Res Imaging II  4 cr
An in-depth study of the principles and clinical applications
of MRI.
Pre-requisite: RAD 468 Minimum Grade of C and RAD 469
Minimum Grade of C.

RAD 470  Magnetic Resonance Img III-W  4 cr
An in-depth study of the principles and clinical applications
of MRI.
Pre-requisite: RAD 468 Minimum Grade of C and RAD 469
Minimum Grade of C.

RAD 472  Mammography I  4 cr
Advanced practice and in-depth study of breast imaging
techniques.
Pre-requisite: RAD 300 Minimum Grade of C and RAD 304
Minimum Grade of C and RAD 307 Minimum Grade of C
and RAD 310 Minimum Grade of C and RAD 312 Minimum
Grade of C.

RAD 473  Mammography II  4 cr
Advanced practice and in-depth study of breast imaging
techniques.
Pre-requisite: RAD 403 Minimum Grade of C and RAD 411
Minimum Grade of C and RAD 415 Minimum Grade of C
and RAD 472 Minimum Grade of C.

RAD 474  Mammography III-W  4 cr
Advanced practice and in-depth study, of breast imaging
techniques.
Pre-requisite: RAD 472 Minimum Grade of C and RAD 473
Minimum Grade of C.

RAD 475  Advanced Modality Clinical A  2 cr
Advance practice in hospital based laboratory/clinical
settings. Clinical rotations will serve as the foundation for
acquiring the appropriate clinical skills. The completion of
assigned clinical rotations and clinical competencies are
essential to filling objectives.

RAD 476  Advanced Modality Clinical B  2 cr
Advance practice in an additional hospital based laboratory
clinical setting. Clinical rotations will serve as the foundation
for acquiring the appropriate clinical skills. The completion
of assigned clinical rotations and clinical competencies are
essentials to filling objectives.

RAD 477  Computed Tomography I  2 cr
Advance practice in, and in-depth study of, computerized
tomography

RAD 478  Computed Tomography II-W  2 cr
Continuation of RAD 477, with increased emphasis on 3-D
imaging, biopsies and advanced CT techniques.
Co-requisite: RAD 475
Pre-requisite: RAD 477 Minimum Grade of C and EH 102
Minimum Grade of C.

RAD 479  Computed Tomography III  2 cr
Advance practice in, and in-depth study of, computerized
tomography

RAD 480  Mammography I - W  2 cr
Lecture and discussion of breast imaging and includes the
history, scope of practice, introduction to MQSA, breast
cancer and early detection, epidemiology, patient care,
patient education and assessment.
Co-requisite: RAD 475
Pre-requisite: EH 102 Minimum Grade of C.

RAD 481  Mammography II  2 cr
This course is continuation of RAD 480 with increased
emphasis on quality assurance, mammographic
digital imaging, diagnostic procedures, and 3D breast
tomosynthesis.

RAD 482  Mammography III  2 cr
This course will include web enhanced lectures,
demonstrations and review of RAD 480 and RAD 481 with
increased emphasis on quality assurance and advanced
mammographic digital imaging.

RAD 483  Magnetic Resonance Imaging I  2 cr
An in-depth study of the principles and clinical applications
of MRI.

RAD 484  Magnetic Reson Imaging II - W  2 cr
This course introduces the basic principles of MR safety
and covers the basic concepts of patient management.
Educating patients and ancillary staff on magnet safety
also is presented. Patient and magnet-related emergencies
represent a unique situation to an MR tech.
Co-requisite: RAD 475
Pre-requisite: EH 102 Minimum Grade of C.

RAD 485  Magnetic Resonance Imaging III  2 cr
A continuation of RAD 484 with additional emphasis on
instrumentation, abdominal, extremity and joint procedures.
RAD 486  Vascular Radiography - W  2 cr
Advanced practice and in-depth study of the principles of vascular radiography with writing component.
Co-requisite: RAD 475

RAD 487  Vascular Radiography II  2 cr
Advanced practice and in-depth study of the principles of vascular radiography, with increased emphasis on digital radiography as applied to vascular procedures.

RAD 488  Vascular Radiography III  2 cr
Advanced practice and in-depth study of the principles of vascular radiography, with increased emphasis on vascular procedures.

RAD 490  Special Topics  1 TO 3 cr
Selected topics in Radiological Sciences. Students can increase knowledge in specific areas of radiological sciences, and also use this course to gain extra credit hours to complete their baccalaureate degree.

RAD 491  Prof. Radiological Practice  6 cr
A bridge course for certified radiographers to transition from Radiographer to BS program.

RAD 494  Directed Independent Study  2 cr
A comprehensive registry review to include written assignments and a presentation.

RAD 496  Radiologic Sci Research I-W  1 cr
Writing intensive course that prepares students to perform a research project in one of the imaging modalities.
Pre-requisite: EH 102 Minimum Grade of C.

RAD 497  Rad Science Research II  1 cr
Continuation of RAD 496. Students will design and perform a research project.
Pre-requisite: RAD 496 Minimum Grade of C.

RAD 499  Senior Honors Project - H - W  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project relevant to the field of Radiologic Sciences study that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty members chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to 6 credit hours. Prerequisite: Permission of the department chair and completion of an approved project prospectus.
Pre-requisite: RAD 403 Minimum Grade of C or RAD 423 Minimum Grade of C or RAD 441 Minimum Grade of C or RAD 460 Minimum Grade of C or RAD 464 Minimum Grade of C or RAD 468 Minimum Grade of C or RAD 472 Minimum Grade of C.

Reading Instruction (RED)

RED 110  Effect Read-Lang-Study Skills  3 cr
A laboratory experience to increase facility in reading, language and study skills.

RED 330  Found of Read Instruction - W  3 cr
A course to orient the student to fundamentals in the teaching of reading and provides practice in basic skills.

RED 331  Teaching Reading  3 cr
A course focusing on methodology, materials, and techniques for developing systematic instruction and diagnosis appropriate for early childhood and elementary children. This course has a required field experience.
Co-requisite: EEC 335, EEC 336, EEC 337, EEC 345
Pre-requisite: RED 330 Minimum Grade of C and EEC 346 Minimum Grade of C and RED 333 Minimum Grade of C and EEC 332 Minimum Grade of C.

RED 333  Literature for Children - W  3 cr
A course for the selection and use of literature based on the interests, abilities, and needs of children from prekindergarten through the elementary school. Particular emphasis on creative ways of sharing books with children. This course has a required field experience.
Co-requisite: RED 330

RED 334  Lit for the Young Child - W  3 cr
A survey course dealing with methods of writing literary materials with children in preschool through the primary grades. It is designed to assist those who wish to become widely acquainted with books and related materials for today’s young children.

RED 348  Lang Dev in Early Childhood - W  3 cr
An introduction to speech and language development birth through the primary grades and teaching practices that support language and literacy development. Includes discussion of cultural and developmental factors that influence language development and appropriate methods for helping young children acquire language and literacy skills.

RED 352  Literature for Adolescents  3 cr
Discussion and evaluation of literature for students in grades 7 through 12 with extensive reading, listening, and viewing of materials.

RED 451  Content Area Literacy - W  3 cr
Methods and materials in the teaching of reading. Development of effective study and skills at the secondary level is stressed.
Pre-requisite: SED 340 Minimum Grade of C and SED 341 Minimum Grade of C. SED 341 can be taken concurrently with this course.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED 458</td>
<td>Crit Read in Content Field - W</td>
<td>3 cr</td>
<td>An examination of non-fiction (and some fiction) which emphasizes critical reading skills. Various types of prose will be considered including that found in textbooks, newspapers and other periodicals, popular fiction, and non-fiction.</td>
</tr>
<tr>
<td>RED 530</td>
<td>Crnt Approach Read Writing Ins</td>
<td>3 cr</td>
<td>Intensive training and modeling in the theories and practices in the teaching of reading and writing with an emphasis on writing theory and practice.</td>
</tr>
<tr>
<td>RED 531</td>
<td>Trends-Practices Tchg Reading</td>
<td>3 cr</td>
<td>Begins with in-depth study of the nature of reading as a process and its place in the total school program and extends through assessments, methods, materials, and personalized procedures for pupils and teachers. Pre-requisite: EDU 330 Minimum Grade of C.</td>
</tr>
<tr>
<td>RED 533</td>
<td>Diag-Corr Reading Disabilities</td>
<td>3 cr</td>
<td>First, an intensive study of steps in the diagnosis of reading disabilities; second, a survey of corrective and remedial techniques for eliminating the difficulties; the third, application of diagnostic and instructional techniques to specific type of disabilities. Pre-requisite: RED 531 Minimum Grade of B.</td>
</tr>
<tr>
<td>RED 534</td>
<td>Remed-Clinic Proced in Reading</td>
<td>3 cr</td>
<td>A practicum in remediating reading disabilities. Each student receives close supervision in work with actual cases at varying disabilities levels. Pre-requisite: RED 533 Minimum Grade of B.</td>
</tr>
<tr>
<td>RED 541</td>
<td>Literacy in the Content Area</td>
<td>3 cr</td>
<td>This course includes the methods and materials for literacy-based instruction in the content areas. The incorporation of literacy-based activities such as reading, writing, and thinking; and the use of strategies to promote student comprehension are emphasized. Prerequisite: Admission to teacher education program.</td>
</tr>
<tr>
<td>RED 544</td>
<td>Wrtg Process Skls Read Writing</td>
<td>3 cr</td>
<td>Intensive writing applications with an emphasis on the writing process, action research, and the reading and discussion of reading and writing pedagogy and research.</td>
</tr>
<tr>
<td>RED 545</td>
<td>Lit for Children - Adolescents</td>
<td>3 cr</td>
<td>Provides a comprehensive survey of books written for children and adolescents, and makes appropriate interspersions of periodicals and other media. Through varied class activities, with emphasis on techniques for encouraging literary enjoyment, the student will increase skills in making children's literature an integral part of the school curriculum.</td>
</tr>
<tr>
<td>RED 547</td>
<td>Lit Early Childhood Classroom</td>
<td>3 cr</td>
<td>Provides a comprehensive survey of books written for children in the pre K-3 classroom, and incorporates periodicals, media and technology appropriate for teaching young children. A variety of class activities intended to motivate and encourage children to become lifelong readers is included.</td>
</tr>
<tr>
<td>RED 548</td>
<td>Literacy Coaching</td>
<td>3 cr</td>
<td>Includes an in-depth study of coaching techniques, specifically the role of coaching in the school setting. This course includes strategies for encouraging teachers to engage in the coaching process, coaching teachers to meet the literacy needs of their students, as well as providing school-based professional development and maximizing moments with struggling readers. Pre-requisite: RED 531 Minimum Grade of B.</td>
</tr>
<tr>
<td>RED 557</td>
<td>Practicum in Reading Education</td>
<td>1 TO 9 cr</td>
<td>Experiences in working in the area of reading instruction and/or diagnosis under the supervision of a reading teacher or supervisor and a college supervisor.</td>
</tr>
<tr>
<td>RED 560</td>
<td>Materials Workshop -</td>
<td>3 cr</td>
<td>A topical workshop in which participants have experiences in creating, designing, constructing and using instructional materials and activities. This work will emphasize reading and language arts. No more than 6 hours can be applied toward a degree program. Prerequisite: Permission of instructor.</td>
</tr>
<tr>
<td>RED 590</td>
<td>Sp Top -</td>
<td>3 TO 6 cr</td>
<td>Guided investigation of topics in reading education, such as curriculum revision, course or program design, newly evolved trends in reading education, and implications of research in reading education. No more than 6 hours can be applied toward a degree program.</td>
</tr>
<tr>
<td>RED 594</td>
<td>Dir St - Research</td>
<td>1 TO 3 cr</td>
<td>Students explore through directed study research problems and issues of special interest or significance in reading education. No more than 3 hours of any departmental 594 courses can be applied toward a degree program. Prerequisite: Permission of department chair.</td>
</tr>
<tr>
<td>RED 595</td>
<td>Internship in Reading Educ</td>
<td>1 TO 9 cr</td>
<td>The internship is a supervised learning experience in a work setting similar to that in which an educator will eventually be employed. The internship provides students with an opportunity to apply the theories and concepts learned during the graduate program. Pre-requisite: PRAXIS-Reading Specialist 164 and RED 533 Minimum Grade of B and RED 534 Minimum Grade of B.</td>
</tr>
<tr>
<td>RED 599</td>
<td>Thesis</td>
<td>1 TO 9 cr</td>
<td>A student selects a project, study, or investigation which is related to reading education. The project will form the basis for the thesis. A thesis committee will provide direction during the investigation and during the writing of the thesis.</td>
</tr>
<tr>
<td>RED 611</td>
<td>Theor Lang Dev Tchg Reading</td>
<td>3 cr</td>
<td>Emphasizes theories of language acquisition and development. Includes linguistics, language development of the culturally different child, and application of theory to classroom practices in reading and related areas. Requires special permission.</td>
</tr>
</tbody>
</table>
RED 612  Socio Influences in Rdg Instr  3 cr
Focuses upon the history of reading instruction, sociological factors influencing reading, reading in relation to other media of communication, and ways of applying these findings in classroom and clinical practice. Requires special permission.

RED 613  Admn and Supv the Rdg Program  3 cr
Analyzes and interprets administrative and supervisory roles and functions as they relate to the total school program, elementary through high school. Stress is upon facilitating and enhancing all aspects of the program. Requires special permission.

RED 615  Diag - Rem Severe Rdg Disab  3 cr
Provides laboratory experiences in studying severe cases of reading disabilities and in developing plans and procedures for their remediation. Requires special permission.

RED 630  Psy Factors in Tchg Reading  3 cr
Relates pertinent psychological concepts and principles to (1) current definitions of the reading process, (2) methods of teaching, and (3) special procedures for reluctant and disabled readers. The student may apply these concepts and principles in regular or laboratory settings.

RED 640  Research in Reading  3 cr
A critical analysis and evaluation of the significant research studies in reading from which reading concepts emerge and from which implications for teaching and further research may be drawn.

