LING 680  INTRODUCTION TO SOCIOLINGUISTICS  3  
Theories (e.g., variation theory), research and methods of analysis of the interrelationships of language and society. Particular attention paid to application of sociolinguistic research to the solution of educational problems of various groups.

LING 691  SEMANTICS I  3  
Introduction to linguistic theories of meaning. Survey of the semantic issues in reference, ambiguity, presupposition and implication. Selected linguistic phenomena (e.g., tense, aspect, predication and thematic roles). Some elements of formal semantics.
PREREQ: LING101 or equivalent.

LING 697  SOCIOLINGUISTICS OF ENGLISH IN THE INNER CITY  3  
Application of sociolinguistic principles and research to the teaching of multicultural students in American educational systems. Topics include sociolinguistic, language attitudes, vernacular language education, diglossia, instructional methods for teaching English as a second dialect, and reactions of the educational community to Black English Vernacular.

LING 698  TEACHING ENGLISH AS A SECOND LANGUAGE  3  
Investigation of the literature containing the traditional and modern techniques of teaching the pronunciation, grammar and vocabulary of American English. Devising and presenting lesson plans.
PREREQ: Three credits of English at the 200-level.

LING 699  ISSUES IN TEACHING LIMITED ENGLISH PROFICIENT STUDENTS  3  
Addresses theoretical and instructional issues related to teaching Limited English Proficient (LEP) students. Topics include issues in bilingual education, theories of L2 acquisition, LEP educational models, integrating language and content instruction, documentation and assessment of LEP skills, and understanding cultural diversity.

LING 801  LINGUISTIC TYPOLOGY  3-6  
Introduction to the concepts of linguistic typology and the study of language universals and language documentation.
COREQ: LING607, LING609.

LING 802  STUDIES IN OLD AND MIDDLE ENGLISH  3  
See ENGB802 for course description.

LING 830  SYNTAX III  3  
In-depth investigation of syntactic universals and recent developments in the theory of syntax.
PREREQ: LING610.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 831  TOPICS IN SYNTAX  3  
Current topics in syntactic theory, problems in the syntactic analysis of specific languages.
PREREQ: LING830.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 832  THE ACQUISITION OF SYNTAX  3  
Current issues in the acquisition of syntax, such as: relationship between UG and specific language grammars, parameter setting model in L1 acquisition, effect of input frequency, methods for assessing children's syntax.
PREREQ: Syntax I and II, or concurrent enrollment in Syntax II.

LING 848  SEMINAR IN LANGUAGE DEVELOPMENT  3  
See EDUC848 for course description.

LING 850  LINGUISTICS AND WRITING  3  
Survey of writing systems. Problems of text structure.

LING 851  LINGUISTIC FIELD METHODS  3  
Development of skills and techniques in various kinds of field analysis. Use of native informants. Discussion of the relationship between data collecting and grammatical statement.

LING 853  TOPICS IN THE STRUCTURE OF CHINESE  3  
Formal analysis of selected aspects of the grammar of Chinese and related dialects. Topics may include phonology, morphology, syntax and semantics.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 854  TOPICS IN THE STRUCTURE OF FRENCH  3  
Formal analysis of selected aspects of the grammar of French and related dialects. Topics may include phonology, morphology, syntax and semantics.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 855  TOPICS IN THE STRUCTURE OF GERMAN  3  
Formal analysis of selected aspects of the grammar of German and related dialects. Topics may include phonology, morphology, syntax and semantics.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 856  TOPICS IN THE STRUCTURE OF ITALIAN  3  
Formal analysis of selected aspects of the grammar of Italian and related dialects. Topics may include phonology, morphology, syntax and semantics.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 857  TOPICS IN THE STRUCTURE OF JAPANESE  3  
Formal analysis of selected aspects of the grammar of Japanese and related dialects. Topics may include phonology, morphology, syntax and semantics.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 861  TOPICS IN PHONOLOGY  3  
Detailed examination of one or more current (controversial) issues in phonological theory.
PREREQ: LING608.
RESTRICTIONS: May be repeated for credit when topics vary.

LING 862  ACQUISITION OF PHONOLOGY  3  
Development of phonology in normal children from babbling stage through acquisition of phonemes and basic phonological rules of a language.
Examination of data from a variety of languages, focusing on language specific and universal phenomena.
PREREQ: LING608.

LING 863  PROJECTS IN ACOUSTIC PHONETICS  3  
Brief review of the articulatory, acoustic, and perceptual characteristics of speech and computer-based laboratory instrumentation. Students conduct research projects in acoustic phonetics, speech analysis, or speech synthesis. Projects will be suggested by the instructor, however, students may (with instructor's approval) choose a project of their own design.

LING 868  SECOND LANGUAGE ACQUISITION  3  
A detailed analysis of current issues in second language acquisition based on extensive readings of research findings. Topics include monitor model, pidginization process, natural versus formal second language acquisition, and adult-versus-child acquisition.

LING 890  STUDIES IN LINGUISTICS  3  
Varying topics in linguistics, such as grammatical theory, grammatical analysis, syntax, historical-comparative linguistics, stylistics and grammar testing.
May be cross-listed with CSGB890 and/or ENGB990.

LING 964  PRE-CANDIDACY STUDIES  2-12 PF  
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

LING 969  DOCTORAL DISSERTATION  1-12 PF  

LIBERAL STUDIES

MALS 600  NATURE AND HUMAN NATURE  3  
Concentrates on a select number of central issues. Among the central issues examined are: the nature of science, the nature of human nature, and the ways in which the two concepts have been related. The course will draw on a wide variety of disciplines, and will explore the work of a number of major figures in the history of thought.

MALS 610  FORCE, CONFLICT AND CHANGE  3  
From antiquity to the present, the use of force and the resolution of conflict have been among humanity's enduring preoccupations. Examines ideas about these issues, and associated questions such as the meaning of "heroism" and "just war."
RESTRICTIONS: Open to majors only.

MALS 611  DOCUMENTARY JOURNALISM AND FILM  3  
Explores non-fiction narratives, both in print and on film. It looks at social reporting from the Victorian Era to the present, drawing analogies between the techniques of literature and cinema.
RESTRICTIONS: Open to majors only.

MALS 613  LATIN AMERICAN EXPERIENCES  3  
Examines recurring issues and problems in Latin America. The conflict between church and state, nationalism and a place in world affairs, tension between the individual and society and the influence of the United States.
RESTRICTIONS: Open to majors only.

MALS 617  AMERICAN ART IN CONTEXT  3  
Designed to give the non-specialist in art history an understanding of how social, economic, religious, and cultural attitudes in America are reflected in its art, architecture, and decorative arts from the colonial period to the present. Discussion encompasses such subjects as patronage, regionalism, ethnicity, and gender.
RESTRICTIONS: Open to majors only.
MAST 619 THE SCIENTIST IN SOCIETY 3
Scientific research is directly influenced by the society in which it is conducted. In addition to financial limitations, constraints are imposed by societal norms of what are acceptable topics and procedures for research. Focus on the philosophical basis of science as well as consequences to society of the scientific revolution. RESTRICTIONS: Open to majors only

MAST 620 THE USE OF SCIENCE IN PUBLIC DISCOURSE 3
Examines important questions of general interest to both individuals and to governmental bodies that depend heavily on scientific information. RESTRICTIONS: Open to majors only

MAST 621 THE IMPACTS OF EUROPEAN CONTACTS ON NATIVE AMERICANS 3
Considers how the arrival of the first Europeans in North America affected the indigenous Native Americans. RESTRICTIONS: Open to majors only

MAST 622 INTERPRETING THE PAST 3
Considers the different perspectives that can be applied to learning about the past.

MAST 623 MOZART AND NOVERRE 3
Mozart’s contributions to opera and how they compare favorably to Noverre’s contributions to dance. Noverre’s letters reveal his innovative ideas about dance while several of the final apercu masterpieces of Mozart are useful examples to study and understand his musical, sociological and philosophical environment.

MAST 624 INTRODUCTION TO GRADUATE RESEARCH/WRITING IN LIBERAL STUDIES 3
Focuses on developing research and writing skills by concentrating on one issue, such as the family, the environment, or education. Students will be taught to narrow the focus of a topic, create an arguable thesis, gather source information from both library and on-line resources, evaluate the source of information, organize a logical argument, incorporate source information into the argument and revise into a finished paper. RESTRICTIONS: Open to majors only

MAST 625 FILM AND AMERICAN SOCIETY 3
 Using major motion pictures, explores how Hollywood dealt with critical historical events: the Cold War, McCarthyism, the Civil Rights Movement, Vietnam, Watergate, and the modern Presidency. RESTRICTIONS: Open to graduate majors only

MAST 626 STUDIES IN TWENTIETH CENTURY AMERICAN LITERATURE 3
Examines narrative and thematic concerns in American fiction written before and after World War II. The fiction is explored against a background of cultural, philosophical, and literary trends. RESTRICTIONS: For MALS students only

MAST 647 PHILOSOPHY OF TECHNOLOGY 3
See PHIL647 for course description

MAST 648 ENVIRONMENTAL ETHICS 3
See PHIL648 for course description

MAST 660 ON BECOMING HUMAN 3
Examines the biological and cultural evolution of humans, focusing on similarities and differences between humans and our closest primate relatives. RESTRICTIONS: Open to majors only

MAST 686 MASTER’S THESIS 1–6
MAST 879 SYNTHESIS PROJECT 1–6

MAST 464 MARINE SCIENCE SUMMER INTERNSHIP 1–3
Students design a research project with an advisor and present it to peers, advisors and course instructor.

MAST 466 INDEPENDENT STUDY 1–3

MAST 468 UNDERGRADUATE RESEARCH 1–6

MAST 482 INTRODUCTION TO OCEAN SCIENCES 3
A quantitative introduction to the ocean world including geography, geophysics, chemistry of water and sediments, physics of ocean circulation and waves and tides, description of oceanic and nearshore environments, and biology of the seas. PREREQ: MATH241 or MATH221; CHEM103 or CHEM111; PHYS201 or PHYS207

MAST 601 INTRODUCTION TO OCEANOGRAPHY 3
Topics include the geology and history of the ocean floor, oceanic sediments, the physics of the marine environment and the oceanic circulation, chemical processes in the ocean, and biological processes and production in the oceans. RESTRICTIONS: For non-oceanographers. Requires graduate status.

MAST 602 PHYSICAL OCEANOGRAPHY 3
Geographic and hydrodynamic aspects of oceanography. The geography of ocean basins; physical properties of seawater; radiation; and observed distributions of temperature, salinity, oxygen and currents. Scalar and vector fields; hydrostatics; kinematics; momentum dynamics; vorticity dynamics; viscous flow and eddy flux. RESTRICTIONS: Requires permission of instructor

MAST 603 INTRODUCTION TO MARINE AND AQUATIC EDUCATION 3
Water environments and associated marine and aquatic curricula are highlighted through inquiry learning, lecture and field trips. Emphasized is the integration of science, math, language arts, history and exploratories in development of thematic curricula. For inservice educators.

MAST 604 ENVIRONMENTAL DATA MANAGEMENT 3
Emphasizes the use of remotely sensed data for research and management of coastal resources. Environmental issues and data requirements are discussed. Case studies illustrate the use of Geographic Information Systems for integrating remotely sensed imagery with ancillary data to address coastal environmental problems. RESTRICTIONS: Requires approval of instructor

MAST 605 TOPICS: MARINE SCIENCE EDUCATION 1–4
Stimulates Delaware teachers into incorporating integrated marine sciences into their classroom teaching

MAST 606 OCEAN AND ATMOSPHERE REMOTE SENSING 3
Fundamentals of ocean and atmosphere remote sensing including space platforms, their orbits, instruments, data retrieval and image processing methods. Oceanographic and atmospheric applications of remote sensing and new developments in sensors and data analyses

MAST 607 WRITING PAPERS IN THE MARINE SCIENCES 3
The process and mechanics of publishing scientific papers in marine journals. Covers organizing data in tables and figures; mechanics of drawing up effective figures; marshaling of tables, figures and scientific ideas into a coherent story; and strategies and techniques used in effective writing.

MAST 615 INTRODUCTION TO MARINE BIOLOGY 3
Involves laboratory, field and lecture study for a broad understanding of marine biology and biochemistry. RESTRICTIONS: For non-biologically oriented marine studies graduate students

MAST 616 METHODS IN MOLECULAR BIOLOGY 3
Conceptual experience in molecular biological techniques with an emphasis on their application to marine related problems. Topics include: nucleic acid extractions, cloning, gene amplification and characterization, and expression methodologies. PREREQ: MAST634

MAST 617 METHODS IN MOLECULAR BIOLOGY LABORATORY 3
Provides practical experience in molecular biological techniques with emphasis on applications to marine related problems. COREQ: MAST616

MAST 618 MARINE MICROBIAL ECOLOGY 3
Examines role of microbes in the oceans and their impact on oceanographic processes and biogeochemical cycles in marine environments. Emphasis is on bacteria and their interactions with other marine organisms. Introduces use of molecular tools to examine uncultivated microbes. RESTRICTIONS: Requires permission of instructor.

LIBERAL STUDIES
MAST 679  SHIPPI NG AND PORT MANAGEMENT  3
A seminar to study the structure and management of the shipping industry and ports, policies for ocean commerce, international trade, and merchant marine. May be cross-listed with POSC679.

MAST 681  REMOTE SENSING OF ENVIRONMENT  3
Detection and mapping of land and ocean resources with optical, infrared and microwave sensors. Digital analysis of satellite images using multispectral and spatial analysis techniques and correlation with ground/ship data. Application to oceanography, coastal processes, geology, land use, geography, agriculture, climate and pollution studies. May be cross-listed with ELEG681 and/or GEOG681.

MAST 685  FUNDAMENTALS OF ACOUSTICS  3
Fundamentals of sound and vibration, including equations governing vibrating string, vibration of bars, two-dimensional wave equation in plates, acoustic wave equation, transmission phenomena and acoustic radiation and reception. Other topics include absorption and attenuation of sound, resonators and ducts and filters, in the context of environmental and underwater acoustics. PREREQ: Calculus and introduction to differential equations.