RED 648  Literacy Coaching Teacher/Ldrs  3 cr
A purpose of this course is to prepare professional educators through teaching, research, and service to become committed to life-long learning and to facilitate the process of building better communities. Students will demonstrate best educational practices and professional dispositions and will learn how to create a positive, motivational learning environment in schools while recognizing, appreciating, and including diverse learners and perspectives. Additionally, students are expected to demonstrate satisfactory skills in curriculum leadership; to engage in action research related to schools; to engage in literacy coaching; to address current family, community, regional, and national issues related to scholastic achievement, and to use tenets of instructional leadership to guide teachers and other professionals toward improving student achievement.

RED 690  Sp Top -  3 cr
Guided investigation of topics in reading education such as curriculum revision, course or program design, newly evolved trends in reading education, and implications of research in reading education.

RED 694  Dir St - Research  1 TO 3 cr
Students explore through directed study problems and issues of special interest or significance in reading education. No more than 3 hours of any departmental 694 courses can be accepted toward a degree program. Prerequisite: Permission of department chair.

RED 699  Research Project  1 TO 3 cr
A supervised research project, study, or investigation in reading. Student will conduct an investigation, and apply concepts and skills learned during the sixth-year program. May be taken more than one semester. Prerequisite: Permission of department chair. Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

Rehab Sci Occupational Therapy (RSO)

RSO 510  Occupational Therapy Foundatio  3 cr
This course is an introduction to the profession of occupational therapy including documents, terminology, professional behaviors, and occupational therapy settings and common interventions.

RSO 511  Human Motion and Movement Lab  2 cr
This course is a study of structures and functions of the human body with emphasis on biomedical functions.

RSO 512  Environmental Adapt and Rehab  3 cr
This course is an introduction to rehabilitation technological and environmental adaptations to increase, maintain, or improve functional capabilities of individuals with disabilities.

RSO 513  Neurological and Sensorimotor  4 cr
Occupational Therapy evaluation and intervention for person with selected developmental and acquired impairments and disabilities affecting self-care skills.

RSO 520  Rehabilitation  3 cr
Occupational Therapy evaluation and interventions for person with selected developmental and acquired impairments and disabilities.

RSO 521  Neurological and Sensorimotor  3 cr
This course will cover evidence-based OT evaluation and interventions for selected common pediatric conditions.

RSO 522  Biomedical Functions and Inter  3 cr
This course will provide instruction on common upper extremity conditions and interventions for persons with acquired impairments and disabilities that impact daily life skills, work, and IADLs. Emphasis will be placed on therapeutic interventions that emphasize problem-solving, critical reasoning, and occupational performance and include orthotic intervention strategies.
RSO 523  Rehabilitation and Aging Adult  3 cr  
This course will explore the typical aging process, health promotion, and OT evaluation and evidence-based interventions for this population.

RSO 530  Evidence-Based Clinic Learning  3 cr  
An introduction to critical analysis of scientific literature, application of statistical methods and scholarly writing and presentation.

RSO 532  Psychosocial Occupational Ther  3 cr  
This course will explore best practice evidence-based OT evaluation and interventions to address psychosocial needs of clients and populations. This course counts toward the Rehabilitation Sciences in Occupational Therapy Master’s Degree but does not count towards the Master of Science in Occupational Therapy degree.

Rehab Sci Speech Therapy (RST)

RST 521  Advanced Speech Science  3 cr  
This survey course covers physical and acoustic properties of speech perception and speech production. Instrumental measurement and analysis of the physical and acoustic properties of speech perception and production will be addressed.

RST 535  Pediat Speech & Lang Disorders  3 cr  
This survey course covers terminology, assessment and intervention for children from birth to age 21 years who present with spoken and written language disorders, including language impairment associated with other developmental disabilities, in particular, autism spectrum disorders. Additionally, one unit is speech therapy services for children and adults who present with fluency disorders/stuttering.

RST 540  Clinical Phonetics  2 cr  
This course will study the dynamics of speech sound production, and provide the knowledge and skills for transcription and analysis of normal and disordered sound production.

RST 541  Ped Sp Sound Disorders  2 cr  
Study of speech-sound production in children emphasizing disorders with organic (including cleft/resonance) and functional bases (i.e., phonological impairments) and childhood apraxia of speech. In addition to addressing the assessment and treatment of pediatric speech sound disorders, students acquire knowledge of speech perception, production, and typical acquisition for English speakers and crosslinguistically.

RST 551  Voice and Resonance Disorders  3 cr  
This course focuses on the study of normal mechanisms, etiologies, pathologies, symptoms, diagnostic processes, and treatment methodologies associated with voice and resonance disorders across the lifespan.

RST 565  Neuromotor Disorders of Comm  3 cr  
This course will address neuroanatomy and neuropathology of structures responsible for speech production. Students will learn how to assess and manage motor speech disorders. This course counts toward the Rehabilitation Sciences in Speech-Language Pathology Master’s degree but does not count toward the Master of Science in Speech-Language Pathology degree.

RST 566  Aphasia & Neuro Lang Disorders  3 cr  
This course will provide the requisite knowledge for understanding, assessing, and treating language impairments associated with damage to the left or right hemisphere. Specifically, students will learn about the neural substrates for language; language assessment principles and procedures; and the nature and treatment of aphasia and right hemisphere disorders. This course counts toward the Rehabilitation Sciences in Speech-Language Pathology Master’s degree but does not count toward the Master of Science in Speech-Language Pathology degree.

RST 567  Acq Cognitive Comm Disorders  2 cr  
This course will provide the requisite knowledge for understanding, assessing, and treating cognitive-communication impairments in adults with acquired cognitive-communication disorders. Specifically, students will learn about the neural substrates for cognition; cognitive assessment principles and procedures; and the nature and treatment of disorders such as traumatic brain injury and dementia. This course counts toward the Rehabilitation Sciences in Speech-Language Pathology Master’s degree but does not count toward the Master of Science in Speech-Language Pathology degree.

RST 568  Dysphagia  3 cr  
This course will address healthy and disordered swallowing function across the lifespan. Students will learn anatomy and physiology of the swallowing mechanism, how to assess swallowing function, and how to manage swallowing disorders. This course counts toward the Rehabilitation Sciences in Speech-Language Pathology Master’s degree but does not count toward the Master of Science in Speech-Language Pathology degree.
RST 580  Clinical Methods & Observation  1 TO 3 cr
Introduction to the clinical setting for persons interested in working with individuals with communication impairments but who will not be seeking ASHA certification. Instrumentation, procedures and approaches to assessment and intervention will be discussed. General guidelines for developing goals and treatment plans will be assessed through written documentation submission. Observation of clients with communication and swallowing disorders, both in the clinical setting and online is a primary part of this course.

RST 588  Audiology for Speech-Lang Path  3 cr
This interprofessional education (IPE) course will address the foundational knowledge and skills necessary for members of interprofessional healthcare teams working with individuals with communication disorders. Scope of practice, screenings across the life span, referrals, report literacy, and co-management of services to children and adults with a variety of communication disorders will be discussed.

Religion (REL)

REL 100  Intro to the Study of Religion  3 cr
As a general introduction to the academic study of religion, REL 100 examines the function of religion in relation to human beliefs, social practices, and culture in general. The course surveys a broad number of important debates in the history of religious studies, such as the definition of religion, the insider/outsider problem, theories on the origins of religion, the comparison of religions, religion's psychological, sociological, and political functions, and the manner in which human communities authorize systems of behavior.

REL 200  Old Testament/Hebrew Bible  3 cr
An introduction or survey of the literature and social world of the Old Testament/Hebrew Bible. As a way of further illuminating these materials, attention will also be given to the history and religion of Israel as well as the other peoples of the ancient Near East. Fulfils the General Education Requirement.

REL 201  Survey of the New Testament  3 cr
This course is an introductory survey of the New Testament, including the life and ministry of Jesus Christ, apostolic history, related Greco-Roman history and archeology, principal critical issues, and the unity and diversity of New Testament theology. Fulfils the General Education Requirement.

REL 242  Western Philosophy: Medieval  3 cr
A survey of Medieval Western Latin, Jewish, and Islamic philosophers. Identical with PHL 242. Credit cannot be received for both REL 242 and PHL 242.

REL 290  Special Topics -  3 cr
Different themes and issues of significance in religion will be studied as announced.

REL 310  Classical Mythology  3 cr
Through the disciplines of English and Philosophy, this course will provide an introduction to myths and to the literature that recounts the myths, legends, and folktales of ancient Greece and Rome. This course will also look at how different writers treat the material and why their treatments vary. Cross-listed with EH 310, PHL 310 and CLA 310. Credit cannot be received for both REL 310 and either EH 310 or PHL 310 or CLA 310. Pre-requisite: (ACT English 27 or SAT Critical Reading 610 or University - EH101 Exempt P or EH 101 Minimum Grade of C or EH 110 Minimum Grade of D or EH 190 Minimum Grade of D or USA 010 Minimum Grade of S) and (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

REL 331  History of England to 1603  3 cr
The history of England from the Roman occupation to the Age of Tudors. Identical with HY 331. Credit cannot be received for both REL 331 and HY 331.

REL 343  Witchcraft and Magic  3 cr
The history of beliefs and practices concerning witches, magic, and witch-hunting in Medieval and Early Modern Europe. Identical with HY 343. Credit cannot be received for both REL 343 and HY 343.

REL 347  The Holocaust  3 cr
The history of the systematic mass murder of Europe's Jews and other groups by Nazi Germany during World War II. Cross-listed with HY 347. Credit cannot be received for both REL 347 and HY 347.

REL 351  Philosophy of Religion - W  3 cr
Investigates the nature of religion, including religious experience, religious language, arguments for the existence of God, and the problem of evil. Identical with PHL 351. Credit cannot be received for both REL 351 and PHL 351. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

REL 352  World Religions  3 cr
This course is an introduction to the religions of the world. It is divided into three basic units: Indigenous Religions (of Africa, North America, and Oceania); Eastern Religions (Hinduism, Buddhism, Daoism, Confucianism, Jainism) and Western Religions (Judaism, Christianity, Islam). The emphasis is on grasping the core principles of each tradition, seeing the ways in which religion meets basic human needs, and religion as a cultural artifact that borrows, adapts, and changes over time. Course is identical with PHL 352 and SY 352. Credit cannot be received for both REL 352 and PHL 352 or SY 352.

REL 353  Reformation Europe 1300-1520  3 cr
The role of religious change in the 16th and 17th centuries. Identical with HY 353. Credit cannot be received for both REL 353 and HY 353.
### REL 354 Philosophies of India 3 cr
Introduces the major religions and philosophies of India by way of the classical Realist/Antirealist debate in India. Study of the major religious doctrines of theistic and non-dualist Vedanta, Buddhism, and Jainism, and their philosophical articulation in the Nyaya, Advaita Vedanta, Madhyamaka, and other schools. Identical with PHL 354. Credit cannot be received for both REL 354 and PHL 354.

### REL 355 Chinese Philosophy 3 cr
Introduces the major classical religious and philosophical systems of China by way of an examination of early Confucianism, Mohism, Yangism, Legalism, Taoism, and Chinese Buddhism. Particular emphasis will be placed upon the role of these schools in the development of Chinese religion, morality, and political organization. Identical PHL 355. Credit cannot be received for both REL 355 and PHL 355.

### REL 364 Islamic Civilization to 1453 3 cr
This course will cover the political, economic, social, and cultural history of Islamic Civilization from its beginnings in the Arabian Peninsula in the sixth century to the Ottoman conquest of Constantinople in 1453. Cross-listed with HY 364. Credit cannot be received for both REL 364 and HY 364.

### REL 365 Islamic Civilization 1465 - W 3 cr
This course will cover specific topics in the history of Islamic civilization. Prerequisite: Junior or Senior status. Cross-listed with REL 365. Credit cannot be received for both HY 365 and REL 365.

### REL 373 Religion in American History 3 cr
Examines the role of religion in United States history from the colonial era to the present. Identical with HY 373. Credit cannot be received for both REL 373 and HY 373. Pre-requisite: (EH 102 Minimum Grade of C or EH 105 Minimum Grade of C).

### REL 390 Special Topics - 3 cr
Different figures or topics of significance in religion will be studied as announced. May be repeated, when content varies, for a total of six hours.

### REL 420 Sociology of Religions 3 cr
An analysis of religion as a social institution with emphasis on modern western societies. Topics include the functions of religion for society and individuals, changing patterns of religious belief and practice and the relationship between religion and other social institutions. Identical with SY 420. Credit cannot be received for both REL 420 and SY 420. Pre-requisite: SY 109 Minimum Grade of C.

### REL 465 Studies of HY of Islamic Civ 3 cr
This course will cover specific topics in the history of Islamic civilization. May be repeated for credit when content varies. Prerequisite: Junior or Senior status. Cross-listed with HY 465. Credit cannot be received for both REL 465 and HY 465.

### REL 492 Seminar - 3 cr
An investigation of issues and concepts in religion for advanced undergraduates and graduate students. May be repeated, when content varies, for a total of six hours.

### REL 494 Directed Studies - 1 TO 3 cr
Directed research in religion under the guidance of a member of the department. Credit according to the magnitude of the individual project. May be repeated, if content varies, for a total of three hours. Prerequisites: Student in Department conferring a Graduate Degree (hence not open to Philosophy majors in any Concentration in Philosophy.)

### REL 499 Honors Thesis - H - W 3 TO 6 cr
Extended research paper prepared under the direction of thesis advisor plus two-person committee selected by advisor in consultation with student. Prerequisites: The student must have developed a proposal for the thesis in consultation with the advisor, and received permission for the work from the committee. In addition, the student must be a senior major or minor, have completed the Common Core, and have at least a 3.3 GPA in the Religion Concentration of the Philosophy major. Credit for this course is only given as an addition to the hours required for the major. Pre-requisite: (PHL 120 Minimum Grade of D and PHL 240 Minimum Grade of D and PHL 245 Minimum Grade of D and PHL 321 Minimum Grade of D and PHL 461 Minimum Grade of D) and (PHL 310 Minimum Grade of D or REL 310 or CLA 310 Minimum Grade of D).

### REL 594 Directed Studies 3 cr
Directed research in philosophy under the guidance of a member of the department. May be repeated, if content varies, for a total of six hours. Prerequisite: Graduate Student in Department conferring a Graduate Degree (hence not open to Philosophy majors in any Concentration in Philosophy.)

### Secondary Education (SED)

### SED 340 Fundamentals of Teaching - W 3 cr
Theory and practice of planning for instruction. Conducted as a system for individually guided mastery.

### SED 341 Teaching Skills - W 3 cr
Study and practice of selected instructional skills and classroom management focusing on middle level education and the transition to secondary education. Prerequisites: Junior standing and admission to candidacy. Pre-requisite: SED 340 Minimum Grade of C and (RED 351 Minimum Grade of C or RED 451 Minimum Grade of C) and (EPY 455 Minimum Grade of C or EPY 355 Minimum Grade of C) and (SED 453 Minimum Grade of C or SED 454 Minimum Grade of C or SED 456 Minimum Grade of C or SED 457 Minimum Grade of C). SED 351 and RED 451 and EPY 455 and EPY 355 and SED 453 and SED 454 and SED 456 and SED 457 can be taken concurrently with this course.
SED 342  Secondary Field Experience  1 cr
Supervised practice in teaching curriculum areas in middle and high school classroom settings during the semester in which block courses are taken.
Pre-requisite: SED 340 Minimum Grade of C.

SED 350  Intro to Teaching-Middle Sch  3 cr
A study of the concerns of pre-service middle school teachers, including program development, characteristics of the middle- school learners, nature of student-oriented instruction, and facilitation of learning of exceptional youth within the regular learning groups. Prerequisite: Junior standing.

SED 453  Tch Lang Subj Sec Sch  3 cr
Assists the student in organizing materials and in developing methods of teaching language subjects in secondary schools. Offered in Fall Semester only. Prerequisites: Admission to candidacy, completion of two-thirds of teaching field(s), and SED 340 or SED 555.
Pre-requisite: SED 340 Minimum Grade of C or SED 555 Minimum Grade of B.

SED 454  Tch Math Secondary Schools  3 cr
Assists the student in organizing materials and in developing methods of teaching mathematics in secondary schools. Offered in Fall Semester only. Prerequisites: Admission to candidacy, completion of two-thirds of teaching field, and SED 340 or SED 555.
Pre-requisite: SED 340 Minimum Grade of C or SED 555 Minimum Grade of B.

SED 455  Tch Music in Secondary Sch  3 cr
Assists the student in organizing materials and in developing methods of teaching music in secondary schools. Offered in Fall Semester only. Prerequisites: Admission to candidacy, completion of two-thirds of teaching field, and SED 340 and 341 or SED 555 and 559.
Pre-requisite: (SED 340 Minimum Grade of C and SED 341 Minimum Grade of C) or (SED 555 Minimum Grade of B and SED 559 Minimum Grade of B).

SED 456  Tch Science in Secondary Sch  3 cr
Assists the student in organizing materials and in developing methods of teaching science in secondary schools. Offered in the Fall Semester only. Prerequisites: Admission to candidacy, completion of two-thirds of teaching field, and SED 340 or SED 555.
Pre-requisite: SED 340 Minimum Grade of C or SED 555 Minimum Grade of B.

SED 457  Tch Social Studies in Sec Sch  3 cr
Assists the student in organizing materials and in developing methods of teaching social studies in secondary schools. Offered in Fall Semester only. Prerequisites: Admission to candidacy, completion of two-thirds of teaching field, and SED 340 or SED 555.
Pre-requisite: SED 340 Minimum Grade of C or SED 555 Minimum Grade of B.

SED 459  Creative Exper in Oral Lang  3 cr
Background in the theory and function of oral language, and techniques for developing oral and dramatic communicative skills. Emphasis will be on everyday oral language, rather than on formal speech or theater.

SED 463  Stu Tchg Middle School  9 TO 12 cr
Observation and supervised teaching in the middle schools with opportunity for study and discussion of the problems and issues encountered. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Prerequisite: Appropriate methods course

SED 464  Stu Tchg in High School -  9 TO 12 cr
Observation and supervised teaching in high school with opportunity for study and discussion of the problems and issues encountered. Students will be placed with person holding a valid teaching certificate in the appropriate field.
Pre-requisite: SED 340 Minimum Grade of C and SED 341 Minimum Grade of C and (SED 453 Minimum Grade of C or SED 454 Minimum Grade of C or SED 456 Minimum Grade of C or SED 457 Minimum Grade of C).

SED 465  Internship  3 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Prerequisite: Appropriate methods course.

SED 466  Stu Tchg Lang Arts in the HS  9 TO 12 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field.
Pre-requisites: Admission to candidacy, SED 340 and SED 341, appropriate methods course(s), completion of three-fourths of teaching field(s), and a PRAXIS II score of 151 or higher.
Pre-requisite: PRAXIS-Eng Lang, Lit and Comp 151 and SED 340 Minimum Grade of C and SED 341 Minimum Grade of C and SED 453 Minimum Grade of C and SED 457 Minimum Grade of C.

SED 467  Stu Tchg Soc Studies in the HS  9 TO 12 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field.
Pre-requisites: Admission to candidacy, SED 340 and SED 341, appropriate methods course(s), completion of three-fourths of teaching field(s), and a PRAXIS II score of 151 or higher.
Pre-requisite: PRAXIS-Soc St Cont Knowledge 153 and SED 340 Minimum Grade of C and SED 341 Minimum Grade of C and SED 457 Minimum Grade of C.
SED 468  Student Tchg Science in the HS  9 TO 12 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Prerequisites: Admission to candidacy, SED 340 and SED 341, appropriate methods course(s), completion of three-fourths of teaching field(s), and a PRAXIS II score of 146 or higher.
Pre-requisite: PRAXIS-Gen Sci Cont Knowledge 147 and SED 340 Minimum Grade of C and SED 341 Minimum Grade of C and SED 456 Minimum Grade of C.

SED 469  Student Tchg Math in the HS  9 TO 12 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Prerequisites: Admission to candidacy, SED 340 and SED 341, appropriate methods course(s), completion of three-fourths of teaching field(s), and a PRAXIS score of 118 or higher.
Pre-requisite: PRAXIS-Math Cont Knowledge 126 and SED 340 Minimum Grade of C and SED 341 Minimum Grade of C and SED 454 Minimum Grade of C.

SED 470  Stu Tchg N-12 Program  9 TO 12 cr
Observation and supervised teaching with opportunity for study and discussion of problems and issues encountered in the N-12 program. Students will be placed with a person holding a valid teaching certificate in the appropriate field. Pre-requisite: (Core Acad Skills Edu Reading 156 and Core Acad Skills Edu Writing 162 and Core Acad Skills Edu Math 150 ) or (AECTP Overall P and PRAXIS-Music Cont Knowledge 161 )

SED 490  Special Topics  3 cr
Current topics of special concern to secondary educators. Not more than 6 hours may be earned in Special Topics courses.

SED 494  Dir St -  1 TO 3 cr
Directed study. No more than 6 hours can be accepted for a Bachelor's Degree and Class B Certificate. Prerequisites: Permission of department chair.

SED 499  Senior Honors Project - H  3 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of secondary study, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to 6 credit hours. Prerequisite: Participant in honors program and junior level status.

SED 529  Grad Field Experience  0 TO 3 cr
Supervised practice in teaching curriculum areas in middle and high school classroom settings during the semester in which the corresponding methods course is taken. Co-requisite: ELT 530, SED 557, SED 565

SED 544  Guiding Lrng in the Sec School  3 cr
Study of methods and techniques of teaching in the secondary schools. Assists students in organizing materials, developing strategies for teaching their discipline area in secondary school. Includes field experience.

SED 547  Tchg Basic Writing Skills  3 cr
Background in theories of the writing process and techniques to help students develop writing skills. The main emphasis will be on teaching the process of writing: evaluation of writing and the issue of non-standard English will also be considered.

SED 551  The Secondary School Student  3 cr
Study of the physical, mental, and social development of students at secondary school age levels. The objectives and procedures of American secondary education are related to the development of adolescents in our culture. Included are the level of significance of specific individual differences among students in the various fields, the relationship of student self-concept to learning, students study through use of records, a variety of diagnostic materials, and group study projects.

SED 552  The High School Curriculum  3 cr
The study of the purpose of American secondary education and how these are reflected in the school curriculum. Curriculum organization, professional roles in curriculum development, and forces shaping the curriculum today are examined.

SED 553  Tchg Lang Subj in Sec School  3 cr
Assists students in organizing materials and developing methods of teaching language subjects in secondary schools. Includes field component. Pre-requisite: SED 555 Minimum Grade of B.

SED 554  Tchg Math in Sec Schools  3 cr
Assists students in organizing materials and developing methods of teaching mathematics in secondary schools. Includes field component. Pre-requisite: SED 555 Minimum Grade of B.

SED 555  Curriculum-Tchg in Sec School  3 cr
This course provides an introduction to effective instructional practices in the secondary classroom. The focus is on planning for and delivering the type of instruction which promotes successful classroom management. This course has a required field experience.

SED 556  Tchg Science in Sec Schools  3 cr
Assists students in organizing materials and developing methods of teaching science in secondary schools. Includes field component. Pre-requisite: SED 555 Minimum Grade of B.
SED 557  Tchg SS in Secondary Schools  3 cr
Assists students in organizing materials and developing
methods of teaching social studies in secondary schools.
Includes field component.
Pre-requisite: SED 555 Minimum Grade of B.

SED 558  The Middle School Curriculum  3 cr
A study of the Middle School program in light of the
characteristics and educational needs of youth in early
adolescence.

SED 559  Adv Teaching Techniques  3 cr
Study and practice of selected instructional strategies and
classroom management for middle level education and
secondary education.

SED 560  Graduate Research Seminar  3 cr
Research in problems confronting American secondary
education. Selected topics are explored by students which
provide the basis for seminar discussions. A seminar paper
is presented by each student. This course also includes
a field-based practicum. Prerequisite: Permission of the
department chair.
Pre-requisite: IDE 510 Minimum Grade of C.

SED 561  Trends-Prac Tchg Lang Sec  3 cr
Current trends and practices in curriculum, instruction,
selection of materials, and derivation of procedures for
guiding learning in reading, listening, writing, and speaking.

SED 562  Trends-Prac Tchg Soc St  3 cr
Current trends and practices in organizing and teaching
social studies in the secondary school. The selection and
use of content, materials, methods, and the development
and appraisal of typical units are emphasized.

SED 563  Trends-Prac Tchg Math Sec  3 cr
Current curriculum trends in teaching mathematics. Included
are the selection of materials and a study of methods
appropriate for teaching mathematics in the secondary
school.

SED 564  Trends-Prac Tchg Science  3 cr
Current curriculum trends in teaching science in the
secondary school. Included are the selection of materials
and an evaluation of those methods which are appropriate
for teaching the biological and physical sciences.

SED 565  Trends - Prac Tchg Foreign Lan  3 cr
Current trends and practices in curriculum, instruction,
selection of materials, and derivation of procedures for
guiding learning in reading, listening, writing, and speaking
in Foreign Languages.
Pre-requisite: SED 555 Minimum Grade of B.

SED 567  Multicultural Exper Sec School  3 cr
In an increasingly diverse society, teachers must be able
to work with students from a variety of backgrounds, some
quite different from teachers’ own cultural backgrounds. This
course responds to the growing need for better training for
teachers in how to work with a diverse population, increase
academic achievement, and prepare students for a global
workplace.

SED 590  Sp Top -  3 cr
Current topics of special concern to secondary educators. A
different topic will be used each time the course is offered.
No more than 6 hours may be applied toward a degree
program.

SED 593  Intern in Sec Educ Forgn Lang  3 TO 6 cr
The internship is a supervised learning experience in a work
setting similar to that in which an educator will eventually
be employed. The internship provides the student with an
opportunity to apply the theories and concepts learned
during the graduate secondary foreign language program.
Not more than six hours may be taken. Prerequisite: An
acceptable PRAXIS II test score.
Pre-requisite: EDU 453 Minimum Grade of C and SED
555 Minimum Grade of C and SED 559 Minimum Grade of
C and SED 565 Minimum Grade of B or PRAXIS-French
World Language 162 or PRAXIS-German World Language
163 or PRAXIS-Spanish World Language 168 .

SED 594  Dir St - Research  1 TO 3 cr
Students explore through directed study problems and
issues of special interest or significance in secondary
education. No more than 3 hours of any departmental 594
courses can be applied toward degree program. Requires
permission of department chair.

SED 595  Intern in Sec Edu Lang Arts  3 OR 6 cr
The internship is a supervised learning experience in a work
setting similar to that in which an educator will eventually
be employed. The internship provides the student with an
opportunity to apply the theories and concepts learned
during the graduate secondary language arts program. Not
more than 6 hours may be taken. Prerequisite: PRAXIS II
test score of 151 or higher.
Pre-requisite: (EDU 453 Minimum Grade of C or SED
553 Minimum Grade of B) and SED 555 Minimum Grade of
C and SED 559 Minimum Grade of C and PRAXIS-Eng Lang
Arts-Cont Know 167 .
SED 596  Intern in Sec Edu Soc Studies  3 OR 6 cr
The internship is a supervised learning experience in a work setting similar to that in which an educator will eventually be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate secondary social studies program. Not more than six hours may be taken. Prerequisite: PRAXIS II test score of 151 or higher.
Pre-requisite: (EDU 457 Minimum Grade of C or SED 557 Minimum Grade of B) and SED 555 Minimum Grade of C and SED 559 Minimum Grade of C and (PRAXIS-Soc St Cont Knowledge 155 or PRAXIS-Soc Stud Cont Knowledge 155 ).

SED 597  Intern in Sec Educ Science  3 TO 6 cr
The internship is a supervised learning experience in a work setting similar to that in which an educator will eventually be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate secondary science program. Not more than six hours may be taken. Prerequisite: PRAXIS II test score of 146 or higher.
Pre-requisite: (PRAXIS-Gen Sci Cont Knowledge 152 or PRAXIS-Gen Science Cont Knowl 152 ) and (EDU 456 Minimum Grade of C or SED 556 Minimum Grade of B) and SED 555 Minimum Grade of C and SED 559 Minimum Grade of C.

SED 598  Intern in Sec Educ Math  3 TO 6 cr
The internship is a supervised learning experience in a work setting similar to that in which an educator will eventually be employed. The internship provides the student with an opportunity to apply the theories and concepts learned during the graduate secondary math program. Not more than six hours may be taken. Prerequisite: PRAXIS II test score of 118 or higher.
Pre-requisite: (PRAXIS-Math Cont Knowledge 155 ).