MAST 686  REMOTE SENSING SEMINAR  1
Basic and applied research topics in remote sensing of earth resources, coastal processes, estuarine productivity, ocean dynamics and climatic effects presented by University students, faculty and guest speakers. Stresses advanced data acquisition and spectral and spatial image analysis techniques. RESTRICTIONS: May be repeated for credit when topics vary.

MAST 691  OCEAN FLUID DYNAMICS  4
See CIEG639 for course description.

MAST 692  ENVIRONMENTAL VALUES, MOVEMENT, AND POLICY  3
Examines citizens' beliefs and values, voluntary environmental groups and the ways in which individuals and groups affect environmental policy. Shows how research in areas such as environmental sociology and ecological anthropology can inform policy. May be cross-listed with UAPP692.

MAST 693  WAVES IN THE MARINE ENVIRONMENT  3
General principles of wave mechanics, kinematics and dynamics. Applications to surface gravity waves, acoustic waves, electromagnetic waves and large scale geophysical waves. May be cross-listed with CIEG693.

MAST 800  DYNAMICAL PHYSICAL OCEANOGRAPHY  3
Topics include basic definitions, conservation of mass, conservation of momentum, conservation of vorticity, horizontal frictionless flow, wind-driven circulation, stability and double diffusion, thermohaline circulation and tides. RESTRICTIONS: Requires permission of instructor.

MAST 801  ENVIRONMENTAL MEASUREMENT TOOLS  1-5
Provides exposure to techniques used in sampling and analysis that develop information used in resource management decision making. The 5-credit taught course has separate components. Students in the Marine Management degree program would take all 5 credits. RESTRICTIONS: Winter Term course for MA degree students in the College of Marine Studies. Students outside the program may take portions of the full course as 1 or 2 credit components.

MAST 802  CASE STUDY IN COASTAL AND OCEAN MANAGEMENT  3
Analyzes issues in coastal and ocean management. Develops interdisciplinary problem-solving strategies. Engages students in real-world marine science/policy problems. Applies disciplinary knowledge, develops synthesis skills. Topics change, but case designs contain multi-disciplinary elements, e.g., physical ocean science, marine biology, oceanography, and marine policy. PREREQ: MAST101 or instructor approval.

MAST 806  GEOPHYSICAL FLUID DYNAMICS I  3
Development of the fundamental fluid dynamics used in analyzing flows in physical oceanography and meteorology. Fundamentals of vorticity dynamics and geostrophy, inviscid theory of Rossby waves, and Ekman boundary layers. PREREQ: MEEG863 and MEEG864.

MAST 808  COASTAL/ESTUARINE PHYSICAL DYNAMICS  3
Coastal and estuarine dynamics covering continental shelf forced circulation; continental shelf waves; modes of estuarine circulation; shelf-estuary interaction; shelf break front dynamics; and estuarine and river plume fronts. PREREQ: MAST602.
MATH 850 Marine Inorganic Chemistry 3
Principles of inorganic chemistry are used to explain and to understand the speciation and reactivity of the elements in the marine environment. Emphasis on the mechanistic aspects of important marine processes including mineral dissolution and formation, electron transfer reactions and the role of metals in biogeochemical reactions. May be cross-listed with CHEM655. PREREQ: MAST646, aquatic chemistry or physical chemistry

MATH 851 Marine Sedimentary Geochemistry 3
Fluxes of major, minor, trace, and nutrient elements and radionuclides from marine waters to sediments deposits with emphasis on deposition rates, sedimentation rate and transport regimes, return fluxes to the overlying waters, and models that may be used to quantify these processes. PREREQ: MAST646 or CIEG632 or PLSC608 or GEO6144.

MATH 852 Isotope Geochemistry 3
Introduction to the field of isotope geochemistry and the application of isotopic systematics to the study of geological, geochemical, hydrological, atmospheric and marine cycles. Light stable isotopes, uranium thorium decay series nuclides, and long-lived heavy isotopes will be considered. PREREQ: MAST646

MATH 853 Oceanography Seminar 1
A review of current oceanographic literature through student presentations. RESTRICTIONS: May be repeated for credit when topics vary.

MATH 855 Coastal and Estuarine Chemistry 3
Distributions, behavior, and chemical processes in estuarine and coastal waters are examined in this advanced general chemical oceanography course. Greater heterogeneity of physical controls and anthropogenic influences give a unique nature to this coastal corridor in the global flux from land to sea. PREREQ: MAST646

MATH 856 Biogeochemical Oceanography 1-4
Modular graduate seminar of individual offerings inspects aspects of marine biogeochemical cycle. Includes such topics as atmospheric and oceanic fluxes, climatic feed back controls involving the ocean, and the role of the marine environment in global change. RESTRICTIONS: May be repeated for credit when topics vary.

MATH 857 Paleoceanography 3
Focuses on processes related to climate change from tectonic to millennial timescales based on the marine sedimentary record of the past 65 million years. Topics include light stable isotopes and biogeochemical cycling of elements. Includes lectures and student-lead discussion of current literature. May be cross-listed with GEO857. RESTRICTIONS: Requires permission of instructor

MATH 868 Research 1-9

MATH 869 Master's Thesis 1-6

MATH 870 Integrated Coastal Management 3
Provides a practical guide to the development, implementation, operation, and evaluation of integrated coastal management (ICM) programs. Examines the evolution of international prescriptions on ICM, and compares and contrasts experiences with integrated coastal management in both developed and developing countries. PREREQ: MAST670.

MATH 871 Environmental Policy and Administration 3
See POSC818 for course description

MATH 873 Seminar: Marine Policy 1
Current topics in marine policy based on recent journal articles and active research and policy relevant activities of students, faculty and visitors from other universities and government agencies. Emphasis on research design and formats for oral and written presentation of results. RESTRICTIONS: May be repeated for credit when topics vary.

MATH 875 Advanced Fishery Economics 3
Theoretical and applied study of the optimal utilization and management of commercial and recreational fisheries with emphasis on equity issues and the difficulty of deriving regulations which are biologically effective and which provide incentives for economic efficiency at reasonable costs. May be cross-listed with ECON875. PREREQ: MAST673 or ECON675

MATH 882 Physical Ocean Science and Engineering Seminar 1
A review of the current literature in physical ocean science and engineering through student presentations

MATH 964 Pre-Candidacy Study 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work. RESTRICTIONS: Not open to students who have been admitted to candidacy

MATH 969 Doctoral Dissertation 1-12 PF

Mathematics

MATH 010 Intermediate Algebra 3 R
Reviews skills necessary for precalculus and college mathematics and statistics. Topics include a review of sets, operations with polynomial and rational expressions, solving equations and inequalities, and an introduction to the coordinate plane and functions. RESTRICTIONS: Requires arithmetic and Algebra I skills

MATH 012 Concepts of Intermediate Algebra 1-3
Reviews skills necessary for pre-calculus and college mathematics and statistics. Topics (when three credits are completed) include a review of sets, operations with polynomial and rational expressions, solving equations and inequalities, and an introduction to the coordinate plane and functions. RESTRICTIONS: Requires arithmetic and Algebra I skills

MATH 113 Contemporary Mathematics 3
Application of scientific methods to investigate phenomena. Solution of various real-world problems using appropriate mathematical methods. Topics include descriptive and inferential statistics, probability, management science, optimization via analysis of models, coding information, social choice and decision making and size and shape. RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH117, MATH127, MATH170 and MATH171 can count toward graduation

MATH 114 College Mathematics and Statistics 3
Stresses mathematical concepts and algebraic skills with a strong emphasis on applications in the areas of management, life and social sciences. Topics include various function classes and models, linear programming and statistics including descriptive and inferential statistics. PREREQ: MATH102 or MATH105.

MATH 115 Pre-Calculus 3
The various classes of functions and their graphs are explored. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for calculus (MATH 221) are emphasized. PREREQ: MATH104 or MATH122.

MATH 117 Pre-Calculus for Scientists and Engineers 4
Designed to prepare students for MATH 241. All topics covered in MATH 115 will be covered as well as additional topics in functions, trigonometry, linear systems, parabolas and sequences. PREREQ: MATH101 or MATH102 or 2 years of high school algebra. RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH117, MATH127, MATH170 and MATH171 can count toward graduation.

MATH 127 Mathematics and Quantitative Reasoning 3
Mathematics driven by typical quantitative reasoning needed in everyday life. Combines critical thinking with basic mathematics in contexts encountered in various areas such as finance, social sciences, politics, the environment, etc. Includes probability and statistics, basic logic, and basic finance. PREREQ: High school algebra

MATH 170 Self-Paced College Mathematics and Statistics 1-3
Stresses mathematical concepts and algebraic skills with an emphasis on applications in the areas of management, life and social sciences. Topics include various function classes and models, linear programming and statistics. Variable credit allows the student to complete the course at a slower pace. PREREQ: MATH101 or MATH102. RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH117, MATH127, MATH170 and MATH171 can count toward graduation.
MATH 171 SELF-PACED PRE-CALCULUS 1-3
Explores the various classes of functions and their graphs. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Emphasizes skills needed for calculus (MATH221). Variable credit option provides an opportunity to change the pace of the course.
PREREQ: MATH010 or MATH012.
RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH117, MATH127, MATH170 and MATH171 can count toward graduation.

MATH 201 INTRODUCTION TO STATISTICAL METHODS I 3
Exploratory analysis, basic probability, discrete and continuous distributions, sampling distributions and confidence intervals, and hypothesis testing on means and proportions. Emphasis on applications in business and economics. Statistical computing is an integral part of this course.
PREREQ: College algebra.

MATH 202 INTRODUCTION TO STATISTICAL METHODS II 3
Two-sample tests on means and proportions, chi-square analysis of contingency tables, complete and randomized block designs, analysis of variance, single linear and multiple regression, model diagnostics, quality control, time series analysis. Emphasis on applications in business and economics. Statistical computing is an integral part of this course.
PREREQ: MATH201.

MATH 205 STATISTICAL METHODS 4
Descriptive statistics, graphical displays, sampling, variation, normal distribution, estimation, hypothesis testing, one-way analysis of variance, simple linear regression and goodness of fit. Laboratory covers use of statistical packages on mainframe and microcomputers.
PREREQ: MATH210 or MATH230.

MATH 210 DISCRETE MATHEMATICS I 3
Sets, logic, induction, number systems, counting, introduction to graph theory, sequences and formal power series.
COREQ: MATH221 or MATH241 or MATH242.

MATH 217 ALGEBRA FOR MIDDLE SCHOOL TEACHERS 3
Examines algebraic concepts developed in the middle grades, including linearity, meanings and uses of variables; and the representation of situations using functions, graphs, and equations.
RESTRICTIONS: Credit is not given for mathematics majors or minors.

MATH 221 CALCULUS I 3
Topics include functions, graphing functions, limits, derivatives, sequences, series, exponential and logarithmic functions, and integration.
PREREQ: MATH217 or MATH241.
RESTRICTIONS: Requires two years of high school algebra and one year of geometry. Credit cannot be received for both MATH217 and MATH241.

MATH 222 CALCULUS II 3
Topics include integration, Taylor polynomials, series, multivariable calculus and trigonometric functions.
PREREQ: MATH221.
RESTRICTIONS: For students in the behavioral, management and social sciences.

MATH 230 FINITE MATHEMATICS WITH APPLICATIONS 3
Set theory, probability, optimization, linear programming and an introduction to matrix methods.
PREREQ: MATH221.
RESTRICTIONS: For students in the behavioral, management and social sciences.

MATH 240 GEOMETRY AND MEASUREMENT FOR MIDDLE SCHOOL TEACHERS 3
Explores geometry and measurement topics and how they are developed throughout the middle school curriculum. Topics include properties of 2D and 3D figures, coordinate geometry, transformations, measurement of length, area and volume, and fundamentals of a deductive system. Includes the use of technology.
RESTRICTIONS: Open only to students pursuing middle school mathematics teaching certification. Grade of C- or higher in MATH253 or permission of instructor.

MATH 241 ANALYTIC GEOMETRY AND CALCULUS A 4
Functions, limits, continuity, derivatives and definite integrals. Credit cannot be received for both MATH241 and MATH221.

MATH 242 ANALYTIC GEOMETRY AND CALCULUS B 4
Exponential and log functions; inverse trig functions; integration techniques; parametric curves; polar coordinates; infinite series. Includes use of the computer package, Maple, to perform symbolic, numerical and graphical analysis.
PREREQ: MATH241.
RESTRICTIONS: Credit cannot be received for both MATH242 and MATH222.

MATH 243 ANALYTIC GEOMETRY AND CALCULUS C 4
Vectors, operations on vectors, velocity and acceleration, partial derivatives, directional derivatives, optimization of functions of two or more variables, integration over two and three dimensional regions, line integrals, Green’s Theorem. Includes use of the computer package, Maple, to perform symbolic, numerical and graphical analysis.
PREREQ: MATH242.

MATH 245 AN INTRODUCTION TO PROOF 3
Basic set operations, relations, equivalence relations, functions, inverse functions, cardinality, order properties of real numbers, least upper bound, greatest lower bound, completeness axiom, topology of reals, complex numbers.
PREREQ: MATH210 and MATH243.

MATH 251 MATHEMATICS FOR K-8 TEACHERS: NUMBER AND OPERATIONS 3
Explores concept development in number systems, base ten system, the meaning of the four operations, number theory, and integers. Emphasis on problem solving and general number sense.
RESTRICTIONS: Successfully pass the School of Education Competency Test.

MATH 252 MATHEMATICS FOR K-8 TEACHERS: RATIONAL NUMBERS AND PROBABILITY 3
Explores concept development in rational numbers, operations with rational numbers, proportional reasoning, and probability.
PREREQ: MATH251.
RESTRICTIONS: Grade of C- or higher in MATH251.