SED 599  Thesis  1 TO 9 cr
A student selects a project, study, or investigation in secondary education related to his area of specialization. The project forms a basis for the thesis. The thesis committee will give guidance during the investigation and during the writing of the thesis.

SED 699  Research Project  1 TO 3 cr
The culminating experience which the candidate must synthesize and apply the various program components in a selected instructional setting. The student completes a research project in a public school setting under the guidance of a department faculty committee. May be taken more than one semester. Prerequisite: Permission of the department chair.
Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

Social Work (SW)

SW 200  Intro to SocWork-SocWelfare  3 cr
Introduction to the profession of social work. Topics include historical development, nature of profession, professional associations, practice theory, values and ethics.

SW 201  Human Behav/Social Environ I  3 cr
The Person-In-Environment model of human behavior. Course examines individual, family and group behavior in the social context.
Pre-requisite: (BLY 101 Minimum Grade of C and BLY 101L Minimum Grade of C) or (BLY 121 Minimum Grade of C and BLY 121L Minimum Grade of C).

SW 214  SW Skills and Field Experience  3 cr
Service learning experience in social work. Forty hours of agency-based experience is required. Students must attend two hour weekly skills development lecture.
Pre-requisite: SY 109 Minimum Grade of C or SY 112 Minimum Grade of C.

SW 220  Power, Privilege & Oppression  3 cr
This course is designed as an introduction to the field of social work with diverse populations. The purpose is to prepare students to work with diverse groups of people locally and globally. This course examines issues related to the creation of race in America, the oppression of people on the basis of their gender, ethnicity, race, culture, sexual orientation, physical or mental ability, age, religion and national origin.

SW 300  Ethical Decision-Making-W  3 cr
This course provides a more in-depth analysis of the Social Work Code of Ethics and overviews frameworks for ethical decision-making. The emphasis is on improving students’ ability to more readily identify ethical problems and thoughtfully work through these issues through the use of case studies.
Pre-requisite: EH 101 Minimum Grade of C or EH 101L Minimum Grade of C.

SW 301  Social Welfare Policy  3 cr
Social Policy in relation to Social Work Practice. Course addresses social policy analysis, social advocacy, diversity and social and economic justice.

SW 302  Human Behav/Social Environ II  3 cr
The Person-In-Environment Model of human behavior. Course examines task groups, organizations, and community systems in the social context.
Pre-requisite: SY 109 Minimum Grade of C.

SW 310  Community Context  3 cr
The rural and urban contexts of social work practice. Emphasis of the course is placed on how these contexts affect human behavior and the practice of social work.
<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Description</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW 340</td>
<td>Family Violence</td>
<td>3 cr</td>
<td>Study of the social problems of family violence including domestic violence, intimate partner violence, child abuse, and elder abuse. The role of the social worker, social services, and social policy will be examined.</td>
<td>SY 109 Minimum Grade of C.</td>
</tr>
<tr>
<td>SW 350</td>
<td>Child Welfare Services</td>
<td>3 cr</td>
<td>General survey of the Social Work field of child welfare services with a focus on child protective services.</td>
<td></td>
</tr>
<tr>
<td>SW 360</td>
<td>SW Practice in Mental Health</td>
<td>3 cr</td>
<td>This course is designed to provide the student with an overview of the mental health system and focuses specifically on issues related to the role of a social worker in a mental health setting.</td>
<td>SW 200 Minimum Grade of C.</td>
</tr>
<tr>
<td>SW 401</td>
<td>Generalist Practice I</td>
<td>3 cr</td>
<td>The Generalist Model of social work applied to individuals, families, and groups. Emphasis is placed on diversity, social work values and ethics, and evidence based practice.</td>
<td>(SW 302 Minimum Grade of C or SW 202 Minimum Grade of C). SW 302 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SW 402</td>
<td>Generalist Practice II</td>
<td>3 cr</td>
<td>The Generalist Model of social work applied to organizations, communities and task groups. Emphasis is placed on diversity, social work values and ethics and social justice.</td>
<td></td>
</tr>
<tr>
<td>SW 412</td>
<td>Field Instruction</td>
<td>3 TO 12</td>
<td>Field Instruction in social work. Four hundred thirty-six hours of supervised experience in social work setting. SW 412 can be taken during a single semester or over multiple semesters.</td>
<td>SW 414 Pre-requisite: SW 401 Minimum Grade of C and SW 402 Minimum Grade of C and SY 382 Minimum Grade of C.</td>
</tr>
<tr>
<td>SW 414</td>
<td>Senior Seminar - W</td>
<td>3 cr</td>
<td>This is the capstone senior level course in social work. Class discussion and assignments are designed to facilitate integration between field instruction experience and curriculum content. SW 412 must be taken concurrently.</td>
<td>Fee. Pre-requisite: SW 412 Pre-requisite: SW 401 Minimum Grade of C and SW 402 Minimum Grade of C and SY 382 Minimum Grade of C.</td>
</tr>
<tr>
<td>SW 420</td>
<td>Social Work in Health Care</td>
<td>3 cr</td>
<td>Study of the practice of social work in the health care field. Major social policy issues, service delivery systems, relationships with other health care professionals, and practice issues related to social work will be covered.</td>
<td></td>
</tr>
<tr>
<td>SW 460</td>
<td>Rural Social Services</td>
<td>3 cr</td>
<td>This elective course in rural social services provides a survey of professional services with rural and small communities. It is open to all majors. Included are topics related to services, social policy, rural culture and behavior, professional values and ethics, diversity, and services.</td>
<td>EH 102 Minimum Grade of C.</td>
</tr>
<tr>
<td>SW 490</td>
<td>Special Topics</td>
<td>3 cr</td>
<td>Advanced topics in Social Work. May be repeated twice for elective content when topic varies.</td>
<td></td>
</tr>
<tr>
<td>SY 109</td>
<td>Introductory Sociology</td>
<td>3 cr</td>
<td>Sociology is the scientific study of social behavior and social phenomena. This course is a survey intended to introduce students to the major concepts, issues, theory, methods and substantive findings of the discipline. Topics may include the impact of social structures on behavior and opportunity, inequalities, socialization, culture, religion, crime and deviance, the family, modernity, and globalization.</td>
<td>Core Course.</td>
</tr>
<tr>
<td>SY 112</td>
<td>Social Problems</td>
<td>3 cr</td>
<td>A study of persistent and recurring social conditions and individual and group behaviors that are contrary to the expressed norms of community members and that community members strive to control through collective action.</td>
<td>Core Course.</td>
</tr>
<tr>
<td>SY 200</td>
<td>Sex, Power, &amp; Politics</td>
<td>3 cr</td>
<td>An analysis of social patterns in sexual identifies, behaviors, and desires, including an introduction to history of sexuality, contemporary theories of sexuality, and the politics of sexuality today.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 220</td>
<td>Marriage and the Family</td>
<td>3 cr</td>
<td>The organization, function, and present status of the family, primarily in the United States. Problems of mate selection, marital adjustment, and parent-child relations treated on the basis of recent and current social change.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 241</td>
<td>Criminology</td>
<td>3 cr</td>
<td>The nature and causation of criminal behavior. Evaluation of theories and research.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 242</td>
<td>Corrections</td>
<td>3 cr</td>
<td>Administration of criminal justice in American society. Federal state and local prison systems; management and treatment of criminals; history of punishment; jail detention, probation and parole; prison activities; rehabilitation.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
</tbody>
</table>
SY 290  Special Topics -  3 cr
Selected topics in sociology. May be taken for a maximum of nine hours credit when the subject matter varies.
Pre-requisite: SY 109 Minimum Grade of D.

SY 315  African American Families  3 cr
The study of family structure, male selection, marital and other romantic interaction, parenting and kinship among African Americans.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 319  Sociology of Drugs  3 cr
This course examines social, historical, cultural, and political factors that shape ideas about drugs and views on drug use, drug treatment, and drug policy.
Pre-requisite: SY 109 Minimum Grade of D.

SY 340  Juvenile Delinquency  3 cr
A study of the nature, extent, treatment, and prevention of delinquent behavior among youth in the United States and other urban industrial societies.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 350  Evolutionary Sociology  3 cr
This course considers social behavior and social phenomena as manifestations of the observable properties of the organisms that make up societies (i.e. ‘human nature’). The core of the course will involve constructing a brief but sound model of human behavior and then seeing how well that model can help explain a spectrum of behavior and phenomena. In addition, we will consider different religious, cultural, and scientific views on human nature, as well as some of the classic philosophical debates (e.g. nature/nurture) that revolve around questions of human nature.

SY 352  World Religions  3 cr
This course is an introduction to the religions of the world. It is divided into three basic units: Indigenous Religions (of Africa, North America, and Oceania); Eastern Religions (Hinduism, Buddhism, Daoism, Confucianism, Jainism) and Western Religions (Judaism, Christianity, Islam). The emphasis is on grasping the core principles of each tradition, seeing the ways in which religion meets basic human needs, and religion as a cultural artifact that borrows, adapts, and changes over time. Course is identical with PHL 352 and REL 352. Credit cannot be received for both SY 352 and PHL 352 or REL 352.

SY 360  Soc of Work and Occupations  3 cr
Examines work, occupations and careers in modern societies. Course topics include: the evolution of work, the meaning of work, the demography of work, unions, jobs, occupations, professions, industries, classes, unions, technology and alienation, labor market segmentation, nonstandard and contingent work, and the family, work and economic inequality, job satisfaction and organizational commitment.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 372  Social Gerontology - W  3 cr
Sociological aspects of aging in contemporary American society. Within its parameters are related problems of economics, health, and social contacts.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 376  Modern Sociological Theory  3 cr
The major schools of sociological theory after 1920’s as well as recent challenges to these schools.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 381  Social Research Design (C)  3 cr
The goal of this course is to provide you with a foundation in social science research methods. The course will cover basic concepts used in social science research, sampling, survey instrument construction, observational and experimental research designs, and qualitative research. In addition to providing you with a foundation in research methods, SY 381 and SY 382 will give you the computing skills needed to create and analyze quantitative data using SPSS and EXCEL.
Pre-requisite: SY 109 Minimum Grade of D.

SY 382  Social Research Analysis (C)  3 cr
This course, along with SY 381, provides a foundation in social research methods and statistics. In this course you will develop a mastery of descriptive and inferential statistics, basic probability theory, and significance testing. The computer lab portion of this course will continue to build upon the research and skills you acquired in SY 381.
Pre-requisite: SY 109 Minimum Grade of D.

SY 394  Directed Studies  1 TO 3 cr
Field or library pursuits through which special interests or needs of the student may be pursued on an individual, supervised, or tutorial basis. No more than six hours may be used in the degree. Arrangements must be made with the instructor prior to registration. Requires permission of Department Chair.

SY 401  Disasters and Society  3 cr
The Sociological examination of natural, technological, and human-initiated disasters. The social impacts of disasters will be reviewed through case-studies of major twenty-first century catastrophes and issues of community vulnerability, resiliency and recovery will be addressed.
Pre-requisite: SY 109 Minimum Grade of C.
<table>
<thead>
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</thead>
<tbody>
<tr>
<td>SY 411</td>
<td>Population - W</td>
<td>3 cr</td>
<td>An introduction to the study of human populations: population growth and decline; fertility, mortality, and migration; characteristics of populations; population, food and economic development; demographic analysis; population policies.</td>
<td>SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SY 412</td>
<td>Applied Sociology - W</td>
<td>3 cr</td>
<td>A survey of the specialties and techniques of professional sociologists, including the kinds of social problems and how these problems are addressed.</td>
<td>SY 109 Minimum Grade of C and SY 381 Minimum Grade of D and SY 382 Minimum Grade of D and SY 376 Minimum Grade of D. SY 382 and SY 376 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SY 415</td>
<td>Soc of Mental Health-Illness</td>
<td>3 cr</td>
<td>A sociological analysis of mental health and illness including social epidemiology, effects of social integration and support, labeling mechanisms, social evolution of treatment systems, and cultural factors in the recognition and diagnosis of disorders.</td>
<td>SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SY 418</td>
<td>Adv Family Studies</td>
<td>3 cr</td>
<td>This course examines interaction patterns in different types of family structure, with emphasis on marital adjustment, parent-child interaction, and sibling interactions.</td>
<td>SY 109 Minimum Grade of D and SY 220 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 420</td>
<td>Sociology of Religion</td>
<td>3 cr</td>
<td>The study of religion is at or near the core of sociology. This course is an exploration of the sociological dimensions of religion within the classical theoretical traditions of Durkheim, Weber and Marx, augmented with more recent theory and research. We consider the definition, functions and origins of religion, the role of beliefs and rituals in it, the interaction of religion with other aspects of society, and secularization of the future of religion, among other topics.</td>
<td>SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SY 421</td>
<td>Social Stratification - W</td>
<td>3 cr</td>
<td>This course introduces students to the patterns and processes of inequality in its major forms. It includes discussions of social class, sex, race, ethnicity, and policy. Additionally, this course satisfies the University's writing requirement. As such, students will acquire knowledge through writing assignments and will demonstrate mastery of new information in written form.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 426</td>
<td>Social and Cultural Change</td>
<td>3 cr</td>
<td>This course is designed to familiarize students with major theories and processes of social and cultural change, the factors influencing social and cultural change, diffusion of innovations, and adoption of new ideas and practices.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 428</td>
<td>Gender and Society</td>
<td>3 cr</td>
<td>Description and analysis of gender roles and inequality in contemporary Western societies in cross-cultural and historical context.</td>
<td>SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SY 430</td>
<td>Sociology of Culture</td>
<td>3 cr</td>
<td>Examines the major perspectives in the sociology of culture, with emphasis on the problems of culture in modern and post-modern societies.</td>
<td>SY 109 Minimum Grade of B.</td>
</tr>
<tr>
<td>SY 435</td>
<td>Health Disparities Life Span</td>
<td>3 cr</td>
<td>This course examines differences in health status across the life span. The course will focus heavily on racial/ethnic and socioeconomic disparities in health applying a social determinants' of health framework. Issues that will be considered include how income, education, neighborhood conditions, access to health care, and other community factors shape opportunities to be healthy. The course is cross-listed as SY 435 and GRN 435 and has been approved as an elective for the Undergraduate Certificate in Gerontology and the interdisciplinary minor in Gerontology.</td>
<td>SY 109 Minimum Grade of D.</td>
</tr>
<tr>
<td>SY 440</td>
<td>Deviance and Social Control</td>
<td>3 cr</td>
<td>The study of societal norms and their violation. Focus on social construction, control, condemnation and accommodation of deviant behavior.</td>
<td>SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.</td>
</tr>
<tr>
<td>SY 445</td>
<td>Majority-Minority Relations-W</td>
<td>3 cr</td>
<td>The study of relationships between 'majorities' and 'minorities' in society. This course will explore the macrosocial forces that bring these relationships about and the institutional setting where different group members come into contact with each other. A variety of key concepts and theories surrounding majority and minority relations will be defined and analyzed. Historical and current case studies will be examined to illustrate the development of these relations.</td>
<td>SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.</td>
</tr>
</tbody>
</table>
SY 455 Self and Certainty 3 cr
This course explores the complex relationship between the individual and the groups they are a part of, with a special emphasis on the challenges of identity and knowledge in modern society. Draws primarily upon the work of classical social psychologists like Mead, Berger & Luckman, Foggman and Simmel, as well as modern extensions of their work.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 458 Crowds Riots Soc Movements - W 3 cr
A survey of the theoretical and historical foundations of collective behavior, riots, and social movements. A variety of situations and behaviors will be analyzed including social movement participation; growth and organization; strategies, tactics, and consequences for participants and society.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 459 Medicine and Society 3 cr
The sociological study of medical care, with topics ranging from the micropolitics of doctor-patient communication through macro-level investigation of comparative health care systems.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 460 Social Organization - W 3 cr
This course provides the student with a comprehensive behavioral science approach to understanding modern social organizational trends.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 467 Environmental Sociology 3 cr
This course will cover topics such as public awareness and the social construction of environmental issues, especially acid rain, biodiversity, biotechnology and technological disasters.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 472 Sociology of Aging and Family 3 cr
The class focuses on sociological theories of family and aging and the linkages of families and their aging members with organizations that deliver services, including: government agencies, healthcare organizations, legal services, corporations/businesses, and religious organizations.
Pre-requisite: SY 109 Minimum Grade of D. SY 109 can be taken concurrently with this course.

SY 475 Dev of Sociological Theory 3 cr
The development of theories in sociology, as related to social thought, institutions, and theories of social progress.
Pre-requisite: SY 109 Minimum Grade of D.

SY 490 Special Topics 1 TO 3 cr
A sociological examination of advanced topics. This course may be taken for a maximum of 9 hours credit when the subject matter varies. Prerequisite: Upper division status. Pre-requisite: SY 109 Minimum Grade of D.

SY 492 Seminar - W - 3 cr
Selected topics in sociology for students with junior or senior standing. Note: SY 492 is not intended for graduate students.

SY 494 Directed Studies 1 TO 3 cr
Designing a study, carrying out the research, and writing the result of a thesis. No more than six hours credit may be applied to major. Prerequisites: Requires upper division status and permission of department chair.

SY 496 Sociology Internship 3 TO 6 cr
Provides an opportunity to combine academic principles with practical experience in an agency dealing with human relationships. Specifics of the assignment result from a mutual agreement among student, faculty supervisor and agency. Course may be repeated for a maximum of six hours of credit. The 3-hour internship requires 100 contact hours; the 6-hour internship requires 200 contact hours. Requires permission of Faculty Supervisor and Department Chair. Fee.

SY 500 Orientation 1 TO 3 cr
Introduces students to graduate study in sociology by providing information about applicable academic degrees, career opportunities, and professional activities in the discipline.

SY 501 Disasters and Society 3 cr
The sociological examination of natural, technological, and human-initiated disasters. The social impacts of disasters will be reviewed through the case-studies of major twenty-first century catastrophes and issues of community vulnerability, resiliency, and recovery will be addressed.

SY 505 Adv Principles of Sociology 3 cr
Systematic review and integration of major propositions, concepts, and research data from various fields of sociology. Development of a comprehensive orientation for the description and explanation of social phenomena.

SY 506 Contemp Sociological Theory 3 cr
Critical examination of major theoretical schools after 1920 and their classical predecessors; also examination of recent challenges to and syntheses of these schools.

SY 508 Research Design 3 cr
Advanced treatment of topics in sociological methodology, including: logic of scientific explanation; experimental, quasi-experimental, survey and qualitative research designs; and research ethics.
SY 509 Research Analysis 4 cr
This is an applied course in the application of data analysis and statistical methods in social research. The course covers basic regression models with limited and categorical independent variables. It assumes knowledge of basic and inferential statistics. The course includes weekly instruction in data analysis and statistical computer use. This course is usually taught in the Spring semester.

SY 510 Qualitative Inquiry 3 cr
This course introduces students to methods of qualitative inquiry in sociology, focusing on ethnography and participant observation.

SY 511 Introduction to Population 3 cr
An introduction to the study of human populations: population growth and decline, fertility, mortality and migration; characteristics of populations: population, food and economic development: demographic analysis: population policies. Students will be able to substantively analyze in any discussion of past and future population problems and its related factors that affect different societies.

SY 512 Applied Sociology 3 cr
A survey of the specialties and techniques of professional sociologists and the conditions under which sociological knowledge is applied to social problems, the kinds of problems addressed, and the degree of effectiveness of applications. A variety of methods will be discussed including social impact analysis, program evaluation, needs assessment, and social indicators. Requires SY 508 and SY 509 or instructor's permission.
Pre-requisite: SY 508 Minimum Grade of B and SY 509 Minimum Grade of B.

SY 515 Soc of Ment Health and Illness 3 cr
A sociological analysis of mental health and illness including social epidemiology, effects of social integration and support, labeling mechanisms, social evolution of treatment systems, and cultural factors in the recognition and diagnosis of disorders.

SY 518 Advanced Family Studies 3 cr
This course examines interaction patterns in different types of family structure, with emphasis on marital adjustment, parent-child interaction, and sibling interactions.

SY 520 Sociology of Religion 3 cr
An analysis of religion as a social institution with emphasis on modern western societies. Topics include the function of religion for societies and individuals, changing patterns of religious belief and practice, and the relationship between religion and other social institutions.

SY 521 Poverty, Inequal/Social Stat 3 cr
A sociological approach to the study of class, status, power and poverty with a particular emphasis on American society. Students will present material in the classroom and conduct an advanced research project in the area of social inequality.

SY 523 Aging in American Society 3 cr
The role of the elderly in today's society, problems, adaptability, crises, functions. Comparisons with youth and working adults. Survey of social programs and resources in formal and informal support networks.

SY 528 Gender and Society 3 cr
Description and analysis of gender roles and inequality in contemporary Western societies in cross-cultural and historical context.

SY 530 Sociology of Culture 3 cr
This course will introduce students to the major perspectives in the field of the sociology of culture. Particular attention will be given to each perspective's diagnosis of the problems of culture in modern and postmodern capitalist societies.

SY 535 Health Disparities Life Span 3 cr
The main purpose of this seminar is to provide students with an understanding of how social factors contribute to racial/ethnic, socioeconomic and gender disparities in health and health care. We will examine how dyadic relationships such as interpersonal forms of discrimination, marriage, and social ties may contribute to health disparities. We will also examine the ways in which neighborhood and community context, as well as inequalities in socioeconomic status materially shape health and access to health care services. The course is cross-listed as SY 535 and GRN 435/535 and has been approved as an elective for the Undergraduate/Graduate Certificate in Gerontology and the interdisciplinary minor in Gerontology.

SY 540 Deviance and Social Control- 3 cr
Deviance includes acts that violate norms. Social control is the groups' efforts to induce people to conform to these norms. This course includes discussions of what actually is deviance, how things become deviant, and how sociologists explain deviance. Several weeks are devoted to talking about specific forms of deviance, ranging from alcohol and drugs to mental illness. The last part of the course is spent discussing elite deviance.

SY 547 Sociology of Law 3 cr
Overview of predominant theoretical approaches, classical and contemporary in legal sociology, and their application in empirical studies engaging legal phenomena.

SY 550 The Community 3 cr
An advanced consideration of the concept of community.

SY 555 Self and Certainty 3 cr
This course explores the complicated relationship between individuals and the groups they are part of, with a special emphasis on the challenges of identity and knowledge in modern society. Draws primarily upon the work of classical social psychologists like Mead, Berger, Luckmann, Foggman and Simmel as well as modern extensions of their work.
SY 559  Medicine and Society  3 cr
The sociological study of medical care, with topics ranging
from the micropolitics of doctor-patient communication
through macro-level investigation of comparative health care
systems. Explores extant research methods and theories
of medical sociology to prepare graduate students to do
sociological research in health care settings.

SY 567  Environmental Sociology  3 cr
This course will cover topics such as public awareness and
the social construction of environmental issues, especially
acid rain, biodiversity, biotechnology, and technological
disasters.

SY 572  Sociology of Aging-Family  3 cr
The class focuses on sociological theories of family
and aging, and the linkages of families and their aging
members with organizations that deliver medical and social
services, with government bureaucracies, the legal system,
corporations and businesses, and religious organizations.

SY 590  Sp Top -  3 cr
Selected topics in graduate sociology. Course may be
repeated for different topics.

SY 591  Papers & Presentations Seminar  1 TO 2 cr
A self-directed studies course, guided by graduate faculty
mentors, to develop and enhance the career and scholarly
interests, and professional socialization, of advanced
master's students through written work and presentation
opportunities.
Pre-requisite: MASY Comprehensive Exam Score P

SY 592  MA Practicum Report Proposal  3 cr
Based on student work in a local agency (in conjunction
with course co-requisite SY 596, Sociology Internship) to
generate a practicum report proposal (directed by a member
of the sociology graduate faculty) that the student must
formally defend.
Pre-requisite: SY 596 . SY 596 can be taken concurrently
with this course.

SY 593  Master’s Practicum Report  3 cr
Course in which students prepare and defend a formal
report based on work in course pre-requisite SY 596 and SY
592.
Pre-requisite: SY 596 Minimum Grade of B and SY 592
Minimum Grade of B. SY 596 can be taken concurrently
with this course.

SY 594  Directed Studies -  1 TO 3 cr
Field or library projects through which special interests
of the student may be pursued on a tutorial basis with a
graduate faculty member. Arrangements must be made
with the professor prior to registration. Permission of the
Department Chair is required.

SY 595  SY Research Apprenticeship  1 TO 3 cr
Students pursue research-related interests as directed by,
and with prior approval from, a member of the graduate
faculty.

SY 596  Sociology Internship  3 TO 6 cr
Relates the student's classroom studies to occupational and
professional experiences in an approved community agency
that culminates with a written report. Requires permission
of the Graduate Coordinator and Department Chair as well
as proof of insurance. The 3 hour internship requires 100
contact hours; the 6 hour internship requires 200 contact
hours.

SY 597  Sociology Teaching Apprentice  1 TO 3 cr
The student will work directly with a member of the
Sociology faculty to learn pedagogy, innovation in teaching,
and course content that will equip the student for future
teaching assignments.

SY 598  Master’s Thesis Proposal  3 cr
Focused on a specialized subject area of research interest
in sociology (directed by a member of the sociology
graduate faculty) to generate a thesis proposal that the
student must formally defend.

SY 599  Master’s Thesis  1 TO 6 cr
Focused on a specialized subject area of research interest
in sociology to generate a master's-level thesis that the
student must formally defend. (Pre-requisite: SY 598,
Master's Thesis Proposal).
Pre-requisite: SY 598 Minimum Grade of B.

Special Education (SPE)

SPE 200  Field Exp in SPE Settings  1 cr
A series of in-field opportunities for students in Special
Education. A variety of appropriate placements will be
employed depending on each student's interest and needs.
May be repeated for credit.

SPE 201  Field Exp in Sp Ed Setting  1 cr
A series of in-field opportunities in special education.
A variety of appropriate placements will be employed
depending on each student's interests and needs. To be
taken with SPE 312.

SPE 202  Field Exp in Sp Ed Setting  1 cr
A series of in-field opportunities in special education.
A variety of appropriate placements will be employed
depending on each student's interests and needs. To be
taken with SPE 410.
Co-requisite: SPE 410

SPE 203  Field Exp in Sp Ed Setting  1 cr
A series of in-field opportunities in special education.
A variety of appropriate placements will be employed
depending on each student's interests and needs. To be
taken with SPE 410.
Co-requisite: SPE 410
SPE 205 Init Field Exp in SPE Setting  1 cr
An in-field opportunity for early field-based practicum in a variety of placements. To be taken with SPE 400 by Special Education majors.

SPE 311 Intro to Partnerships in SPE  3 cr
Emphasis is on the special problems found in the home, community, and school of the exceptional child, the teacher, the family, and community resource agencies. Ways for the teacher to form teams for work collaboratively with all human resources involved in the child's life are explored and ethical and moral standards examined.

SPE 312 Intellect and Phys Disabs  3 cr
A study of the intellectual and physical disability which usually require substantial curriculum adaptations or ecological accommodation. Historical perspectives, etiology, definitions, classification, treatment, social aspects and interdisciplinary team work will be explored. Co-requisite: SPE 201

SPE 313 Lrng and Behavrl Disorders  3 cr
An examination of the definitions, characteristics, and prevalence of children with learning and/or behavioral disabilities. Emphasis is placed on the causes of problems in motor, perceptual, social, academic, affective, and behavioral development. Students will be introduced to current service delivery models and the programming options for individuals with learning and behavioral disabilities.

SPE 342 Dev-Tchg Ecological Curriculum  3 cr
An ecological systems view which emphasizes curricular design as a multisystem interaction involving the individual, family, school, occupational setting, and society.

SPE 362 Behav Mgt of Except Child - W  3 cr
Presentation of the principles and applications of behavioral modification, data collection procedures, and single-subject research designs as related to exceptional children and youth in special education environments. Pre-requisite: SPE 313 Minimum Grade of C and SPE 342 Minimum Grade of C and SPE 454 Minimum Grade of C.

SPE 363 Tch Adpt Curr Spec Nds Lrnrm  3 cr
An examination of regular and special education K-12 curricula, materials, and procedures. Specific emphasis will be placed on the selection modification, and adaptation of curriculum, materials, and procedures to meet the needs of individuals with learning and behavioral disabilities. Pre-requisite: SPE 313 Minimum Grade of C and SPE 342 Minimum Grade of C and SPE 454 Minimum Grade of C.