MATH 253 MATHEMATICS FOR K-8 TEACHERS: GEOMETRY, ALGEBRA AND MEASUREMENT 3
Explores concept development in figures, the role of definitions, coordinate geometry, transformations, functions and measurements of length, area and volume.
PREREQ: MATH252.
RESTRICTIONS: Grade of C- or higher in MATH252.

MATH 268 PERSPECTIVES ON MATHEMATICS 1
Designed for mathematics and other majors to expand students’ understanding of contemporary mathematical thought, practice, culture and tools. Features presentations from faculty and invites on mathematical endeavors and professional activities in an informal atmosphere.
PREREQ: MATH241 or equivalent.

MATH 279 PROBLEM SOLVING STRATEGIES I 1
Designed to study a multitude of problem-solving strategies such as working backwards, looking for a pattern, etc. Emphasizes the use of these strategies with the content that secondary mathematics teachers normally teach.
PREREQ: MATH241.

MATH 300 STATISTICAL METHODS AND THEORY 4
Exploratory data analysis, probability, estimation, classical statistical inference, regression, multiple regression. Laboratory covers use of statistical packages.
PREREQ: MATH210 and MATH243.

MATH 302 ORDINARY DIFFERENTIAL EQUATIONS 3
Solutions and applications of ordinary differential equations as well as systems. Considers initial value problems and boundary value problems. Topics include Laplace transform, the phase plane, series solutions and partial differential equations. Includes use of the computer package Maple.
COREQ: MATH243.
RESTRICTIONS: Credit not given for both MATH302 and either MATH341, MATH342, MATH351 or MATH352.

MATH 303 DIFFERENTIAL EQUATIONS COMPUTING LAB 1
Provides computing experience in differential equations.
COREQ: MATH302.

MATH 305 APPLIED MATHEMATICS FOR CHEMICAL ENGINEERING 3
A special applied mathematics course designed for chemical engineering majors. Emphasis is given on the interaction between mathematical theory and its engineering applications. May be cross-listed with CHEG305.
PREREQ: A minimum grade of C- in MATH243 and CHEG112.
RESTRICTIONS: For chemical engineering majors only.

MATH 308 HISTORICAL DEVELOPMENT OF MATHEMATICAL CONCEPTS AND IDEAS 3
Examines the origins of ideas, processes and topics in the history of mathematics. Biographical sketches of the creators, descriptions of their diverse cultures and a writing project are included.
PREREQ: MATH241.
RESTRICTIONS: Credits cannot be used to satisfy major or minor requirements in mathematics other than the secondary mathematics education program.
MATH 315 DISCRETE MATHEMATICS II 3
Algorithmic graph theory and computational geometry. Topics in graph theory cover shortest path problems, coloring problems, and others. The computational geometry covers Steiner tree, convex hull, design of experiments and selected topics.
PREREQ: MATH210.

MATH 341 DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA I 3
Topics include first and second order differential equations, systems of algebraic equations, determinants, vector spaces, eigenvalues and eigenvectors of matrices, and systems of differential equations. Emphasis on the interaction between these topics and appropriate physical systems.
PREREQ: MATH242
RESTRICTIONS: Credit not given for both MATH341 and either MATH302, MATH349 or MATH351. Open to majors outside mathematics.

MATH 342 DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA II 3
A continuation of MATH341. Topics include series solutions, Laplace transform methods, boundary value problems, orthogonality, higher order equations, difference equations and numerical techniques. Continued emphasis on the interaction between these topics and physical systems.
PREREQ: MATH341
RESTRICTIONS: Credit not given for both MATH342 and either MATH302, MATH349 or MATH352. Open to majors outside mathematics.

MATH 349 ELEMENTARY LINEAR ALGEBRA 3
PREREQ: MATH230 or MATH242
RESTRICTIONS: Credit not given for both MATH349 and either MATH341, MATH342 or MATH351.

MATH 350 PROBABILITY THEORY AND SIMULATION METHODS 3
Introduces the basic theory in both discrete and continuous aspects of probability theory.
PREREQ: MATH210 or MATH230
COREQ: MATH243.

MATH 351 ENGINEERING MATHEMATICS I 3
Solutions of linear algebraic equations, Gauss elimination, vector spaces, subspaces, linear dependence, linear ordinary differential equations of 2nd order and higher, initial value and boundary value problems, eigenvalues, coupled linear ordinary differential equations, nonlinear differential equations, with engineering applications.
COREQ: MATH243
RESTRICTIONS: Credit not given for both MATH351 and either MATH302, MATH349 or MATH341. Open to MEEG and CIEG students only.

MATH 352 ENGINEERING MATHEMATICS II 3
Laplace transform, application to constant coefficient ordinary differential equations, scalar and vector fields, Laplace, line integrals, divergence theorem, Stokes theorem, Fourier series, orthogonality, diffusion equation, Laplace's equation, wave equation, separation of variables, with engineering applications.
PREREQ: MATH351
RESTRICTIONS: Open to MEEG and CIEG majors only.

MATH 353 ENGINEERING MATHEMATICS III 3
PREREQ: MATH351
RESTRICTIONS: Open to MEEG and CIEG majors only.

MATH 366 INDEPENDENT STUDY 1–6

MATH 379 PROBLEM SOLVING STRATEGIES 1
Studies a multitude of problem solving strategies such as looking for a pattern, making a model, working backwards, etc.
COREQ: MATH366.

MATH 380 APPROACHES TO TEACHING MATH 3
Aims, course planning, instructional strategies, evaluation and selection of materials for teaching mathematics in secondary schools.
COREQ: MATH379
RESTRICTIONS: Requires permission of the Committee on Secondary School Mathematics. Not for major (B.A. or B.S.) or minor credit in mathematical sciences.

MATH 382 STUDENT TEACHING SEMINAR IN SECONDARY MATH 2 PF
Provides student teachers opportunities to reflect upon and discuss classroom teaching experience. Focuses on classroom management and other professional issues.
PREREQ: MATH380
COREQ: EDUC400.

MATH 401 INTRODUCTION TO REAL ANALYSIS 3
A rigorous treatment of one variable calculus. Topics will include sequences of real numbers, limit theorems, monotone sequences, Cauchy sequences, Bolzano-Weierstrass Theorem, continuity, uniform continuity, differentiability and Riemann integral. A historical perspective on the development of these topics will be provided.
PREREQ: MATH245.

MATH 426 INTRODUCTION TO NUMERICAL ANALYSIS AND ALGORITHMIC COMPUTATION 3
Direct and iterative methods for solution of algebraic equations and systems of linear equations, matrix inversion, pseudo-inverses, algebraic eigenvalue problems, linear least squares problems and nonlinear equations. Stresses both numerical analysis and asymptotic aspects.
May be cross-listed with CISC410
PREREQ: MATH349 or MATH341 or MATH351; and CISC105 or CISC181
RESTRICTIONS: Requires familiarity with computer languages (e.g., programming language).

MATH 428 ALGORITHMIC AND NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS 3
Algorithms for numerical integration and differentiation. Initial value problems, boundary value problems in ordinary differential equations; finite difference (explicit and implicit) methods; polynomial and spline approximation; finite elements and collocation; and introduction to numerical methods for partial differential equations. May be cross-listed with CISC411
PREREQ: MATH426 or CISC410.

MATH 450 MATHEMATICAL STATISTICS 3
Introduction to mathematical aspects of statistics. Topics include exploratory data analysis, parameter estimation, maximum likelihood method, testing of hypotheses, confidence intervals and others. Includes application of a computer software package to perform data analysis.
PREREQ: MATH350 or an equivalent course in probability.

MATH 451 ABSTRACT ALGEBRA I 3
Basic properties of the integers and the rationals, fields of quotients, polynomial rings, group theory, introduction to groups, rings and fields. A historical perspective on the development of the notion of number and algebraic structure will be provided.
PREREQ: MATH349 and MATH245.

MATH 466 INDEPENDENT STUDY 1–6

MATH 503 ADVANCED CALCULUS FOR APPLICATIONS 3
Change of variables, surface integrals, Stokes theorem, Divergence Theorem, calculus of variations, Euler's equation, brachistochrone, isoperimetric problem, Fourier series, pointwise and mean square convergence, vibrating string, Fourier transform, inversion formula, heat equation on a half line.
PREREQ: A 500 or higher level course on differential equations.

MATH 508 INTRODUCTION TO COMPLEX VARIABLES AND APPLICATIONS 3
Introduction to analytic functions, contour integration, power series, residues and conformal mapping.
PREREQ: MATH243.

MATH 512 CONTEMPORARY APPLICATIONS OF MATHEMATICS 3
Designed to provide hands-on learning experience in contemporary applications of mathematics. Involves work with investigators from industry, national laboratories and other departments. Mathematical topics may include ordinary and partial differential equations, systems of differential equations, transform, asymptotic and numerical methods.
PREREQ: A 300 or higher level course on differential equations.

MATH 518 MATHEMATICAL MODELS AND APPLICATIONS 3
Illustration and analysis of mathematical models for problems in the biological, physical and social sciences.
PREREQ: Either MATH230 or MATH349, and MATH300 or STAT370.

MATH 529 LINEAR PROGRAMMING: METHODS AND APPLICATIONS 3
Theory of linear programming (linear inequalities, convex polyhedra, duality), related topics (games, integer programming), main algorithms (simplex, dual) and representative applications in agriculture, economics, engineering, operations research and mathematics. Familiarity with computer implementation of LP methods acquired by individual (or small group) projects of applying LP to the students' chosen areas.
PREREQ: MATH349.
MATH 530 Optimization and Game Theory  3
Convex functions and sets, duality, fixed point theorems, elementary game theory and
the theory of Nash and Varafson equilibria; non-linear programming and
the Kuhn-Tucker Theorem; dynamic optimization including dynamic programming and
Pontryagin's Maximum Principle. Emphasis on applications and interpretation in
terms of economic models.
May be cross-listed with ECON530
PREREQ: MATH 302, MATH 349, ECON 301 and ECON 303
MATH 535 Introduction to Partial Differential Equations  3
Theory and applications of parabolic, elliptic and hyperbolic partial differential
equations originating from various mathematical, physics problems
PREREQ: MATH302 or MATH342 or MATH352
MATH 540 College Geometry: A Historical Approach  3
Historical development of the axiomatic systems in geometry, inauguration of
deductive reasoning introduced by the Greeks (Euclid) along with the axiomatic
developments, extensions, algebraic methods and geometric properties which
followed. Plane, analytic, transformational and projective geometries are included.
PREREQ: MATH145
RESTRICTIONS: Graduate credit only for teachers
MATH 549 Coding Theory and Cryptography  3
Basic coding theory including correcting and detecting error patterns. Cryptography,
including symmetric key encryption, DES, RSA and cryptographic protocols.
PREREQ: MATH349
MATH 581 On the Nature of Proof  3
Designed for secondary teachers to show how to investigate a problem, develop
ideas, test conjectures and, if appropriate, prove that resulting statements are
correct. Problems, including proofs, are chosen from the areas of algebra, pre
-calculus, geometry and number theory.
PREREQ: BA/BS Math or Math Ed
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education
MATH 582 Studies in Discrete Mathematics  3
Designed to show secondary teachers how discrete mathematics underlies the
science and technology specific to the computer age. Using the NCTM Standards as
a guide, topics include relations, combinatorics, graph theory, sequences, and
linear programming, as well as associated algorithms
PREREQ: MATH581
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education
MATH 583 Probability and Statistics for Education  3
Designed specifically for middle and secondary teachers. Topics emphasized
include graphical methods, probability models, statistical inference and study
design. Offers an orientation to popular software packages. Applications selected from
current literature.
PREREQ: Undergraduate statistics course
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education
MATH 584 Advanced Secondary Mathematics Methods  3
Designed to develop perspectives, knowledge and frameworks which an
inservice teacher can use to organize, interpret and critique their own teaching
experience and that of others.
RESTRICTIONS: Requires permission of instructor. Credit to be used only in
graduate programs in mathematics education
MATH 585 Technology in Secondary Mathematics  3
Major emphasis on learning how to use computer software to enhance both the
teaching and learning of algebra, geometry, statistics, probability and
precalculus. Participants get hands-on experience with a function plotter,
spreadsheet, geometry package and a statistic/probability package.
RESTRICTIONS: Working knowledge of graphing calculators. Credit to be used only in
graduate programs in mathematics education
MATH 586 Mathematical Problem Solving: Theories and Practices  3
Designed to offer secondary teachers an opportunity to face and solve nonroutine
problems. Teachers will become familiar with problem solving strategies that can
be used not only with nonroutine problems but also with standard problems in an
existing mathematics curriculum.
RESTRICTIONS: Requires permission of instructor. Credit to be used only in
graduate programs in mathematics education
MATH 587 Proportional Reasoning  3
Introduces and reinforces the underlying concepts of proportional reasoning and
their applications in science and social science.
RESTRICTIONS: Restricted to middle school mathematics and science teachers
MATH 588 Geometry and Measurement for Middle School Teachers  3
Properties of 2-D and 3-D figures; measurement of length, area and volume;
spatial relationships; transformations; connections with coordinate geometry;
foundational concepts of deductive system; van Hiele model of development of geometric
reasoning and, use of Geometer's Sketchpad software to enhance package to
enhance both teaching and learning of geometry and measurement.
May be cross-listed with EDUC588
MATH 600 Fundamentals of Real Analysis I  3
Rigorous introduction to classical real analysis. Brief review of real numbers and a
thorough discussion of the basic topology of metric spaces. Covers in detail the following
topics: the analysis of sequences and series; continuity; differentiation and
Taylor's theorem; and the analysis of sequences and series of functions.
PREREQ: MATH401
MATH 602 Fundamentals of Real Analysis II  3
Riemann integration, an introduction to Lebesque integration, multivariable calculus
PREREQ: MATH600
MATH 611 Introduction to Numerical Analysis and Scientific Computing  3
Introduction to numerical computing, analysis and solution of systems of linear
equations, linear least-squares, eigenvalue problems, methods for unconstrained
optimization, solution of systems of nonlinear equations. Experience with standard
computer packages, code development and simulations of applied problems.
PREREQ: MATH503 or MEEG563 or PHYS207
MATH 612 Introduction to Numerical Analysis and Partial Differential Equations  3
Basic finite difference schemes for standard model problems. Schemes for
solving dependent problems (including ordinary differential equations) Curved
boundaries. Dispersion and Von Neumann analysis. Lax equivalence theorem and the CFL
condition.
PREREQ: MATH503 or MEEG563 or PHYS207
MATH 613 Applied Symbolic Computation  3
See CISC623 for course description.
MATH 616 Introduction to Applied Mathematics I  3
Introduction to ideas and techniques used in solving problems arising in a variety
of physical settings. Stability of nonlinear systems of ODE's; Sturm-Liouville
problems and Green's functions. The wave, heat and Laplace equations.
Elementary analysis of some nonlinear PDE's. Special functions, asymptotic
expansions and perturbation theory.
PREREQ: One semester of advanced calculus
MATH 617 Introduction to Applied Mathematics II  3
Continuation of MATH616
PREREQ: MATH616
MATH 630 Probability Theory and Applications  3
Introduction to probability theory as background for further work in statistics or
stochastic processes. Sample spaces and axioms of probability; discrete sample
spaces having equally likely events; conditional probability and independence;
random variables and describing their distributions; classical discrete and
continuous random variables; mathematical expectation and moments of a
distribution; the distribution of a function of a random variable; Chebyshev's
inequality; the law of large numbers; central limit theorem
MATH 631 Introduction to Stochastic Processes  3
Classical stochastic processes with emphasis on their properties which do not
involve measure theory. Markov chains in discrete and in continuous time with
examples from random walk, birth and death processes, branching processes and
queuing theory. Renewal and Markov renewal processes. Basic notions of
Brownian motion and second-order processes.
PREREQ: MATH630
MATH 650 Abstract Algebra  3
Elementary number theory, polynomial and abstract rings, ideals and quotient
rings, Pid's and Euclidean rings, groups, cyclic and Abelian groups, direct
products, algebraic field extensions, splitting fields, field automorphisms, finite
fields.
PREREQ: Undergraduate abstract algebra
MATH 672 Vector Spaces  3
Vector spaces, linear transformations, decomposition theorems and bilinear forms
PREREQ: MATH349
MATH 688 Combinatorics and Graph Theory I  3
Combinatorial enumeration, designs and geometries, graphs, set systems,
partially ordered sets, existence and construction of various combinatorial objects,
Ramsey theory.
PREREQ: MATH650 or consent of instructor
MATH 689  COMBINATORICS AND GRAPH THEORY II  3
Methods of linear algebra in combinatorics and graph theory, basics of coding
theory and associated designs, number theory and cryptography, communication
complexity.
PREREQ: Knowledge of linear algebra

MATH 694  METHODS OF OPTIMIZATION  3
Review of linear programming, unconstrained and constrained non-linear programs,
numerical methods, Kuhn-Tucker theory, duality and Lagrange multipliers

MATH 805  REAL ANALYSIS  3
Lebesgue measure and integration, differentiation and absolute continuity, Lp
spaces, distributions and Sobolev spaces
PREREQ: MATH602

MATH 806  FUNCTIONAL ANALYSIS  3
Fundamental results for normed linear spaces with special emphasis on the theory
of Hilbert space, spectral theorems and application to integral and differential
equations.
PREREQ: MATH602.

MATH 807  COMPLEX ANALYSIS  3
Complex numbers, analytic functions, geometry of elementary functions; integrals;
power series; residues and poles.
PREREQ: MATH602.

MATH 810  ASYMPTOTIC AND PERTURBATION METHODS  3
Asymptotic expansions of real and complex integrals; singular perturbation theory
for ODEs and PDEs, WKB and multiple-scale expansion techniques. Selected
applications.
PREREQ: MATH617 and knowledge of analytic function theory or consent of
instructor

MATH 812  INVERSE PROBLEMS  3
Ill-posed problems, regularization methods, Tikhonov regularization, the
discrepancy principle, regularization by discretization. Selected topics from
nonlinear inverse problems.
PREREQ: MATH617 and MATH806.

MATH 821  TOPICS IN APPLIED ANALYSIS  3
Topics chosen from ordinary differential equations, harmonic analysis,
optimization theory and integral equations
RESTRICTIONS: Requires permission of instructor

MATH 824  TOPICS IN APPLIED MATHEMATICS  3
Topics chosen from numerical analysis, elasticity, electromagnetic theory, fluid
dynamics and other areas
RESTRICTIONS: Requires permission of instructor

MATH 826  TOPICS IN PURE MATHEMATICS  3
Topics vary from year to year and will be chosen from a variety of areas in pure
mathematics
RESTRICTIONS: Requires permission of instructor.

MATH 827  TOPOLOGY  3
Generation and properties of topological spaces including connectedness and
compactness. Continuity, separation and countability properties; convergence of
nets and filters

MATH 835  PARTIAL DIFFERENTIAL EQUATIONS I  3
Methods of analysis and solution for partial differential equations, both initial and
boundary value problems. Brings mathematical techniques to vital and current
systems of equations arising in many fields. Topics include elliptic, hyperbolic and
parabolic systems from a classical and variational perspective
PREREQ: MATH617.

MATH 836  PARTIAL DIFFERENTIAL EQUATIONS II  3
Cauchy's problem and initial boundary value problems for hyperbolic and
parabolic equations and systems. Boundary value problems for elliptic equations
and systems. Sobolev space and semigroup methods will be emphasized
PREREQ: MATH806 and a course on partial differential equations

MATH 838  NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS  3
Introduces concepts of consistency, stability and convergence of numerical
schemes. Finite element and finite difference schemes and their applications to
fundamental partial differential equations will be emphasized.
PREREQ: MATH812 or equivalent

MATH 845  GROUPS AND THEIR APPLICATIONS  3
Review of elementary group theory, permutation groups, group actions, Sylow
theorems, semi-direct and wreath products, classical matrix groups, automorphism
groups of combinatorial structures, Polya enumeration. May also include
representation theory, free groups, finite groups of isometries of Euclidean spaces.
PREREQ: MATH650 or consent of instructor.

MATH 850  THEORY OF PROBABILITY  3
Mathematically rigorous treatment of probability theory with emphasis on methods
and tools for applications. Axioms of probability and independence. An
introduction to large deviation theory and Martingale theory. Probabilistic
methods in combinatorics and analysis
PREREQ: MATH402 or consent of instructor

MATH 851  RESEARCH  1-6

MATH 859  MASTER'S THESIS  1-6

MATH 870  READING IN MATHEMATICS  1-6

MATH 884  FINITE GEOMETRIES AND DESIGNS  3
Classical projective and affine spaces, nonsesquilinear quasians, coordinate
systems, spreads and packings, codes and unital, collineation groups and Singer
cycles. Further topics chosen from related geometrical designs, associated codes
and algebraic surfaces/varieties
PREREQ: MATH688 and MATH845

MATH 885  EXTREMAL COMBINATORICS  3
Topics from extremal graph theory, extremal set theory and combinatorial
geometry. Methods used will be algebraic, geometric and probabilistic.
PREREQ: MATH688 and MATH699

MATH 964  PRE-CANDIDACY STUDY  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying
examinations for doctoral students before admission to candidacy but after
completion of all required coursework
RESTRICTIONS: Not open to students who have been admitted to candidacy

MATH 969  DOCTORAL DISSERTATION  1-12 PF

MEDICAL TECHNOLOGY

MEDT 100  INTRODUCTION TO MEDICAL TECHNOLOGY  1
Orientation to the profession of medical technology with overview of clinical
laboratory science areas. Discussion of the laboratory's critical role in healthcare
delivery and the diversity of employment and career opportunities

MEDT 210  INFORMATION TECHNOLOGIES AND COMMUNICATION SKILLS  2
Focuses on the use of computer and education technology such as Powerpoint,
Word, Excel, WWW browsers and email as tools to achieve effective
communication necessary for success in the biomedical sciences.
RESTRICTIONS: Open to sophomores, juniors and seniors Requires permission of
instructor

MEDT 366  INDEPENDENT STUDY  1-6

MEDT 370  PHLEBOTOMY PRACTICUM  1
Introduction to the theory and performance of phlebotomy. Supervised clinical
experience in the application of laboratory theory and techniques in phlebotomy.
RESTRICTIONS: Open to medical technology majors only

MEDT 372  DIAGNOSTIC PARASITOLOGY  2
Study of human parasites, emphasizing detection and identification of diagnostic
forms. RESTRICTIONS: Open to medical technology majors only

MEDT 375  CLINICAL LABORATORY PRINCIPLES AND STATISTICS  2
Basic laboratory principles including solution preparation, mathematics, safety,
quality assurance and spectrophotometry. Introductory statistics including
applications to laboratory information systems and research
RESTRICTIONS: Requires permission of instructor

MEDT 380  CLINICAL IMMUNOLOGY AND MEDICAL VIROLOGY  4
Introductory immunology concepts and the use of immunological assays, such as
complement fixation, enzyme immunocassays, and fluorescent antibody assays, for
the diagnosis of infectious diseases and immunological disorders. Study of
viruses, diseases they cause, and the methods used to diagnose viral infections.
PREREQ: BISC208, BISC300, and CHEM213 or CHEM321
RESTRICTIONS: Requires permission of instructor

MEDT 390  INTRODUCTION TO MOLECULAR DIAGNOSTICS  2
Introduction to molecular biology principles and techniques used in the clinical
laboratory for diagnosis, prognosis and treatment of disease. Topics include
isolation of DNA, RNA, and proteins from biological fluids, electrophoresis, PCR,
 viral nucleic acid testing and DNA sequencing.
PREREQ: BISC208, and CHEM311 or CHEM321
RESTRICTIONS: Requires permission of instructor
MEDT 420 IMMUNOHEMATOLOGY II Laboratory 1
Laboratory procedures consistent with MEDT420.
COREQ: MEDT420

MEDT 430 DIAGNOSTIC MICROBIOLOGY AND MEDICAL MYCOLOGY 2
Diagnostic bacteriology, emphasizing the correlation of in vitro and in vivo
findings in the diagnosis and treatment of infectious disease, including human
mycoses. Identification of pathogenic and nonpathogenic bacteria and fungi in
clinical specimens.
PREREQ: MEDT406 and MEDT416
COREQ: MEDT431

MEDT 431 DIAGNOSTIC MICROBIOLOGY AND MEDICAL MYCOLOGY LABORATORY 2
Study and implementation of laboratory procedures that correlate with the
material taught in MEDT406 and MEDT416.
COREQ: MEDT431

MEDT 450 ANATOMY OF PROFESSIONALISM 1–3
Introduces medical technology majors and those already in the clinical laboratory
field to aspects of professional development essential for success in the modern
healthcare arena and for lifelong learning. Includes a first-hand experience at a
national clinical laboratory science annual meeting, accompanied by on-site
discussions and student presentations on campus.
RESTRICTIONS: Restricted to MT/MTI majors and MT graduates.

MEDT 461 LABORATORY PRACTICE AND LEADERSHIP I 1
Introduction to clinical laboratory practice and leadership with emphasis on
management styles, motivational techniques, communication skills, organizational
leadership, and administration of personnel.
RESTRICTIONS: Requires permission of instructor.

MEDT 466 INDEPENDENT STUDY 1–6
Clinical experience in the application of laboratory theory and techniques in
medicolegal situations.
PREREQ: MEDT400.

MEDT 471 LABORATORY PRACTICE AND LEADERSHIP II 1
Continued discussion of clinical laboratory practice and leadership. Emphasis on
responsibilities relating to daily operation of the laboratory, including human
resource management, financial planning, cost analysis, laboratory design,
laboratory information systems, marketing, government regulations and
accreditation.
PREREQ: MEDT461
RESTRICTIONS: Requires permission of instructor.

MEDT 472 CLINICAL URINALYSIS PRACTICUM 1 PF
Clinical experience in the application of laboratory theory and techniques in
clinical urinalysis.
PREREQ: MEDT400.

MEDT 473 CLINICAL CHEMISTRY PRACTICUM 3 PF
Supervised experience in the application of laboratory procedures in
clinical chemistry.
PREREQ: MEDT403 and MEDT413.

MEDT 475 CLINICAL HEMATOLOGY PRACTICUM 3 PF
Supervised experience in the application of laboratory procedures in hematology.
PREREQ: MEDT405 and MEDT415.

MEDT 477 CLINICAL MICROBIOLOGY PRACTICUM 3 PF
Supervised experience in the application of laboratory procedures in diagnostic
microbiology.
PREREQ: MEDT430 and MEDT431.

MEDT 479 CLINICAL IMMUNOHEMATOLOGY PRACTICUM 3 PF
Supervised experience in the application of laboratory procedures in
immunohematology.
PREREQ: MEDT420 and MEDT421.

MECHANICAL ENGINEERING

MEEG 101 INTRODUCTION TO MECHANICAL ENGINEERING 3
Introduces the mechanical engineering profession. Uses a team design project to
illustrate the engineering design process. Introduces computational tools.

MEEG 102 INTRODUCTION TO MECHANICAL ENGINEERING LABORATORIES 1
Introduces laboratory techniques and procedures focusing on data acquisition and
reporting; also introduces mechanical engineering disciplines.

MEEG 112 STATICS 3
To recognize, idealize and solve problems involving rigid bodies in static
equilibrium using scalar and vector techniques. Introduces free body diagrams,
friction, center of gravity, moment of inertia. Emphasizes the role of statics in the
design process.
COREQ: MATH242 and PHYS207.
MEEG 202  COMPUTER-AIDED ENGINEERING DESIGN
Introduces computer-aided mechanical engineering by developing the student's ability to 1) think visually; 2) communicate spatial information to an engineer audience through parametric solid modeling drafting standards and 3) begin to recognize the connection between a virtual design and an actual component.
PREREQ: MEEG101.