SPE 373 Teaching Reading to Stu Dis  3 cr
Introduces the student to the curriculum, teaching the methodologies and instructional activities and materials associated with effective and appropriate developmental and functional reading instruction for students with disabilities. Pre-requisite: SPE 313 Minimum Grade of C and SPE 342 Minimum Grade of C and SPE 454 Minimum Grade of C.

SPE 400 Edu for Except Child and Youth  3 cr
Introduction to the field of exceptional children and youth, involving the study of various areas of exceptionality.

SPE 410 Formal-Informal Assessment  3 cr
Assesses developmental levels, academic, and non-academic performance of exceptional individuals through the administration and interpretation of criterion-referenced, formal and informal measures. Evaluation of classroom teaching and special education programs is also emphasized. Co-requisite: SPE 202, SPE 203 Pre-requisite: SPE 313 Minimum Grade of C and SPE 342 Minimum Grade of C and SPE 454 Minimum Grade of C.

SPE 432 Impact Typ and Atyp Dev on Edu  3 cr
An examination of typical child development and developmental characteristics of infants, toddlers, and young children with disabilities from the prenatal period through age 8. Characteristics of disabling conditions and their impact upon development are also discussed.

SPE 433 Iss in Edu Young Child W-Dis  3 cr
This course prepares students to work with infants, toddlers, and young children with disabilities and their families. Topics covered include specific teaching and intervention techniques, special education laws and regulations, and service delivery models.

SPE 443 Voc Ed-Career Dev Dis Indiv  3 cr
Issues and practices involved in the vocational preparation and training of students with disabilities, including career awareness, exploration, preparation, and use of vocational resources. Vocationally related programs and services, both within and outside the special education environment are included. Pre-requisite: SPE 313 Minimum Grade of C and SPE 342 Minimum Grade of C and SPE 454 Minimum Grade of C.

SPE 444 Senior Seminar - W  3 cr
Topics based upon students’ experiences in internship. Students develop personal growth plans to enhance professional functioning.

SPE 454 Curric Meth Develop Young  3 cr
Curriculum and methods of instruction for individuals who function in the lower levels of cognitive, motor, self care, communicative, and/or social behaviors. Emphasis is on physical management, class/individual scheduling, adapted aids and equipment, task analysis, and functional life skills.

SPE 484 General Education Curriculum  3 cr
A Curriculum course designed to emphasize general education and special education K-12 curriculum. Students learn content of general education curricula through study of scope and sequence charts and strategies for adapting the curricula for students with exceptionalities, especially in inclusionary settings. Pre-requisite: SPE 313 Minimum Grade of C and SPE 342 Minimum Grade of C and SPE 454 Minimum Grade of C.
SPE 489 Pre-Practicum 3 cr  
Supervised experience in the teaching field which allows the teacher's performance to be evaluated qualitatively.

SPE 490 Sp Top - 3 cr  
Varies in content and deals with issues, trends, and topics of current interest in the field of educating exceptional individuals. May be repeated for credit when course content varies.

SPE 494 Dir St - 3 cr  
Directed Study. No more than two directed studies may be applied to programs at the undergraduate level or for certification.

SPE 495 Internship K-6 9 cr  
Observation and supervised K-6 classroom teaching experience providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.  
Pre-requisite: PRAXIS-Elem Ed Cont Knowledge 137 and SPE 363 Minimum Grade of C and SPE 410 Minimum Grade of C.

SPE 496 Internship 6-12 9 cr  
Observation and supervised 6-12 classroom teaching experiences providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.  
Pre-requisite: SPE 363 Minimum Grade of C and SPE 410 Minimum Grade of C.

SPE 497 Internship ECSE 9 cr  
Observation and supervised ECSE classroom teaching experiences providing the opportunity to synthesize all previous instruction. This culminating activity provides opportunity for study and discussion of problems and issues encountered in the practicum situation.  
Pre-requisite: PRAXIS-Elem Ed Cont Knowledge 137 and SPE 363 Minimum Grade of C and SPE 433 Minimum Grade of C.

SPE 499 Senior Honors Project-H 3 TO 6 cr  
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project, relevant to the field of study in Special Education, that will lead to a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three faculty chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to 6 credit hours. Prerequisite: Participate in honors program and junior level status.

SPE 500 Nat-Needs of Exc Chld and Yth 3 cr  
Introduction to the field of special education involving the study of all exceptionality areas. Developmental and maturational sequences of exceptional children/youth are included.

SPE 504 Seminar in Spec Educ 3 cr  
Designed to allow students an in-depth exploration of topics of special concern to them related to children with disabilities or high potential.

SPE 505 Admn and Supv of SPE 3 cr  
Establishing, maintaining, supervising, and evaluating special education programs in school districts and systems. Legislation and litigation, budgeting and finance, trends and issues in special education are included.

SPE 510 Intro to Lrng Char Tchg in SPE 3 cr  
An examination of the definitions, characteristics, and prevalence of children with learning disabilities, emotional and/or behavioral disabilities, mental retardation and multiple disabilities. Emphasis is placed on the environmental and biological causes of problems in motor, perceptual, social academic, affective, and behavioral development. Students will be introduced to current service delivery models and the programming for individuals with disabilities.

SPE 511 Curr - Reg Class and Adapt 3 cr  
Examination of all curricula as represented by various state course of study documents. Students will study and develop relevant adaptations of curricula to meet needs of various exceptional children.

SPE 512 Ecological Curr and Method 3 cr  
From an ecological systems view, methods of individually deriving a functional, life-centered curriculum for students with mild to severe disabilities as well as educational strategies for teaching and training within such a framework.

SPE 514 Teaming and Collaboration 3 cr  
An intensive study of the nature of teaming and collaborative practices with an emphasis on developing skills to organize and participate in a variety of such situations.  
Pre-requisite: SPE 512 Minimum Grade of B and SPE 516 Minimum Grade of B and SPE 589 Minimum Grade of B.

SPE 515 Data and Behav Mgmt 3 cr  
Behavioral assessment techniques and experimental designs for the evaluation of behavior change programs. Operant and respondent methods for deceleration of inappropriate behavior. Operant methods for accelerating appropriate behaviors, teaching new behaviors and maintaining behaviors. Data-Based decision making strategies for formative program evaluation and modifications.

SPE 516 Methods Spec Needs Learners 3 cr  
An examination of the methodologies employed in teaching special needs learners. The course covers the theoretical underpinnings and practical application of techniques with media, and materials.
SPE 517  Communication - Lang and Read  3 cr
Major topics include the nature of language, language development and language problems in exceptional students; and remedial procedures. Informal and formal language and reading assessment. Relationship of reading to writing, phonetic, sight and combination means of reading instruction.

SPE 518  Assessment  3 cr
Advanced assessment of developmental levels, academic and non-academic performance of exceptional individuals through the administration and interpretation of standardized tests, criterion-referenced instruments, and informal measures.

SPE 521  Children W-High Potential  3 cr
Study of the intellectual, creative, emotional, and other psychological facets of gifted and talented children. Attention will be paid both to those individuals whose potential is realized and those who are considered underachievers.

SPE 522  Creative and Prod Thinking  3 cr
Geared to understanding the creative process, personality, and product of gifted and talented children as well as how to foster creativity and productive thought in the classroom.

SPE 523  Tchg Children W-High Potential  3 cr
Various curricular emphases and program approaches employed for gifted, creative, and talented children are studied. Insights are offered into articulating educational efforts.

SPE 524  Atyp Children W-High Potential  3 cr
This course is an in-depth study of the unique needs of atypical populations of gifted students. Attention will be directed to the culturally diverse gifted, economically disadvantaged gifted, underachieving gifted, gifted in rural areas, gifted females, highly/profound gifted, gifted handicapped, gifted with ADD/ADHD/SLD, and gifted preschoolers.

SPE 525  Impact of Typical Atypical Dev  3 cr
An examination of typical child development and developmental characteristics of infants, toddlers, and young children with disabilities from the prenatal period through age eight. Characteristics of disabling conditions and their impact upon development are also discussed.

SPE 526  Issue Edu Young Child Disabil  3 cr
This course prepares students to work with infants, toddlers, and young children with disabilities and their families. Topics covered include specific teaching and intervention techniques, special education laws and regulations, and service delivery models.

SPE 534  Assessment Devel Young  3 cr
This course contains information on basic psychometric qualities of screening, evaluations, and assessments, tools for use with infants, toddlers, and young children with disabilities, conducting family assessments, adapting measures for children with disabilities and using screening assessment, and evaluation in individualized programming.

SPE 535  Collaborating with Families  3 cr
This course prepares students to work with families of children with special needs. It contains information on understanding families, working with traditional and non-traditional families, and providing family-centered services.

SPE 588  Advanced Practicum Experience  3 cr
The purpose of this course is to provide a field experience focusing on evaluation and program improvement in academic and behavioral assessment, program planning, and experiences in implementation of special education programming.
Pre-requisite: EDM 510 Minimum Grade of C.

SPE 589  Pre-Practicum Experience  3 OR 6 cr
Supervised experience in the teaching field which allows the teacher's performance to be evaluated qualitatively.

SPE 590  Sp Top -  3 cr
Supervised experience in the teaching field which allows the teacher's performance to be evaluated qualitatively.

SPE 591  Multicategory Prac Seminar  3 cr
Combines field experiences and technology-based simulations and learning experiences with an ongoing seminar to address a wide-range of disabilities and educational implications. Course content will be individualized according to the students educational and professional background.

SPE 592  Collaborative Pract-Seminar  3 cr
A seminar which enables students to discuss controversial issues related to the role and function of the collaborative teacher. Students lead and respond to discussion on topics which include teaming, inclusion, and collaboration.

SPE 593  Classroom Exp Prac -  3 cr
Supervised experience in the teaching field which allow the teacher's performance to be evaluated qualitatively.

SPE 594  Dir St - Research  3 cr
Students explore through directed individual study and research, problems and issue of special interest or significance in Special Education.
SPE 595  Intern/Prac SPE Coll Tch K-6  3 OR 6 cr
Supervised experiences in Collaborative Teaching K-6 in the teaching field which allow the teacher’s performance to be evaluated qualitatively.

SPE 596  Intern/Prac SPE Coll Tch 6-12  3 OR 6 cr
Supervised experiences in Collaborative Teaching 6-12 in the teaching field which allow the teacher’s performance to be evaluated qualitatively.
Pre-requisite: SPE 500 Minimum Grade of B and SPE 514 Minimum Grade of B and SPE 512 Minimum Grade of B and SPE 516 Minimum Grade of B and SPE 515 Minimum Grade of B and SPE 591 Minimum Grade of B or PRAXIS-Elem Ed Cont Knowledge 137 or PRAXIS-Elem Ed Cont Knowledge 137 or PRAXIS-Elem Ed-Read/Lang Arts 165 or PRAXIS-Elem Ed-Math Sub 157 or PRAXIS-Elem Ed-Soc Stu- Sub 142 or PRAXIS-Elem Ed-Science- Sub 144 or PRAXIS-Read/Lang Arts Subtest 154 or PRAXIS-Mathematics Subtest 143 or PRAXIS-Social Studies Subtest 142 or PRAXIS-Science Subtest 144.

SPE 597  Intern/Prac SPE ECSE  3 cr
Supervised experiences in Collaborative Teaching ECSE in the teaching field which allow the teacher’s performance to be evaluated qualitatively.
Pre-requisite: PRAXIS-Elem Ed Cont Knowledge 137

SPE 598  Intern/Prac SPE G/T  3 cr
Supervised experiences in Collaborative Teaching Gifted/Talented in the teaching field which allow the teacher’s performance to be evaluated qualitatively.

SPE 599  Thesis  3 cr
A student selects a project, study, or investigation in Special Education related to the student’s area of specialization. The project forms a basis for the thesis. A thesis committee will give guidance during the investigation and during the writing of the thesis.

SPE 601  Advanced Eval in SPE  3 cr
Methods and procedures for developing criterion-referenced instruments and assessment batteries for classroom use in evaluating exceptional children and youth.

SPE 609  Adv Study of Excep Children  3 cr
Comparison of the normal development progress and that usually seen in the various exceptionality categories of special education especially cognitive, communication, motor, social and emotional development.

SPE 641  Seminar Behav Disorders  3 cr
Advanced study and review of the state of present knowledge in areas relevant to the psycho-pathological disorders of childhood including etiology, assessment, treatment and education.

SPE 642  Clinical Teaching I  3 cr
A study of the principles of behavioral theory upon which strategies for change in cognitive and social behavior rest and the evaluative designs used to monitor behavioral change and validate strategies.

SPE 643  Clinical Teaching II  3 cr
A study and review of clinical research relevant to the curriculum requirements in the education and treatment of exceptional children and the identification of research needs in the various areas of exceptionality.

SPE 651  Seminar in LD  3 cr
Current trends and issues in the education of learning disabled individuals are discussed, various theoretical approaches and current empirical evidence provide the basis for discussion.

SPE 671  Seminar in ID Educ  3 cr
Current trends and issues in the education of individuals with intellectual disabilities. Class and recent professional literature are the basis for developing perspectives.

SPE 690  Sp Top -  3 cr
A course with varying content dealing with issues, trends, and topics of current interest in the field of education exceptional individuals. May be repeated for credit when course content varies.

SPE 694  Dir St - Research  3 cr
Students explore through directed study problems and issues of special interest or significance in Special Education.

SPE 699  Research Project  1 TO 3 cr
The Research Project, as the culminating experience in the Specialist Program, provides an opportunity for the candidate to synthesize and apply the various program components in a selected instructional setting. Suitable agreements are reached with the appropriate public school system by the candidate. MR majors may not take more than 8 hours.
Pre-requisite: IDE 692 Minimum Grade of B or EDU 692 Minimum Grade of B.

Speech Language Pathology (SLP)

SLP 596L  Clin Pract Sp-Lang Path Lab  1 TO 3 cr
Supervised clinical experience in Speech-Language Pathology. May be repeated.
SLP 510  Intro to Research Design  3 cr
A general presentation of research procedures. The student
will learn to read and evaluate professional literature and
develop a research prospectus.

SLP 521  Advanced Speech Science  3 cr
The study of physical and acoustic concepts involved in
speech production and perception including instrumental
measurement and analysis.