MEEG 211  DYNAMICS
Intermediate-level development of the kinematics and dynamics of particle systems and rigid bodies. Solution of engineering problems by force, momentum and energy methods with applications to mechanisms, machines, and vehicles. Computer problems
PREREQ: MEEG112 and PHYS207.

MEEG 215  MECHANICS OF SOLIDS
Analytical study of stresses and deformations and their application to the design of machine and structural elements under axial, torsional, bending and lateral loads. Buckling and energy methods will also be discussed
PREREQ: MEEG112.

MEEG 301  MACHINE DESIGN-KINEMATICS & KINETICS
Kinematic analysis of mechanisms and machines, kinematic synthesis, cam design, gear train analysis and machine dynamics
PREREQ: MEEG211.

MEEG 304  MACHINE DESIGN-ELEMENTS
Aspects of machine design: statistical nature, theories of failure and design for strength and design of machine elements.
PREREQ: MEEG215, MEEG301, and MEEG321.
RESTRICTIONS: Open to majors only

MEEG 311  VIBRATION AND CONTROL
PREREQ: MEEG211.

MEEG 321  MATERIALS ENGINEERING
Mechanical properties and materials behavior under static and dynamic loading; fatigue, creep, wear and corrosion; properties and applications of metals, ceramics, polymers and composites; forming and joining of materials; practical examples of materials selection in design and the use of materials data bases
PREREQ: MEEG215 and MSEG302.

MEEG 331  FLUID MECHANICS I
Incompressible fluid mechanics: fluid statics, control volume analysis for mass, momentum and energy; differential analysis of viscous and inviscid flow; dimensional analysis; experiments in fluid mechanics.
PREREQ: MEEG112 and MATH351.
RESTRICTIONS: Open to majors only

MEEG 332  FLUID MECHANICS II
Compressible flows, isentropic flow, shock waves; lift and drag; inviscid flows, potential and stream functions, elementary wing theory; boundary layers; computational fluid dynamics.
PREREQ: MEEG331.

MEEG 342  HEAT TRANSFER
PREREQ: PHYS310.

MEEG 344  THERMODYNAMICS
Properties of non-ideal gases. Properties of mixtures as applied to humidity and chemical equilibrium. Analysis and computer-aided optimization of air conditioning and combustion systems
PREREQ: PHYS310.

MEEG 346  THERMAL LAB
Introduction to experimental and measurement techniques related to thermodynamics and heat transfer. Designed to complement MEEG342 and MEEG344.
PREREQ: PHYS310.
COREQ: MEEG342 and MEEG344.

MEEG 361  APPLIED ENGINEERING ANALYSIS
Linear algebra; vector field theory; Fourier series and partial differential equations. Engineering applications
PREREQ: MATH302.

MEEG 366  INDEPENDENT STUDY 1-6

MEEG 401  SENIOR DESIGN
Capstone engineering practice where teams develop real engineering system designs; discover outside requirements; benchmark best practices; develop engineering specifications; generate concepts; and justify a specific concept. Design, fabricate, assemble, test and improve an actual prototype.
PREREQ: MEEG304.
RESTRICTIONS: For majors only

MEEG 411  STRUCTURAL MECHANICS FOR MECHANICAL AND AEROSPACE ENGINEERING
Introduction to theory of plates and shells, including analysis of stresses and deformations, vibrations, stability and thermal response of structures typical of modern aerospace and undersea vehicles, pressure vessels and other continuous structures
PREREQ: MEEG211 and MEEG215.

MEEG 415  FINITE ELEMENT ANALYSIS
Introduction to the finite element method with applications to structural engineering problems. Direct and variational approaches to element formulation; interpolation functions and isoparametric elements
PREREQ: MEEG215.

MEEG 423  VIBRATIONS
Introduction to mechanical vibrations and structural dynamics. Analysis and synthesis by matrix and energy methods. Applications to machine design, vehicle dynamics and shock and vibration isolation
PREREQ: MEEG211.

MEEG 424  VEHICLE DYNAMICS
Theory of the dynamics of ground vehicles. Topics include tire adhesion, slip angle, suspension analysis and design, chassis design and aerodynamics with downforce generation
PREREQ: MEEG112 and MEEG211. MEEG311 is recommended

MEEG 425  AUTOMOTIVE POWERTRAIN THEORY
Analysis and design of automotive powertrain design with emphasis on competition and efficiency optimization
PREREQ: MEEG301, PHYS310.

MEEG 432  AERODYNAMICS
PREREQ: MEEG332 and MEEG342.

MEEG 433  BIOENGINEERING FLUIDS AND TRANSPORT
Anatomy and physiology of pulmonary, cardiac, genitourinary, cerebrospinal and synovial systems. Application of fluid, heat and mass transport fundamentals to analysis of these biological systems.
PREREQ: MEEG332 and MEEG342.

MEEG 434  AIR POLLUTION PROCESSES
Physical, chemical, and meteorological processes that govern the photochemistry and transport of gas-phase and aerosol-phase air pollutants in the atmosphere. Topics to be covered include air quality, pollutant emissions, gas-phase and liquid-phase chemistry, aerosol dynamics, plumes, turbulent transport in geophysical flows, meteorology, and deposition.
RESTRICTIONS: Requires upper division status in engineering.

MEEG 441  COMBUSTION
Fundamentals and application of combustion. Topics include thermodynamics, chemical kinetics, explosives and oxidative characteristics of fuels; combustion-generated pollutants; ignition and flammability phenomena; detonation; laminar in premixed flames; gaseous diffusion flames; and droplet combustion
PREREQ: MEEG344.

MEEG 442  INTRODUCTION TO FUEL CELLS
Basic principles of fuel cells, fuel cell types and their applications, fuel processing and hydrogen storage
PREREQ: MEEG331, MEEG342, MEEG344, or equivalent.

MEEG 445  SENIOR RESEARCH I
Investigation of an experimental nature to be carried out and reported upon by each student. RESTRICTIONS: Open to seniors only

MEEG 446  SENIOR RESEARCH II
Investigation of an experimental nature to be carried out and reported upon by each student. RESTRICTIONS: Open to seniors only
MEEG 435 MANUFACTURING PROCESSES AND SYSTEMS
Explains key concepts and elements of basic processes (metal cutting, forming, plastic molding, more), technologies (robotics, ergonomics, material handling, quality management, machine vision, more), industries/systems (pharmaceutical, automotive, packaging, food, more) and current advancements (lean mfg., just-in-time, more).
PREREQ: MEEG321 or consent of instructor.

MEEG 466 INDEPENDENT STUDY
1–6

MEEG 481 COMPUTER SOLUTION OF ENGINEERING PROBLEMS
Overview of numerical modeling in continuum mechanics. Case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities, and limitations of commercial codes.

MEEG 482 CLINICAL BIOMECHANICS
The biomechanics and patho-mechanics of various human musculoskeletal joint systems. Normal joint anatomy and biomechanics, the mechanical effects of pathology and the goals of surgical repairs to counteract them will be explored through in vivo and mathematical modeling studies of joint system mechanics.

MEEG 483 ORTHOPEDIC BIOMECHANICS
Anatomy and physiology including microanatomy and mechanics of bone, cartilage, tendon and muscle. Mechanical modeling of body including joint loads, motion analysis, muscle forces, and interaction with orthopedic devices.
PREREQ: MEEG211 and MEEG215.

MEEG 484 BIOMATERIALS AND TISSUE ENGINEERING
Biomaterials for mechanical replacement of Orthopaedic tissues: bone, cartilage, ligament, tendon, and whole joint systems. Topics include normal tissue mechanics and biomechanical compatibility, mechanical behavior, degradation, and host response to biomaterials. Experimental methods to assess biomaterials along with design and manufacturing considerations for joint and tissue replacements.

MEEG 600 SEMINAR
1 PF

MEEG 610 INTERMEDIATE SOLID MECHANICS
Indicial notation, tensors; displacement, strain, compatibility; traction and stress, equations of motion; constitutive description of an elastic material; solutions to boundary value problems including torsion, bending, plane problems in elasticity (Airy stress function) and elements of linear elastic fracture mechanics.

MEEG 611 SANDWICH STRUCTURES
Composite and isotropic sandwich structures are studied for stresses, deformations, buckling loads, natural frequencies and dynamic response under mechanical and environmental loads, involving honeycomb, solid, foam, web and trusscore sandwich comprising beam, plate, ring and shell structures. Design and minimum weight optimization are treated.

MEEG 612 BIOMECHANICS OF HUMAN MOVEMENT
Mechanics of the musculoskeletal system with an emphasis on the control of human movement. Topics include how the nervous system activates muscles, the mechanical properties of skeletal muscle and mechanisms for controlling limb movement. Applications include gait analysis, sports biomechanics, and hand trajectory formation. Involves computer modeling of musculoskeletal systems.
PREREQ: MEEG112 and MEEG211.

MEEG 613 MECHANICAL PROPERTIES OF MATERIALS
See MEEG615 for course description.

MEEG 616 COMPOSITE MATERIALS STRUCTURES
Introduction to composite materials: anisotropic elasticity and laminate theory; plates and panels of composite materials; beams, columns and rods; composite material shell structures; energy methods; strength and failure theories; adhesive bonding and mechanical fastening; hygrothermal effects; stress analysis, buckling, vibrations and impact.

MEEG 617 COMPOSITE MATERIALS
Fiber and matrix materials, fiber-matrix interface, polymer, metal, ceramic, and carbon matrix composites, geometric aspects, elastic properties, laminate theory, strength of unidirectional composites, strength of laminates, durability, hybrid composites, flexible composites and textile structural composites.

MEEG 618 FRACTURE OF SOLIDS
Introduction to the field of fracture mechanics, covering both theoretical approaches and practical applications. Examines fundamentals of linear elastic and elastic-plastic fracture mechanics, and offers a short introduction to the basic premises and approaches for the treatment of dynamic fracture mechanics. May be crosslisted with MEEG618.

MEEG 619 MECHANICAL BEHAVIOR OF MATERIALS AND STRUCTURES
Examines how material properties influence structural response and failure mechanisms under the influence of external loads. Includes plasticity; thermal stresses; fracture and damage mechanics; and buckling. Problem solving based on both analytical methods and computational mechanics. May be crosslisted with CIEG619.
PREREQ: MEEG610 or similar.

MEEG 620 INTERMEDIATE DYNAMICS
Reference frames, angular velocity, linear velocity, angular acceleration, linear acceleration, multibody systems, inertia properties, kinetic energy, equations of motion, generalized d'Almbert's principles, numerical integration, computer simulation.

MEEG 621 OPTIMIZATION OF DYNAMIC SYSTEMS
Static optimization, numerical methods for static optimization, calculus of variations. Dynamic optimization: basic results, direct solution, indirect solution. Linear systems: finite time optimal control, steady state optimal control, multi-degree-of-freedom mechanical systems.
RESTRICTIONS: Undergraduates require permission of instructor.

MEEG 623 NONLINEAR DYNAMICS AND CHAOS
Nonlinear dynamics and chaotic phenomenon as applied to natural and engineering systems. Geometric and computational techniques, analytical methods for the qualitative analysis of dynamical systems modeled by differential equations and iterated maps. Planar and non-planar phase space analysis, local and global bifurcation analysis, catastrophes, resonances.
PREREQ: MATH351 or equivalent.

MEEG 624 CONTROL OF DYNAMIC SYSTEMS
Review of modeling and analysis of dynamic systems. Transient and steady-state responses. Introduction to the theory of feedback controls and stability for continuous time systems. Control system design studies via root-loci, frequency domain and state space methods. Brief introduction to digital controls.
PREREQ: MEEG211, MEEG311 and MATH352.

MEEG 630 INTERMEDIATE FLUID MECHANICS

MEEG 633 BIOENGINEERING FLUIDS AND TRANSPORT
Anatomy and physiology of pulmonary, cardiac, gastrointestinal, cerebrospinal and synovial systems. Applications of fluid, heat, and mass transport fundamentals to analysis of these biological systems.

MEEG 634 AIR POLLUTION PROCESSES
Physical, chemical, and meteorological processes that govern the photochemistry and transport of gas-phase and aerosol-phase air pollutants in the atmosphere. Topics to be covered include air quality, pollutant emissions, gas-phase and liquid-phase chemistry, aerosol dynamics, plumes, turbulent transport in geophysical flows, meteorology, and deposition.
RESTRICTIONS: Requires graduate standing in engineering.

MEEG 636 FLUID MECHANICS MEASUREMENTS
Pointwise velocity measurement including differential pressure measurement, hot-wire anemometry, and laser-Doppler anemometry. Global measurement techniques based on particle imaging and digital image processing. Signal processing, statistics, and uncertainty analysis.

MEEG 637 TWO-PHASE FLOW AND PARTICLE TECHNOLOGY
Modeling mass, momentum, heat transfer, and mixing in particle-laden flows, slurries, and bubbly flows. Issues in particle process industries such as particle separation, dispersion, agglomeration, transport, and handling. Particle measurements and characterization.
PREREQ: MEEG331.

MEEG 640 INTERMEDIATE HEAT TRANSFER
Theory and equations of heat conduction, boundary conditions, steady and transient heat conduction, the method of separation, forced convection in laminar flows, derivation of conservation equations, numerical methods.

MEEG 641 COMBUSTION
Fundamentals and application of combustion. Topics include thermodynamics, chemical kinetics, explosives and oxidative characteristics of fuels, combustion-generated pollutants; ignition and flammability phenomena; detonation; laminar in premixed flames; gaseous diffusion flames; and droplet combustion.
PREREQ: Graduate standing in engineering or science.
MEEG 642 INTRODUCTION TO FUEL CELLS
Basic principles of fuel cells, fuel cell types and their applications, fuel processing and hydrogen storage.
PREREQ: MEEG331, MEEG342, MEEG344

MEEG 652 FLOW OF VISCOUS MATERIALS
Applied fluid dynamics with an emphasis on flow processes dominated by viscous effects. Flow phenomena in polymeric, ceramic and composite materials. Modelling of flows in processing and manufacturing and its application to the design of molds and machinery.