SLP 532  Clinical Linguistics  3 cr
This course gives the student an overview of the linguistic
theories and approaches that are relevant to the field of
speech sciences. There will be a particular emphasis on
those areas of linguistics that underpin the diagnostic and
assessment procedures used in Speech Pathology. The
course will focus on development and language use in
normal populations and will show how knowledge of the
pattern of typically developing language users can be
applied to clinical contexts.

SLP 533  Pediatric Language Disorders  3 cr
Clinical assessment and management of language problems
in infants, toddlers, and preschoolers, including language
disorders associated with other developmental disorders
and AAC.

SLP 534  School-Aged Language Disorders  3 cr
This course covers assessment and intervention
approaches for school-age language disorders, children
beyond age 5 years. Topics include speech-language
services at the discourse level; the relationship between
language and literacy; service delivery models including
integration; educational laws and policies.

SLP 541  Adv Articulation Disorders  3 cr
Advanced study of disordered speech-sound production
including these: development, assessment and intervention
of articulation and phonological disorders in children.

SLP 551  Voice and Resonance Disorders  3 cr
Advanced study of pathology, symptomatology, etiology,
and treatment of voice and resonance disorders in children
and adults.

SLP 561  Fluency Disorders  3 cr
Study of theories, research, and contemporary treatment
procedures in the area of fluency disorders.

SLP 565  Neuromotor Disorders of Commun  3 cr
Review of neuroanatomy and physiology, nature of
neuromuscular pathologies, methods of assessment and
rehabilitation of neuromotor disorders of speech production.

SLP 566  Aphasia & Neuro Lang Disorders  3 cr
Study of the nature, characteristics, and clinical
management of acquired neurogenic language disorders
associated with focal lesions to the left or right hemisphere,
including aphasia and right hemisphere syndrome.

SLP 567  Acq Cognitive Comm Disorders  3 cr
Study of the nature, characteristics, and clinical
management of cognitive-communication disorders
associated with diffuse brain lesion, including traumatic
brain injury and dementia.

SLP 568  Dysphagia  4 cr
This course provides an in-depth study of healthy and
disordered swallowing function across the lifespan.
Specifically, students will learn normal anatomy and
physiological processes of the upper aerodigestive tract,
how to conduct clinical and instrumental evaluations of
swallowing function, and develop individualized, targeted
treatment plans for various swallowing impairments.

SLP 588  Audiology for Speech-Lang Path  3 cr
This course will address the SLP scope of practice,
audiological tests, amplification, report literacy, and special
topics. An interprofessional team approach with audiology
will address co-management of services in individual with
communication disorders.

SLP 590  Dir Independent Research -  1 TO 3 cr
Independent research under the direction of a graduate
faculty member. May be repeated. Requires permission of
the instructor and the Graduate Advisor.

SLP 592  Seminar in Comm Disorders -  1 TO 10 cr
This course is designed to provide the opportunity for in-
depth study of special interests. Requires permission of the
Graduate Advisor.

SLP 594  Independent Study  1 TO 3 cr
Independent study under the direction of a graduate
faculty member. May be repeated. Requires permission of
instructor and Graduate Advisor.

SLP 596  Clin Pract Speech-Lang Pathol  1 TO 3 cr
Discussion of instrumentation, procedures, and approaches
to assessment and intervention in speech-language
pathology.
Co-requisite: SLP 596L

SLP 597  Off-Campus Clinical Practicum  3 TO 5 cr
Students will complete a 14-week, part time clinical
practicum at an off-campus site.
Pre-requisite: SLP 596 Minimum Grade of B.

SLP 598  Clinical Externship  1 TO 12 cr
Supervised clinical experience in a professional service
facility.

SLP 599  Thesis  1 TO 3 cr
One to three credits per semester with a maximum of
three hours credit. Regular standing required. Requires
permission of the Graduate Advisor.
Speech And Hearing Sci (SHS)

SHS 201 Intro to Comm Disorders 3 cr
Overview of major disorders of human communication and the role of the Audiologist and Speech-Pathologist in assessing and treating them.

SHS 302 Audiology and Hearing Sciences 3 cr
This course addresses basic principles of hearing science, including the physical properties of sound, sound generation, transmission, and measurement, anatomy and physiology of the hearing mechanisms; an introduction to the profession of audiology.

SHS 315 Fundamentals of Speech Science 3 cr
An introduction to the anatomy and physiology of speech production and the acoustic properties of speech.

SHS 331 Normal Language Acquisition-W 4 cr
Acquisition of communicative behavior in normal children during the first decade of life; development of syntax, semantics, pragmatics, cognition; clinical laboratory experience with children.
Pre-requisite: SHS 341 Minimum Grade of C.

SHS 341 Clinical Phonetics 4 cr
Transcription techniques for the analysis of speech. Includes a study of the dynamics of speech sound production.
Pre-requisite: (SHS 201 Minimum Grade of C or SHS 301 Minimum Grade of C). SHS 201 and SHS 301 can be taken concurrently with this course.

SHS 373 Audiology I 3 cr
This course is an introduction to the following topics: disorders of hearing, etiologies of auditory and vestibular disorders found in populations of all ages, and evaluation techniques used by audiologists.
Pre-requisite: SHS 302 Minimum Grade of C.

SHS 374 Audiology II 3 cr
This course is a study of the principles of the management of hearing loss in children and adults; relevant legislation; and treatment and education options.
Pre-requisite: SHS 373 Minimum Grade of C.

SHS 414 Neurobiol Bases Human Comm 3 cr
Introduction to neuroscience and clinical neurology as they apply to the processes of normal and disordered communication. Topics include neurophysiology, neuroanatomy, and neuropathologies.
Pre-requisite: SHS 315 Minimum Grade of C and SHS 331 Minimum Grade of C and SHS 341 Minimum Grade of C.

SHS 431 Intro to Language Disorders 3 cr
A survey of language disorders in preschool and school-age children; assessment and intervention.
Pre-requisite: SHS 331 Minimum Grade of C.

SHS 453 Intro to Speech Disorders 3 cr
An introduction to disorders of articulation, voice, and fluency. Theoretical and etiological foundations will be surveyed as well as philosophical orientations to therapy. Pre-requisite: SHS 315 Minimum Grade of C and SHS 341 Minimum Grade of C.

SHS 480 Issues in Clinical Pract - W 4 cr
Introduction to the clinical setting; organizations and statutes that govern professional service; instrumentation, procedures and approaches to remediation. Observation of therapy and indirect participation as a clinical aide are also a major part of this course. Special permission is required from instructor to take course.
Pre-requisite: SHS 331 Minimum Grade of C and SHS 341 Minimum Grade of C and SHS 431 Minimum Grade of C.

SHS 490 Special Topics - 1 TO 3 cr
Topics to be determined by student need and interest. Content will vary. A subtitle identifying the topic will be entered on the student’s record. May be repeated for a total of 6 hours. Requires permission of the department chair.

SHS 494 Directed Independent Study 1 TO 3 cr
Independent study under the direction of a faculty member. Requires permission of the department chair.

SHS 499 Senior Honors Project - H - W 1 TO 6 cr
Under the advice and guidance of a faculty mentor, honors students will identify and carry out a research project relevant to the field of Speech Pathology and Audiology. The senior project will be judged and graded by three faculty members chaired by the honors mentor. This course is required for Honors recognition. Permission of the department chair and completion of an approved project prospectus is required.

Sports Management (SM)

SM 572 Sport Event Law and Risk Mgmt 3 cr
Analytical understanding of legal issues and risk management trends as they relate to sport event management. Legal systems, human resource management, operations management, and liability of managing sport events and facilities will be emphasized.

SM 575 Sport Ldshp and Org Behavior 3 cr
This course explores the essential functions of leadership in the management of sport organizations and sport events. Effective leadership in event operations will be studied, in addition to historical and current perspectives of organizational behavior. Students will gain an advanced understanding of practical leadership applications.

SM 584 Sport Event Marketing-Media 3 cr
Study of the unique features of sport event marketing and media. Examines the strategies and activities or organizations to promote and produce sporting events.
SM 585  Soc-Ethic Issues in Sport Mgmt  3 cr
A variety of social and ethical issues within the sport industry are presented. A value based approach to sport event decision making is emphasized using real-world examples and the application of ethical theories.

SM 586  Sport Event and Facility Mgmt  3 cr
Designed to provide students the opportunity to learn multiple aspects of sports event management and the operations of sports facilities. Emphasis toward how to plan, manage, implement and evaluate sports events at various host site venues.

SM 587  Sport Business and Finance  3 cr
This course provides sport managers with the skills to make effective financial management decisions in sport event settings. Students will apply appropriate investment, revenue generating, and budgeting concepts unique to the sport industry.

SM 594  Directed Study and Research  3 cr
Students explore through directed study and research, problems and issues of special interest or significance in sport management. Not more than three semester hours of SM 594 can be accepted toward a degree program. Program advisor approval required.

SM 595  Internship in Sport Management  3 TO 6 cr
A supervised learning experience in a sport management or related agency work setting. Provides the student with an opportunity to apply theories and concepts learned during the graduate program. No more than six semester hours of SM 595 can be accepted toward a degree program. Program advisor approval required.

SM 599  Thesis  1 TO 6 cr
Independent research by the student under the sponsorship of the graduate faculty. Approved formal research prospectus and approval by thesis committee chair required.

Statistics (ST)

ST 150  Contemporary Math-Stat Seminar  1 cr
This course gives an overview of modern mathematics and statistics from the point of view of the practitioners. The course is designed for majors in mathematics and statistics at all levels as well as those students who are considering mathematics and statistics as a major or minor area of study. Topics usually included are elements of geometry, algebra, analysis, methods of statistical inference, the role of the computer in the analytical sciences; these topics vary from semester to semester. This course cannot be taken for credit simultaneously with MA 150, but may be repeated in different semesters. NOTE: May be offered for Honors Credit.

ST 210  Stat Reason and Application  3 cr
An introduction to modern statistics designed to provide the student with a solid foundation in statistical concepts, reasoning and applications. Emphasis given to problem identification, methodology selection and interpretation of results. Analysis of data accomplished by extensive use of statistical computer software, thereby minimizing manual computation. Coverage includes descriptive statistics, probability models, estimation, and hypothesis testing. High School level algebra is recommended. Computer Lab fee. NOTE: ST 210 is intended for students in all disciplines except Engineering and Computer Science. Credit for both ST 210 and ST 315 not allowed. May be offered for Honors Credit.

ST 305  Applied Stat Health Sciences  3 cr
An introduction to statistical reasoning and data analysis for the health sciences. Coverage includes descriptive statistics, methods of data collection, estimation, hypothesis testing, non-parametric statistics, ANOVA, repeated measures, correlation and other measures of association, modeling data with linear and logistic regression. Critique of selected research articles and case studies incorporating research and evidence-based practice will be adopted to connect statistics to daily work in healthcare field. Statistical computer software (e.g. Minitab) will be extensively used for data analysis. Computer Lab fee. Note: This course is offered only as a fully online course and only for health sciences students.
Pre-requisite: MA 110 Minimum Grade of C or MA 112 Minimum Grade of C.

ST 310  Stat Research Techniques  3 cr
This course is a continuation of ST 210. Coverage includes analysis of experimental designs such as completely randomized design, randomized block design, and factorial design using analysis of variance (ANOVA), correlation, simple and multiple regression analysis, model building, nonparametric techniques, contingency table analysis, sampling and survey methods. Time permitting topics such as time series analysis and statistical simulations will be covered. Statistical computer software will be extensively used for data analysis. Computer Lab fee. NOTE: Credit for only ONE course from ST 310, ST 315 and ST 320 is allowed.
Pre-requisite: ST 210 Minimum Grade of C.

ST 315  Applied Probability-Statistics  3 cr
Concepts of probability theory, discrete and continuous probability distributions including gamma, beta, exponential and Weibull, descriptive statistics, sampling, estimation, confidence intervals, testing of hypothesis, ANOVA and multiple comparisons, linear and multiple regression, correlation, nonparametric analysis, contingency table analysis, computer-assisted data analysis using appropriate statistical software. Computer Lab fee.
Pre-requisite: MA 125 Minimum Grade of C.
ST 320  Applied Stat Analysis  3 cr
Descriptive statistics, probability distributions, sampling, estimation, confidence intervals and hypothesis testing, experimental designs, ANOVA and multiple comparisons, linear and multiple regression, correlation, nonparametric analysis, goodness of fit, contingency table analysis, quality control, acceptance sampling, computer-assisted data analysis using appropriate statistical software. Computer Lab fee. NOTE: ST 315 and ST 320 are intended for students in Engineering, Computer Science, and Mathematics. ST 315 covers additional probability distributions while ST 320 additionally covers concepts of quality control and acceptance sampling. Students in these disciplines should consult with their academic advisor for appropriate choice between ST 315 and ST 320. Computer Lab fee. NOTE: Credit for only ONE course from ST 310, ST 315, and ST 320 is allowed.
Pre-requisite: MA 125 Minimum Grade of D.

ST 335  Applied Regression Analysis  3 cr
Simple, polynomial and multiple linear regression; residual and lack-of-fit analysis; simple, multiple, partial and multiple-partial correlation analysis; model building algorithms; dummy variables; analysis of covariance; model comparisons; analysis of experimental designs including messy data; nonlinear regression models; computer-assisted data analysis using appropriate statistical software. Computer Lab fee. NOTE: Satisfies the Technology Proficiency Requirement for Math/Stat majors.
Pre-requisite: ST 210 Minimum Grade of C or ST 315 Minimum Grade of C or ST 320 Minimum Grade of C.

ST 340  Design-Analysis of Experiments  3 cr
Principles, constructions, and analysis of experimental designs to include completely randomized, randomized complete block, Latin square and split plot designs, factorial experiments, designs with nested and/or crossed factors, multifactor experiments with randomization restrictions, transformations, incomplete block designs, multiple comparisons including contrasts, confounding, fractional replication, computer-assisted data analysis. Computer Lab fee.
Pre-requisite: ST 210 Minimum Grade of C or ST 310 Minimum Grade of C or ST 315 Minimum Grade of C or ST 320 Minimum Grade of C.