MEEG 653 MANUFACTURING PROCESSES AND SYSTEMS
Explains key elements and concepts of basic processes, technologies, process systems and industries, current advances. Processes: packaging, plastic molding, food, pharmaceutical, metal cutting, forming. Technologies: robotics, numerical control, just-in-time inventory, ergonomics, material handling, quality management.
PREREQ: MEEG321 or consent of instructor.

MEEG 655 PRINCIPLES OF COMPOSITES MANUFACTURING
The fundamental principles involved in composites manufacturing will be introduced. Modeling of such processes will be emphasized with applications of injection molding, compression molding, filament winding, pultrusion and resin transfer molding.
PREREQ: MEEG332 and MEEG342

MEEG 658 METALS AND ALLOYS
Introductory alloy theory: free electron theory, metallic bonding, Alloy structure: solid solutions, ordered and intermetallic phases. Physical metallurgy: Mechanical properties and annealing. Production, applications and structure/property relationships of major engineering alloys, intermetallics, superalloys, metallic glasses.
PREREQ: MSEG302, MEEG321 or equivalent

MEEG 663 COMPUTER-AIDED DESIGN
Essentials of computer-aided design for engineers: specific topics include theory and application of computer graphics, introduction to data structures, numerical methods for curve and surface fitting and generation, and solid modeling.
PREREQ: MATH352

MEEG 671 INTRODUCTION TO ROBOTICS
Topics include: rigid motions and transformations, forward kinematics, Denavit-Hartenberg representations, inverse kinematics, velocity kinematics, dynamics, independent joint control, multi-variable control, force control.
PREREQ: Requires familiarity with kinematics and basic dynamics
RESTRICIONS: Recommended for seniors and graduate students.

MEEG 681 COMPUTER SOLUTIONS OF ENGINEERING PROBLEMS
Overview of numerical modeling in continuum mechanics. Case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities and limitations of consumer codes.

MEEG 682 CLINICAL BIOMECHANICS
The biomechanics and patho-mechanics of various human musculoskeletal joint systems. Normal joint anatomy and biomechanics; the mechanical effects of patholgy and the goals of surgical repairs to counteract them are explored in vitro, in vivo and mathematical modeling studies of joint system mechanics.

MEEG 683 ORTHOPEDIC BIOMECHANICS
Anatomy and physiology including microanatomy of bones, cartilage, tendon and muscle. Mechanical modeling of body including joint loads, motion analysis, muscle forces and interaction with orthopedic devices.
PREREQ: MEEG211 and MEEG215

MEEG 684 BIOMATERIALS AND TISSUE ENGINEERING
Biomaterials for mechanical replacement of Orthopaedic tissues: bone, cartilage, ligament, tendon and whole joint systems. Topics include normal tissue mechanics and bio-compatibility, mechanical behavior, degradation and host response to biomaterials. Experimental methods to assess biomaterials along with design and manufacturing considerations for joint and tissue replacements.

MEEG 690 INTERMEDIATE ENGINEERING MATHEMATICS

MEEG 801 ADVANCED THERMODYNAMICS
Critical examination of thermodynamic principles, equations of state for liquids, gases and mixtures. Interpretation of thermodynamic functions and applications to processes, reactions and equilibrium states.

MEEG 803 CONVECTION HEAT TRANSFER
Forced convection heat transfer in laminar and turbulent boundary layers including viscous dissipation effects. Forced convection heat transfer in pipes and external boundary layers. Free convection boundary layers.
PREREQ: MATH332

MEEG 805 SPECIAL TOPICS IN THERMODYNAMICS
Selection of topics that may include thermodynamics of irreversible processes, statistical mechanics, nonequilibrium statistical thermodynamics, thermodynamics of materials with memory, etc.

MEEG 811 SANDWICH STRUCTURES
Composite and isotropic sandwich structures are studied for stresses, deformations, buckling loads, natural frequencies and dynamic response under mechanical and environmental loads. Involving honeycomb, solid, foam, web and truss core sandwich comprising beam, plate, ring and shell structures. Design and minimum weight optimization are treated.

MEEG 813 THEORY OF ELASTICITY

MEEG 814 THEORY OF PLASTICITY
PREREQ: MEEG610 or MEEG813

MEEG 816 ADVANCED CONTINUUM MECHANICS
A rigorous study of kinematics of finite deformation and the field equations of mechanics and thermodynamics of continua. Tensor analysis employed throughout.

MEEG 817 COMPOSITE MATERIALS
May be cross-listed with MSEG817.
PREREQ: MEEG610 or MEEG616 or MEEG617

MEEG 818 PLATES AND SHELLS IN AEROSPACE STRUCTURES I

MEEG 819 PLATES AND SHELLS IN AEROSPACE STRUCTURES II
General theory of thin shells from three-dimensional equations of elasticity; shells of revolution under anlyx symmetric loads; asymmetric loads; thermoelastic effects; general bending theory, membrane theory, Inertional theory; Donnell equations; edge load solutions; orthotropic shells; laminated shells.

MEEG 821 ADVANCED DYNAMICS
General principles of spatial dynamics. Lagrangian and Hamiltonian methods. Application to engineering problems.

MEEG 823 VIBRATION ANALYSIS
Engineering analysis of the vibrations of machines and structures. Free, forced and random vibrations with emphasis on linear, multidegree-of-freedom systems by matrix and energy methods. Introduction to the Lagrangian method and normal coordinate analysis of complex systems.

MEEG 824 STRUCTURAL DYNAMICS AND CONTROL
Reviews vibration analysis of uniform/composite beams, plates and shells. Introduces analysis of structural sound radiation into enclosures and open field structural vibration controls and feedback strategies including modal, natural and optimal controls and uniform damping. Reduction of structural sound radiation by adaptive feedforward structural controls.
PREREQ: MEEG211, MEEG311 and MATH352.

MEEG 830 SPECIAL TOPICS IN FLUID MECHANICS
Offered occasionally and with varying subject matter. Topics may include turbulence, plasma kinetic theory, stability, etc.

MEEG 831 FLUID DYNAMICS
PREREQ: MATH630, MEEG690, or permission of instructor.
MEEG 832  Fluid Dynamics II  3
Rotational and irrotational flows, potential theory, airfoils, creeping motion, lubrication theory, wave motion, compressibility, supersonic flow and shock waves, and hydrodynamic stability.

MEEG 840  Special Topics in Continuum Mechanics  3
Study of advanced principles of continuum mechanics in one or more special fields. Topics selected by instructor. Special subjects may include open-ended problems. Areas of manufacturing include: injection molding, compression molding, filament winding, pultrusion and resin transfer molding.

MEEG 855  Principles of Composites Manufacturing  3
Fundamental principles and an application involving composites manufacturing will be introduced. Modelling of such processes will be emphasized and a specific project will be required. Assignments will include open-ended problems. Areas of manufacturing include: injection molding, compression molding, filament winding, pultrusion and resin transfer molding.

MEEG 856  Nanocrystalline and Nanocomposite Materials  3
Covers developments in polymer, ceramic and metal nano systems, current applications, major processing routes, and the novel mechanical and physical properties of nanocomposites.

MEEG 862  Advanced Engineering Analysis  3
Emphasis on asymptotic and perturbation methods. Topics from among the following: steepest descent and stationary phase, phase plane, asymptotic analysis of ODEs and PDEs using such methods as WKB, matched asymptotic expansions, Padé approximants, straining, and multiple scales; similarity methods, catastrophe theory; and chaos. Engineering applications.

MEEG 868  Research  1-9
Experimental investigation conducted for the purpose of contributing new useful data and theory in some field of mechanical engineering. Although supervised, investigation will be independent in character to encourage development of initiative.

MEEG 871  Random Vibrations  3

MEEG 872  Planning and Optimization of Dynamic Systems  3
Overview of cutting edge research methods in planning, control and optimization of dynamic systems that integrate tools from nonlinear systems theory, motion planning and functional optimization. RESTRICITIONS: Permission of instructor required.

MEEG 873  Applied Nonlinear Control  3
Review of analysis of nonlinear dynamic systems, lyapunov stability theory. Optimal control of nonlinear systems. Feedback linearization. Robust and adaptive sliding mode control and the backstepping design of sliding mode control. Feedback control of nonlinear systems. Discussion of current research topics of nonlinear control and their engineering applications. PREREQ: MEEG 824 or equivalent, MEEG 869 and MEEG 901, and permission of instructor.

MEEG 881  Advanced Musculoskeletal Biomechanics  3
Examines current topics in biomechanics research including musculoskeletal modeling, muscle physiology, anthropometric analysis, biomedical imaging techniques, neural control of movement and/or clinical biomechanics. PREREQ: MEEG 612 and MEEG 683.

MEEG 891  Advanced Engineering Mathematics  3
Integral transform and Green’s Function Solution of Partial Differential Equations, complex variables, variational calculus and introduction to perturbation methods. PREREQ: MEEG 901.

MEEG 964  Pre-Candidacy Study  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work. RESTRICTIONS: Not open to students who have been admitted to candidacy.

MEEG 969  Doctoral Dissertation  1-12 PF

MILITARY SCIENCE

MLSC 105  Introduction to Leadership I  1
Introduction to leadership principles using case studies, historical perspectives and hands-on leadership opportunities. Learn to rappel, use a map and compass, understand the basics of physical fitness and familiarize with Army traditions and ceremonies. No military obligation associated with this course.

MLSC 106  Introduction to Leadership II  1
Continues to build on the basics of MLSC105. Provides additional leadership opportunities and expands upon leadership theory. Learn basic rifle marksmanship, develop public presentation skills, and preview two years of physical fitness development. No military obligation associated with this course.

MLSC 205  Basic Leadership I  1
Enhances understanding of human behavior, leadership techniques and management and planning structures. Builds leadership competencies through leadership opportunities with structured evaluations and feedback. Learn about the various branches and job opportunities in the Army. No military obligation associated with this course.

MLSC 206  Basic Leadership II  1
Continues to build on the basics of MLSC205. Learn small unit tactics, how to handle up to ten people in stressful situations with feedback on performance. Further develop skills with map and compass, weapons safety and emergency first aid techniques for basic life saving. No military obligation associated with this course.

MLSC 215  Leader Development  4
An introductory six week off-campus, hands-on leadership education and assessment course. Real life individual and collective leadership challenges and opportunities. All expenses paid. Multiple scholarship opportunities. RESTRICTIONS: Permission of instructor required.

MLSC 305  Applied Leadership I  2
Advanced training in military leadership. One of two courses designed to prepare cadets for the ROTC Advanced Camp/Nurse Summer Training Program. Focuses on leadership development through multiple, small unit leadership opportunities and counseling. Fine tunes skills learned in the previous two years of Military Science, ROTC Basic Camp or prior military service, especially marksmanship, land navigation, drill and ceremonies and physical fitness. Commitment to military service required. RESTRICTIONS: Requires permission of instructor.

MLSC 306  Applied Leadership II  2
Continues to build on the basics of MLSC305. Completes preparation for Advanced Camp/Nurse Summer Training Program and focuses on leadership at the platoon and company level. Small unit tactics and training are emphasized. Information is provided to help the student make wise decisions about military service options. Commitment to military service required. PREREQ: MLSC305.

MLSC 315  Leader Evaluation  4
An advanced six week off-campus, hands-on leadership education and assessment course. Real life individual and collective leadership challenges and opportunities. All expenses paid. PREREQ: MLSC305 and MLSC306. RESTRICTIONS: Requires permission of instructor.

MLSC 365  Military History Studies  3
Selected topics in American military history, current military trends and future military requirements.

MLSC 366  Independent Study  1-3

MLSC 405  Advanced Leadership I  2
Prepares cadets for commissioning by refining professional skills and leadership ability. Students assigned leadership positions and function as commanders and staff officers in planning and executing cadre activities. Focuses on technical skills needed to accomplish assigned missions and other topics which expand cadet knowledge of Army systems and procedures. Commitment to military service required. PREREQ: MLSC305.

MLSC 406  Advanced Leadership II  2
Builds on leadership skills from MLSC405 and helps complete the transition from cadre to Lieutenant. Cadets are assigned new leadership positions to broaden their leadership experience. Focuses on officer professional development subjects needed to manage a military career and personal affairs. Commitment to military service required. PREREQ: MLSC306.

MLSC 466  Independent Study  1-3
MSEG 302 MATERIALS SCIENCE FOR ENGINEERS 3
Crystal binding and structure; energetics and structure of lattice defects; elasticity, plasticity, and fracture; phase equilibria and transformations; relations of structure and treatment to properties; structures of inorganic and organic polymers; and electronic and magnetic properties

MSEG 366 INDEPENDENT STUDY 1–6

MSEG 406 CORROSION AND PROTECTION 3
Degradation of structural materials through interaction with their environment. Electrochemical attack on alloys and its relation to metallographic structure. Forms of corrosion including high temperature oxidation and biological effects. Corrosion monitoring and deterioration of polymers, concrete and advanced materials. Emphasis on materials selection and corrosion methods. PREREQ: CHEM103/104 or equivalent, MSEG302 or consent of instructor. Physical chemistry helpful.

MSEG 410 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3
Study of the micromechanical and thermomechanical response of composite materials. Execution and assessment of experiments conducted to investigate strength and stiffness characteristics of composite materials. May be cross-listed with CIEG410.

MSEG 420 CAREER SURVIVAL OUTSIDE THE UNIVERSITY 1
Provides mechanisms to overcome cultural barriers existing between university and industrial cultures. Topics include leadership vs management, professional and cultural ethics, individual responsibility vs. teamwork, and networking and mentorship in accomplishing career goals. Includes guest speakers from local industries, technical writing, and oral communication exercises.

MSEG 446 SENIOR RESEARCH 1–6
Student will research general areas of materials science and/or engineering under the direction of a member of the materials science faculty or other faculty in science or engineering subject to the approval of the materials science chair. RESTRICTIONS: Open to seniors only. Science background required.

MSEG 466 INDEPENDENT STUDY 1–6

MSEG 601 STRUCTURE AND PROPERTIES OF POLYMER MATERIALS 3
Measurement and control of the microstructure and properties of solid polymers. Structure generation, structure-property models and effects of processing on properties. May be cross-listed with CHEG601. PREREQ: MSEG302.

MSEG 602 STRUCTURE OF MATERIALS 3

MSEG 603 ANALYTICAL TECHNIQUES IN MATERIALS SCIENCE 3

MSEG 604 PHASE TRANSFORMATIONS 3

MSEG 606 CORROSION AND PROTECTION 3
Degradation of structural materials through interaction with their environment. Electrochemical attack on alloys and its relation to metallographic structure. Forms of corrosion including high temperature oxidation and biological effects. Corrosion monitoring and deterioration of polymers, concrete and advanced materials. Emphasis on materials selection and corrosion control methods. PREREQ: CHEM103/104 or equivalent, MSEG302 or consent of instructor. Physical chemistry helpful.

MSEG 607 PHYSICAL PROPERTIES OF MATERIALS I 3
Basic models of electrical, magnetic optical and thermal properties of solid materials. Introduction to quantum physics to describe electronic structure of atoms, atomic bonds and crystals. Electronic, magnetic and optical effects in metals, semiconductors, ceramics, polymers and amorphous materials. Operation of basic electronic devices and semiconductor. PREREQ: MSEG302 and PHYS208.

MSEG 610 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3
Study of the micromechanical and thermomechanical response of composite materials. Execution and assessment of experiments conducted to investigate strength and stiffness characteristics of composite materials. May be cross-listed with CIEG610.

MSEG 615 MECHANICAL PROPERTIES OF MATERIALS 3

MSEG 616 CHEMISTRY AND PHYSICS OF SURFACES AND INTERFACES 3
See CHEG616 for course description.

MSEG 618 FRACTURE OF SOLIDS 3
See MSEG618 for course description.

MSEG 620 CAREER SURVIVAL OUTSIDE THE UNIVERSITY 1
Provides mechanisms to overcome cultural barriers existing between university and industrial cultures. Topics include leadership vs management, professional and cultural ethics, individual responsibility vs. teamwork, and networking and mentorship in accomplishing career goals. Includes guest speakers from local industries, technical writing, and oral communication exercises.

MSEG 624 PRACTICAL ELECTRON MICROSCOPY 3
Basic theories and in-depth practical aspects of scanning electron microscopy, transmission electron microscopy, elemental analysis, and sample preparation techniques. Hands-on oriented. For some lab assignments, students can be accommodated to prepare and analyze real samples from their own research.

MSEG 630 INTRODUCTION TO SCIENCE AND ENGINEERING OF POLYMER SYSTEMS 3
Provides an understanding of the science and engineering of macromolecules from a structure/property perspective. Topics include polymerization, chain structure and configuration, polymer size and shape, phase separation behavior, amorphous and crystalline state, glass-rubber transition, cross linking/rubber elasticity, viscoelasticity, rheology, polymer processing and mechanical behavior.

MSEG 632 POLYMER SYNTHESIS 3
Provides background in the theoretical and synthetic considerations of polymer synthesis. Topics include theoretical descriptions of molecular weight distributions, step growth polymerizations, chain growth polymerizations, living polymerizations, as well as chemical strategies for the productions of various polymers. Specialized topics in the current polymer chemistry literature may also be discussed.

MSEG 633 POLYMER SYNTHESIS AND CHARACTERIZATION LAB 3
Provides direct laboratory experience with the synthesis of a variety of conventional polymers via step growth, radical, and ionic polymerization methods. Polymers synthesized are also characterized via common polymer characterization methods such as IR spectroscopy, gel permeation chromatography, differential scanning calorimetry, and NMR spectroscopy. PREREQ: MSEG632.

MSEG 635 PRINCIPLES TO POLYMER PHYSICS 3
Chain statistics, thermodynamics, and kinetics are discussed in the context of modern polymer physics characterization techniques, such as dynamic and static light scattering and elastic/inelastic neutron scattering.

MSEG 666 SPECIAL PROBLEM 1–12

MSEG 803 EQUALIBRIA IN MATERIAL SYSTEMS 3
MSE 804  KINETICS IN MATERIAL SYSTEMS  3  
PREREQ: MSEG302  

MSE 806  PHYSICAL PROPERTIES OF SOLIDS  3  

MSE 807  PHYSICAL PROPERTIES OF MATERIALS II  3  
Continuation of MSEG607 with emphasis on the electrical transport properties of material. Topics will include electronic structure and energy band diagrams of semiconductors, metals and insulators; Fermi surfaces; dynamics of electrons; Semiconductor materials and devices; band structure and transport properties of selected semiconductors; bandgap engineering; novel materials systems; electron emission; particularly field emission.  
PREREQ: MSEG607  

MSE 811  ADVANCED TOPICS IN MATERIALS  1–3  
Discussion of a topic of current interest in the science or engineering of materials.  
See MSEG817 for course description.  

MSE 817  COMPOSITE MATERIALS  3  
See MSEG817 for course description.  

MSST 431  TECHNOSCIENCE IN ART AND ART HISTORY  3  
See MSST431 for course description.  

MSST 444  TECHNOLOGY OF CULTURAL MATERIALS: CERAMICS AND GLASS  3  
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic ceramic and glass objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions.  
May be cross-listed with ANTH444 and/or ARTC444.  

MSST 445  TECHNOLOGY OF CULTURAL MATERIALS: METALS  3  
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic metal objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions.  
May be cross-listed with ANTH445 and/or ARTC445.  

MSST 463  HISTORICAL ARCHAEOLOGY AND THE PUBLIC  3  
See ANTH463 for course description.  

MSST 490  STUDIO IN THE MATERIALS AND TECHNIQUES OF PAINTING I  3  
Major masters and the materials, tools, supports and techniques of indirect and direct oil painting and panel painting in tempera from about 1500 BC to AD 1500. Topics include the development and manufacture of paint studied. Major topics include color interaction and the Munsell system of color description. Lecture-studio presentation covering analytical and practical aspects of mixing and matching colorants without instrumentation. Pigments, dyes and the manufacture of paint studied. Major topics include color interaction and the Munsell system of color description.  
May be cross-listed with ART429, ARTC489, and/or ARTH489.  
RESTRICTIONS: Requires permission of instructor.  

MSST 492  STUDIO MATERIALS AND TECHNIQUES OF PAINTING II  3  
Major masters and the materials, tools and techniques of indirect and direct oil painting. Time frame: ca. 1400 to the present. Major topics include the development of canvas, brushes, oil paint, mediums, varnishes, solvents and the complex relationship between indirect and direct techniques. Includes studio reconstruction of masterworks, lectures and library research.  
May be cross-listed with ART429, ARTC489, and/or ARTH489.  
RESTRICTIONS: Requires permission of instructor.  

MSST 498  STUDIO IN THE MATERIALS AND TECHNIQUES OF PRINTMAKING I  3  
Major masters and the materials, tools and techniques of relief, planographic and intaglio printmaking. Time frame: ca. 1400–1920. Major topics include woodcut, copperplate engraving, etching, drypoint, aquatint, mezzotint, lithography and wood engraving. Studio reconstructions, lectures and library research.  
May be cross-listed with ART429, ARTC490, and/or ARTH490.  
RESTRICTIONS: Requires permission of instructor.  

MSST 500  STUDIO IN THE MATERIALS AND TECHNIQUES OF PRINTMAKING II  3  
Major masters and the materials, tools and techniques of relief, planographic and intaglio printmaking. Time frame: ca. 1400–1920. Major topics include woodcut, copperplate engraving, etching, drypoint, aquatint, mezzotint, lithography and wood engraving. Studio reconstructions, lectures and library research.  
May be cross-listed with ART429, ARTC490, and/or ARTH490.  
RESTRICTIONS: Requires permission of instructor.  

MSST 606  ISSUES IN NORTH AMERICAN MATERIAL CULTURE  3  
See EAMC606 for course description.  
RESTRICTIONS: Requires permission of instructor.  

MSST 608  PUBLIC HISTORY: RESOURCES, RESEARCH, AND PRACTICE  3  
See Hist608 for course description.  

MSST 629  SEMINAR IN HISTORY PRESERVATION  3  
See UAPP629 for course description.
MSST 644 Technology of Cultural Materials: Ceramics and Glass
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic ceramic and glass objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH644 and/or ARTC644.

MSST 645 Technology of Cultural Materials: Metals
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic metal objects from the point of view of technology, aesthetics, and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH645 and/or ARTC645.

MSST 663 Historical Archaeology and the Public
See ANTH663 for course description.

MSST 680 Studio in the Materials and Techniques of Drawing in the West
Lecture-studio presentation on materials and tools, supports and techniques of wet and dry media drawing in the West from about the year 1400 to the present. Topics include: the development and manufacture of paper, pens, brushes, inks, watercolor paint, charcoal, metal points, graphite pencils, natural and fabricated chalks, crayons, pastels, pastel fixatives and fixatives. Studio reconstructions of masterworks, lectures and library research. May be cross-listed with ART680, ARTC680, and/or ARTH680. RESTRICTIONS: Requires permission of instructor.

MSST 681 Materials and Techniques of the Contemporary Painter and Draftsman
Twentieth-century artists' materials. Topics: acrylic emulsion and acrylic solution alkyd resin, PVA paint; collage-assemblage; solvent-paint transfer; synthetic fiber canvas, paper, panels, oil pastels, paint sticks, felt tip markers, colored inks and pencils; airbrush spray gun; and non-art materials. Potential health hazards. Conservation topics: pH, lightfastness, adhesion and storage environments. Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors without instrumentation. Pigments, dyes, and the manufacture of paint studied. Major topics include color interaction, and the Munsell system of color description. May be cross-listed with ART685 and/or ARTC685. RESTRICTIONS: Requires permission of instructor.

MSST 688 Studio Materials and Techniques of Painting I
Major masters and the materials, tools, supports and techniques of architectural and panel painting in tempera from about 1500 BC to AD 1500. Topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research. May be cross-listed with ART688, ARTC688, and/or ARTH688. RESTRICTIONS: Requires permission of instructor.

MSST 689 Studio Materials and Techniques of Painting II
Major masters and the materials, tools and techniques of direct and indirect oil painting. Time frame: 1500 to the present. Topics include the development of canvases, brushes, oil paint, mediums, varnishes, solvents and the complex relationship between indirect and direct techniques. Includes studio reconstruction of masterworks, lectures and library research. May be cross-listed with ART689, ARTC689, and/or ARTH689. RESTRICTIONS: Requires permission of instructor.

MSST 690 Studio in the Materials and Techniques of Printmaking I
Major masters and the materials, tools, and techniques of relief, planographic and intaglio printmaking. Time frame: ca. 1400-1920. Major topics include woodcut, copperplate engraving, etching, drypoint, aquatint, mezzotint, lithograph and wood engraving. Studio reconstructions, lectures and library research. May be cross-listed with ART690, ARTC690, and/or ARTH690. RESTRICTIONS: Requires permission of instructor.

MSST 801 Museum Curatorship: Collections Management
A course on collections management theory and practices that focuses on the administration, handling, physical care, recording and study of museum collections. Combines classroom instruction, demonstrations and field trips with "hands-on" projects in the University Gallery and other area museums. RESTRICTIONS: Open to graduate students only.

MSST 802 Leadership and Management of Museums
Treats governance and administrative operations of museums, highlighting planning, legal and organizational structure, trustees and directors, personnel management, finance, development, marketing, merchandising, maintenance and security, libraries and archives, publishing, computer applications, public programming, cultural tourism and professional standards and ethics. RESTRICTIONS: Open to graduate students only. Includes field trips and team task force project.

MSST 803 Museums and Modern Technology
Examines the use of digital technology in museums. Topics include communication strategies, digital image processing, collections databases, geographic information systems, CAD, animation, exhibitions, and web design. Students will plan and prepare a web site that deals with a museum-related topic.

MSST 804 Museum Internship
Internship practice in administration, collections management, exhibition and interpretation at museums and related institutions. Students spend ten full weeks, or the equivalent, at the University museum, Winterthur Museum, Hagley Museum, Longwood Gardens or other acceptable institution. May be cross-listed with MUSE604. RESTRICTIONS: Open to graduate students only. Requires at least one semester course in museum studies and permission of instructor.

MSST 805 Historical Properties
Administration and interpretation of historical properties, including historic site surveys, preservation research, building restoration, conservation techniques and the establishment and attainment of interpretive objectives. Field trips to area historic sites. Combines classroom instruction and work projects at area historic sites. RESTRICTIONS: Open to graduate students only.

MSST 807 Museum Curatorship: Temporary and Economical Exhibits
Focuses on the planning, designing and fabrication of economical museum exhibits for changing exhibition rooms and alternative spaces. Emphasizes time-, money- and labor-saving techniques. Students design and produce a temporary exhibit in the University Gallery or in a local museum. RESTRICTIONS: Open to graduate students only.

MSST 808 Museum Education and Interpretation
The theory, strategies, practices, evaluation and administration of learning in a museum environment with emphasis on interpretation of collections through a variety of instructional means. Lectures, discussions, field trips, program planning, curriculum development, proposal writing, audience studies, practice teaching and special project work with area museums. RESTRICTIONS: Open to graduate students only.

MSST 810 Environmental Institution Management
Seminar at Delaware Nature Society headquarters with staff and guest lecturers including attorneys, investment counselors, University faculty and museum educators. Experiences at area environmental institutions. Covers goal definition, long-range planning, building/grounds management, programming, fund raising, financial management, personnel policies, ethics, volunteers, publicity and publications, legal considerations and conservation/preservation roles. RESTRICTIONS: Open to graduate students only. Permission of instructor required.