ST 345  Sampling-Survey Techniques  3 cr
Sampling concepts and designs for survey investigations; sampling methodologies including applications of simple random, stratified, one-and-two stage cluster, and systematic sampling; sample size determination; ratio and regression estimation; population size estimation; random response modeling; acceptance sampling including applications of single and multiple 2-class attribute sampling plans; computer-assisted data analysis using appropriate statistical software. Computer Lab fee.
Pre-requisite: ST 210 Minimum Grade of C or ST 310 Minimum Grade of C or ST 315 Minimum Grade of C or ST 320 Minimum Grade of C.

ST 350  Applied Time Series Analysis  3 cr
Fundamental concepts; classical regression models as forecasting models, exponential smoothings, stationary and nonstationary models, additive and multiplicative decompositions, moving average, autoregressive, ARMA and ARIMA processes, estimation in MA, AR ARMA, and ARIMA processes. Box-Jenkins methodology, computer aided modeling, applications. Computer Lab fee.
Pre-requisite: ST 210 Minimum Grade of D or ST 315 Minimum Grade of D or ST 320 Minimum Grade of D or ST 335 Minimum Grade of D.

ST 355  Nonparametric Stat Methods  3 cr
Distribution-free analysis of location and scale measures, nonparametric treatment of fundamental statistical designs, nonparametric comparison procedures, association and contingency table analysis, nonparametric goodness-of-fit procedures, and tests for randomness, nonparametric regression and other measures of association, computer intensive statistical methods. Computer Lab fee.
Pre-requisite: ST 210 Minimum Grade of D or ST 315 Minimum Grade of D or ST 320 Minimum Grade of D.

ST 415  Stat Qual Control Reliability  3 cr
Probability distributions in quality control, inferences about process quality, control charts for attributes and variables, process capability analysis, economic design of control charts, custom charts, acceptance sampling by attributes and variables, six sigma concepts, reliability concepts, censoring, definitions and properties of survival distributions, methods of estimating and comparing reliability distributions, Kaplan-Meier estimation, burn-in models with a major emphasis on computer-assisted data analysis. Computer Lab fee.

ST 425  Applied Linear Models  3 cr
Some results of matrix algebra, multivariate normal distributions, distributions of quadratic forms, general linear models, design models with one factor and two factors including interaction, component-of-variance models, and computing techniques. Computer Lab fee.
Pre-requisite: MA 237 Minimum Grade of D and ST 335 Minimum Grade of D or ST 320 Minimum Grade of D.

ST 450  Categorical Data Analysis  3 cr
Analysis of two-way, three-way and higher dimension contingency tables using log-linear models, measures of association for nominal and ordinal tables, multiple-factor models, multiple response models, logistic regression, and weighted least squares. Computer Lab fee.

ST 460  Multivariate Stat Analysis  3 cr
Multivariate normal distribution, sampling distribution, hypothesis testing, principal components and introduction to factor analysis, canonical correlation analysis, discriminant and classification analysis, and MANOVA. Computer Lab fee.
ST 470 Theory of Statistics
A comprehensive introduction to the mathematical foundations of statistics. Sufficient statistics and information. Parameter estimation, maximum likelihood and moment estimation, optimality properties of estimators and confidence intervals. Hypothesis testing, likelihood ratio tests and power functions. Credit for both ST 470 and MA 551 is not allowed.
Pre-requisite: MA 451 Minimum Grade of D or MA 550 Minimum Grade of D.

ST 475 Stat Computing and Graphics
Introduction to computer-assisted data analysis with statistical computer software, including SAS, R/S-Plus. Coverage includes basics of SAS, common SAS statistical procedures, high-dimensional data visualization, some elements of statistical computing such as numerical computation, semi-numerical computation, symbolic and graphical computation, and special topics selected by instructor. (Credit for ST 475 and ST 575 is not allowed.
Computer Lab fee.
Pre-requisite: ST 210 Minimum Grade of C or ST 315 Minimum Grade of C or ST 540 Minimum Grade of C.

ST 480 Statistical Practicum - W
Relates to the student's classroom studies with actual statistical problems encountered in practice. Working with the departmental statistical consultant, the student will participate in providing statistical assistance to research faculty in applied fields. Computer Lab fee.
Pre-requisite: and ST 335 Minimum Grade of C and ST 340 Minimum Grade of C.

ST 490 Special Topics
Selected topics in advanced undergraduate applied statistics. This course may be repeated for a maximum of six credits.

ST 494 Directed Studies
Directed Study. May be repeated for a maximum of six credits. Prerequisite: Permission of Department Chair.

ST 499 Honor Senior Project - H
With the guidance and advice of a faculty mentor, Honors Students will identify, and carry out a research project in Statistics. The outcome of the research project will include a formal presentation at the annual Honors Student Colloquium. The senior project will be judged and graded by three members of the faculty, chaired by the faculty mentor.

ST 525 Appl Stat for Clinical Trials
This course introduces the fundamental concepts of clinical trials and statistical methods in clinical trials with examples. Topics include clinical trial design and development, randomization, blindness, sample size and power calculation, data collection and management, missing data, survival analysis, association and reproducibility, crossover trials, Bayesian adaptive methods, and others. Most of the statistical methods will be implemented using R. Procedures or subroutines from other statistical software packages, such as SAS and SPSS, will also be introduced as needed.
Pre-requisite: ST 210 Minimum Grade of C or ST 305 Minimum Grade of C or ST 315 Minimum Grade of C or ST 540 Minimum Grade of C.

ST 540 Stat in Research I
A service course for graduate students in disciplines other than mathematics and statistics. A non-calculus exposition in support of application. Coverage includes descriptive statistics, probability and probability distributions, sampling, estimation, tests of significance, analysis of variance, correlation, linear, polynomial, and multiple linear regression including residual and lack of fit analysis, nonparametric procedures, contingency table analysis, and computer-assisted data analysis using appropriate computer software. Computer Lab fee.

ST 545 Stat in Research II
Continuation of ST 540. Coverage includes regression analysis through matrices, multiple, partial and multiple-partial correlation analysis, model building algorithms, non-linear regression, analysis of covariance, completely randomized, randomized complete block, and factorial experimentation for equal and unequal cell replication, logistic regression, resampling, basic multivariate techniques, and computer-assisted data analysis. Computer Lab fee.
Pre-requisite: ST 540 Minimum Grade of C.

ST 550 Environmental Statistics
Sampling environmental populations; parametric and nonparametric estimation; applications of lognormal, Weibull, gamma and beta distributions; locating hot spots; censored data; outlier detection; trend analysis, seasonality; estimation of animal abundance. Computer Lab fee.
Pre-requisite: ST 210 Minimum Grade of C or ST 315 Minimum Grade of C or ST 540 Minimum Grade of C.

ST 555 Categorical Data
Introduction to categorical response data, probability distributions for categorical data, statistical inference for proportions, contingency tables and measures of association, logistic regression, log-linear models for contingency tables, multi-category response models, models for matched pairs categorical response variables. Credit for both ST 450 and ST 555 is not allowed.
Pre-requisite: ST 540 Minimum Grade of C or ST 315 Minimum Grade of C or ST 335 Minimum Grade of C.
ST 560  Appl Design & Analysis of Exper  3 cr
A software aided introduction to the design and analysis of experiments for univariate and multivariate data. The coverage includes designs such as block designs, factorial designs, repeated measurement designs, hierarchical designs, response surface methods, and Taguchi methods along with various ANOVA techniques for univariate data, ANCOVA for the correlated data, and MANOVA for multivariate data. Analysis of data will be accomplished by extensive use of statistical software. Computer lab fee. Pre-requisite: ST 540 Minimum Grade of B.

ST 575  Stat Computing and Graphics  3 cr
Introduction to computer assisted data analysis with statistical computer software, including SAS, R/S-Plus. Coverage includes basics of SAS, common SAS statistical procedures, high-dimensional data visualization, some elements of statistical computing such as numerical computation, semi-numerical computation, symbolic and graphical computation, and special topics selected by instructor. (Credit for both ST 475 and ST 575 is not allowed. Computer Lab fee.
Pre-requisite: (ST 540 Minimum Grade of C or ST 315 Minimum Grade of C or ST 210 Minimum Grade of C).

ST 580  Stat Learning Tech in Data Sc  3 cr
Statistical learning refers to a set of tools for modeling and understanding complex datasets. It is a recently developed area in statistics and blends with parallel developments in computer science and, in particular, machine learning. The purpose of this course is to provide the student with a foundation in modern (non-traditional) statistical learning techniques to deal with small to large complex datasets. Analysis of data is accomplished by extensive use of statistical software thereby minimizing manual computation. Coverage includes introduction to statistical learning, classification or supervised learning methods, resampling methods, linear and non-linear model selection techniques, support vector machines and tree-based methods. Pre-requisite: ST 540 Minimum Grade of C.

ST 585  Nonparametric Modeling  3 cr
This course is designed to introduce an alternative set of methodologies to existing and non-existing statistical methods with emphasis on distribution-free and robust procedures. The coverage includes distribution-free analysis of location and scale measures. Nonparametric treatment of fundamental statistical designs, nonparametric multiple comparison procedures, association and contingency table analysis, goodness-of-fit procedures. Nonparametric regression and other measures of association and computer intensive methods. Statistical computer software is intended to enhance the facility with applications of various techniques covered in this course.
Pre-requisite: ST 335 Minimum Grade of C and ST 540 Minimum Grade of C.

ST 590  Sp Topic:  1 TO 3 cr
Selected topics in advanced applied statistics. This course may be repeated for a maximum of six credits.

Systems Engineering (SE)

SE 500  Engr Probability & Statistics  3 cr
Probability and statistical concepts; discrete, continuous, and joint distributions; point and interval estimation; hypothesis testing; regression and correlation analysis; analysis of variance.

SE 501  Engineering Optimization  3 cr
Model construction, linear programming, network models, dynamic models, stochastic models, queuing theory, and decision theory.
Pre-requisite: SE 500 Minimum Grade of B. SE 500 can be taken concurrently with this course.

SE 601  Systems Eng Fundamentals  3 cr
Fundamentals of systems engineering, structure of complex systems, system development process, systems engineering management and documentation, needs analysis, requirements development, engineering design and development, integration and test, change management, process improvement. Fee.

SE 602  Risk and Failure Analysis  3 cr
Risk Analysis needs, risk analysis methods, performance requirement analysis, trade studies, failure analysis needs, failure analysis tracking, and failure analysis methods.
Pre-requisites: Requires a background in calculus-based statistics and permission of instructor. Fee.

SE 603  Integration, Test & Evaluation  3 cr
Interface control documents, design reviews, requirements management, allocation of test methods to requirements, test plans, test procedures, test execution, and failure tracking and resolution. FEE
Pre-requisite: SE 601 Minimum Grade of C.

SE 604  Software Systems Engineering  3 cr
Software development methodologies, software development tools, change management, software concept development, software requirements development and allocation, coding and unit test, program technical interfaces, software engineering management. Fee.
Pre-requisite: SE 601 Minimum Grade of C.

SE 605  Project Engineering  3 cr
Management of system design, development and risk, work breakdown, structure, systems engineering management plan, design reviews, budget and schedule analyses, negotiation and conflict resolution, contracts, customer interactions, team selection, failure resolution. Fee.
SE 606  Systems Architecture  3 cr
The systems architecture is that foundational structure of a system, capturing the core capability and structure of the system. This course will cover principles of systems architecting, system architecture drivers, relationship of systems architecture to system requirements, common tools and techniques to include design structure matrices, IDEF0, SysML, and simulation. Pre-requisite: SE 601 Minimum Grade of C.

SE 607  Systems Simulation  3 cr
This course rigorously examines system modeling and simulation methodologies, emphasizing statistical analysis and discrete-event simulation via simulation software.

SE 608  Reliability Engineering  3 cr
This course rigorously examines reliability and maintainability methodologies, emphasizing mathematical constructs, design concepts, and data analysis employed to quantify reliability, availability, and maintainability measures for operational readiness, support system design, and system effectiveness.

SE 609  Engineering Research Methods  1 TO 3 cr
This course is a fast tracked course examining quantitative and qualitative methods for conducting meaningful inquiry and research. Topics include research ethics, intent, design, methodologies, techniques, formatting, data management, analysis, publication, and presentation utilizing common statistical approaches.

SE 610  Systems Thinking  3 cr
The act of systems thinking is taking a step back from the details considered during engineering design, and looking at the whole picture. This class exposes the student to a conceptual framework to allow them to properly define complex systems and enterprises drawing from synthesizing techniques from systems science, soft systems methodologies, and systems engineering. The class demonstrates the ability to leverage the simultaneity of perspectives, the role of paradox, and the centrality of soft issues in resolving complexity.

SE 611  Socio-Technical Systems  3 cr
Socio-Technical systems are those systems which contain and/or are strongly influenced by human, social and institutional elements. Because of those influences, they quickly become dependent on community partnerships, infrastructure constraints, and government-aspects that are not traditionally part of the engineering equation. This course considers the systems engineering approach as it relates to the challenges of socio-technical systems. Pre-requisite: SE 601 Minimum Grade of C.

SE 612  Production System Engineering  1 TO 3 cr
This course rigorously examines principles, design, models and techniques for operational planning and analysis of production and distribution systems emphasizing quantitative methods.

SE 690  Special Topics in SE  3 cr
Topics of current interest in Systems Engineering. Fee.

SE 692  Directed Studies  3 cr
Directed study, under the guidance of a faculty advisor, of a topic from the field of Systems Engineering not offered in a regularly scheduled course. Prerequisite: Instructor's permission.

SE 699  Dissertation  1 TO 6 cr
An investigation of an original problem in Systems Engineering under the guidance of the student's major professor. Prerequisite: Approval of the dissertation prospectus by the student's Advisory Committee, the Graduate School, and consent of the Director of Engineering Graduate Studies.

Undergraduate Research (UGR)

UGR 091  Research:  0 cr
Research project or creative activity for current high school students under the direct mentorship of faculty member.

UGR 191  Research:  0 cr
Research project or creative activity for first-year students under the direct mentorship of a faculty member.

UGR 291  Research:  0 cr
Research project or creative activity under the direct mentorship of a faculty member for students in the junior year of their academic programs.

UGR 391  Research:  0 cr
Research project or creative activity under the direct mentorship of a faculty member for students in the senior year of their academic programs.

UGR 491  Research:  0 cr
Research project or creative activity under the direct mentorship of a faculty member for students in the senior year of their academic programs.