Music Education

MUED 179 Freshman Seminar in Music Education
Introduction to issues and approaches in music education. Helps students examine their own interests and aptitude for teaching while presenting discussion on current trends in the profession and attributes of successful teachers. Provides guidelines for developing student portfolios. RESTRICTIONS: Offered fall semester only.

MUED 279 Practicum in Music Education
Observation of differing elementary and secondary school music program structures; studies and observations of children's growth and development patterns in terms of music learning; and experience in music instructional methods. RESTRICTIONS: Requires permission of instructor. Offered fall semester only.

MUED 336 Choral Conducting
Specific problems in conducting choral literature. Comparative analysis of works to be conducted. PREREQ: MUSC335. RESTRICTIONS: For vocal music education majors. Offered spring semester only.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 101</td>
<td>INTRODUCTION TO OPERA</td>
<td>3</td>
<td>Introduction to opera, concentrating on opera comique, singspiel, operetta, baroque opera, seria, and Wagnerian music drama. Explores philosophies associated with music in the context of opera. Time span covered is 1607 to present. PREREQ: MUSC 105.</td>
</tr>
<tr>
<td>MUSC 102</td>
<td>APPRECIATION</td>
<td>3</td>
<td>Continuation of MUSC 101. Survey and analytical approach to music styles. Composing original works for voice and instruments. PREREQ: MUSC 105.</td>
</tr>
<tr>
<td>MUSC 103</td>
<td>MUSIC FOR THE PRIMARY SCHOOL</td>
<td>3</td>
<td>The study of various styles of rock music. Introduction to folk, country, blues, and jazz as predecessors to rock. Intended for the non-music major. No music reading skills required. May be cross-listed with MUSC 107. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 104</td>
<td>INTRODUCTION TO OPERA</td>
<td>3</td>
<td>The study of various styles of rock music. Introduction to folk, country, blues, and jazz as predecessors to rock. Intended for the non-music major. No music reading skills required. May be cross-listed with MUSC 107. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 105</td>
<td>FUNDAMENTALS OF MUSIC</td>
<td>3</td>
<td>The study of various styles of rock music. Introduction to folk, country, blues, and jazz as predecessors to rock. Intended for the non-music major. No music reading skills required. May be cross-listed with MUSC 107. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 106</td>
<td>FUNDAMENTALS OF MUSIC II</td>
<td>3</td>
<td>The study of various styles of rock music. Introduction to folk, country, blues, and jazz as predecessors to rock. Intended for the non-music major. No music reading skills required. May be cross-listed with MUSC 107. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 107</td>
<td>HISTORY OF ROCK</td>
<td>3</td>
<td>The study of various styles of rock music. Introduction to folk, country, blues, and jazz as predecessors to rock. Intended for the non-music major. No music reading skills required. May be cross-listed with MUSC 107. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 108</td>
<td>UNIVERSITY SINGERS</td>
<td>1</td>
<td>University Singers is a chorus of sopranos and altos. Satisfies the Fine Arts requirement for Elementary Education majors. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 109</td>
<td>SCHOLA CANTORUM</td>
<td>1</td>
<td>Schola Cantorum is a chorus of sopranos and altos. Satisfies the Fine Arts requirement for Elementary Education majors. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 110</td>
<td>CHORALE</td>
<td>1</td>
<td>Chorale is the university's most select chorus of mixed voices. RESTRICTIONS: Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 111</td>
<td>MARCHING BAND</td>
<td>1</td>
<td>Marching Band is a 45-member group of woodwind, brass and percussion players that performs original band music, chamber music and transcriptions. The Marching Band performs at all University-sponsored events. RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 112</td>
<td>SYMPHONIC BAND</td>
<td>1</td>
<td>Symphonic Band is a 45-member group of woodwind, brass and percussion players that performs original band music, chamber music and transcriptions. The Marching Band performs at all University-sponsored events. RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 113</td>
<td>WIND ENSEMBLE ORCHESTRAL WINDS AND PERCUSSION</td>
<td>1</td>
<td>Wind Ensemble orchestral winds and percussion is a 45-member group of woodwind, brass and percussion players that performs original band music, chamber music and transcriptions. The Marching Band performs at all University-sponsored events. RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 114</td>
<td>JAZZ ENSEMBLE</td>
<td>1</td>
<td>Jazz Ensemble is a 45-member group of woodwind, brass and percussion players that performs original band music, chamber music and transcriptions. The Marching Band performs at all University-sponsored events. RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 115</td>
<td>PERCUSSION ENSEMBLE</td>
<td>1</td>
<td>Percussion Ensemble is a 45-member group of woodwind, brass and percussion players that performs original band music, chamber music and transcriptions. The Marching Band performs at all University-sponsored events. RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.</td>
</tr>
<tr>
<td>MUSC 116</td>
<td>STEEL BAND</td>
<td>1</td>
<td>Steel Band is a 45-member group of woodwind, brass and percussion players that performs original band music, chamber music and transcriptions. The Marching Band performs at all University-sponsored events. RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.</td>
</tr>
</tbody>
</table>
MUSC 125  Collegium Musicum 1
Ensemble for the performance of instrumental and vocal music of the Medieval, Renaissance and Early Baroque periods. Size, instrumentation and repertoire for the group varies from semester to semester dependent upon resources at hand, players' skills and other factors.
PREREQ: Audition
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 150  Freshman Honors Private Study 1
Private study for qualified freshman honors students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: Requires audition
RESTRICTIONS: Restricted to Honors students only. May be repeated for credit. Offered in fall and spring semesters.

MUSC 151  Private Study for Bachelor of Music I 2
Private study for freshman bachelor of music students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC151.
RESTRICTIONS: For bachelor of music students only. Offered in fall and spring semesters.

MUSC 152  Private Study for Bachelor of Music II 2
Continuing private study for freshman bachelor of music students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC151.
RESTRICTIONS: For bachelor of music students only. Offered in fall and spring semesters.

MUSC 153  Private Study for Bachelor of Arts and Minors I 2
Private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: Audition and acceptance into Bachelor of Music Program.
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Offered in fall and spring semesters.

MUSC 154  Private Study for Bachelor of Arts and Minors II 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC153.
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Offered in fall and spring semesters.

MUSC 155  Private Study for Secondary and Merit I 1
Private study for music majors pursuing a secondary area, and qualified students not enrolled in a music degree program. Student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. May be repeated for credit.
PREREQ: Audition
RESTRICTIONS: Offered in fall and spring semesters.

MUSC 177  Class Guitar I 1
Introduction to the fundamentals of guitar technique and note reading for non-music majors. Topics include guitar history, repertoire, scales and exercises with an emphasis on classical as well as folk music. Music Education majors may also find this course particularly useful for classroom teaching.
RESTRICTIONS: Offered in fall and spring semesters.

MUSC 178  Class Guitar II 1
A continuation of Class Guitar I with a stronger emphasis on ensemble playing and development of a repertoire.
PREREQ: MUSC177
RESTRICTIONS: Offered in spring semester only.

MUSC 179  Organ Class 1
Students learn the basic techniques needed to play the organ. Students apply these skills in a class setting, focusing on introductory organ literature and hymn playing.
RESTRICTIONS: Requires permission of instructor.

MUSC 181  Private Study for Applied Jazz Styles and Techniques 2
Private studio instruction covering improvisational techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
PREREQ: MUSC181
RESTRICTIONS: Requires audition. Offered in spring and fall semesters.

MUSC 182  Private Study for Applied Jazz Styles and Techniques 2
Private studio instruction covering improvisational techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
PREREQ: MUSC181
RESTRICTIONS: Requires audition. Offered in spring and fall semesters.

MUSC 185  Ear Training and Sight Singing I 2
Techniques of sight singing and music reading skills. Development of ability in the aural recognition of melody, harmony and rhythm.
PREREQ: MUSC095, passing grade on departmental music theory test
COREQ: MUSC195
RESTRICTIONS: Requires permission of instructor. Offered in fall semester only.

MUSC 186  Ear Training and Sight Singing II 2
Techniques of sight singing and music reading skills. Development of ability in the aural recognition of melody, harmony and rhythm
PREREQ: MUSC185 and MUSC195
COREQ: MUSC196
RESTRICTIONS: Offered in spring semester only.

MUSC 193  Sight Reading at the Keyboard I 1
Techniques for improving coordination and musical comprehension when playing from sight at the keyboard.
RESTRICTIONS: For keyboard majors. Offered in fall and spring semesters.

MUSC 194  Sight Reading at the Keyboard II 1
Continuation of MUSC193
PREREQ: MUSC193
RESTRICTIONS: Offered in fall and spring semesters.

MUSC 195  Harmony I 3
PREREQ: MUSC095, MUSC105, or passing grade on departmental music theory test
COREQ: MUSC185
RESTRICTIONS: Offered in fall semester only.

MUSC 196  Harmony II 3
Continuation of harmony: diatonic through chromatic harmony with keyboard application. Chord structures and functional relationships. Basic melodic and contrapuntal compositional techniques. Writing, playing and analysis.
PREREQ: MUSC185 and MUSC195
COREQ: MUSC186
RESTRICTIONS: Offered in spring semester only.

MUSC 197  Jazz Harmony 3
Study of elementary aspects of melody, harmony, texture, dynamics, rhythm and form in selected jazz and American popular literature. Development of elementary aural-perceptual and compositional skills related to jazz and American popular music.
PREREQ: MUSC105
RESTRICTIONS: Offered in odd numbered years, fall semesters only.

MUSC 205  Music of the Non-Western World 3
Survey of non-Western world musical cultures utilizing textbook, reprinted reserve articles, films and in-class performance/demonstrations. Goal is the understanding and appreciation of various world musics.
PREREQ: MUSC105
MUSC 206 MUSIC OF CHINA, KOREA AND JAPAN
Syste matically examines the origin and historical development of the musical cultures of the Far East. Studies how the musical and cultural influence of Chinese musical culture has had an enormous impact on the development of such cultures in Korea and Japan.

MUSC 207 HISTORY OF JAZZ
Chronological study of the style changes in jazz from the late 19th century to the present. Emphasis on the sociological, economic and technological influences of the period and on the principal personalities who have been primarily responsible for change. May be cross-listed with BAMS 207. PREREQ: MUSC 105
RESTRICTIONS: Offered in spring semester only

MUSC 209 HISTORY OF SPANISH MUSIC
Covers the most outstanding traditions of Spanish music, including Arab-influenced Andalusian music, 13th century music, schools of the “Renacimiento”, 17th century court music, the “Zarzuela”, 19th century Nationalism, and the most modern tendencies of the 20th century. RESTRICTIONS: Taught abroad only

MUSC 210 MUSIC OF BRITAIN
Chronological study of music of Britain with emphasis on English music from 1485 to present. Explores music for various media (including choral, instrumental, opera) and principal British composers, relating the development of musical styles to events in British history. When taught as part of UD London Semester, will include attendance at variety of London performances. RESTRICTIONS: Requires permission of instructor.

MUSC 211 INTRODUCTION TO MUSIC HISTORY
Survey of selected works in music history with emphasis on selected basic terminology, forms and style changes, through score reading and listening. PREREQ: MUSC 195
RESTRICTIONS: Offered in full semester only

MUSC 212 HISTORY OF LITURGY AND HYMNS
Study of the evolution, structure and content of historic liturgies and of the hymnody which developed within them. Includes an examination of Jewish and Eastern elements while focusing on the texts and music of the services and hymns of various traditions within the Western Church.

MUSC 213 FRENCH MUSICAL CULTURE
Explores the contributions of French culture to the history of Western Music. Special focus on major trends in music written and performed in Paris from the Middle Ages through the 20th century, and on the musical institutions that made Paris a world capital of music. RESTRICTIONS: Taught abroad only

MUSC 214 STRINGED INSTRUMENTS CLASS: VIOLIN, VIOLA, CELLO, BASS
Development of performing and teaching skills. RESTRICTIONS: Open only to students whose major requires this course. Offered fall and spring semesters.

MUSC 215 HIGH BRASS INSTRUMENTS CLASS
Development of performing and teaching skills. RESTRICTIONS: MUSC 215 and MUSC 216 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered fall semester only

MUSC 216 LOW BRASS INSTRUMENTS CLASS
Development of performing and teaching skills. RESTRICTIONS: MUSC 215 and MUSC 216 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered spring semester only.

MUSC 217 WOODWIND INSTRUMENTS CLASS I
Development of performing and teaching skills. RESTRICTIONS: MUSC 217 and MUSC 218 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered fall semester only.

MUSC 218 WOODWIND INSTRUMENTS CLASS II
Development of performing and teaching skills. RESTRICTIONS: MUSC 217 and MUSC 218 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered spring semester only.

MUSC 219 PERCUSSION INSTRUMENTS
Development of performing and teaching skills. RESTRICTIONS: Open only to students whose major requires this course. Offered spring semester only.

MUSC 220 MARCHING BAND TECHNIQUES
Focuses on designing and charting a show of the complete contemporary marching band. Overview of history and development of the marching band, as well as “hands-on” sessions in marching percussion and color guard. PREREQ: Students must have at least one semester participation in the UD Marching Band.
RESTRICTIONS: Offered spring semester only

MUSC 221 MARCHING PERCUSSION TECHNIQUES
Focuses on advancing skills on the marching snare drum, multi-tom-toms, bass drum, cymbals or front ensemble. Emphasizes techniques through an opportunity to learn basic arranging skills. Open to students of all skill levels. RESTRICTIONS: Offered spring semester only

MUSC 241 ACCOMPANYING CHAMBER MUSIC: PIANO
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard. PREREQ: Sight-Reading Placement Test. RESTRICTIONS: Requires permission of instructor. Offered fall and spring semesters. May be repeated 4 times for credit.

MUSC 251 PRIVATE STUDY FOR BACHELOR OF MUSIC III
Continuing private study for sophomore bachelor of music students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. PREREQ: MUSC 152.
RESTRICTIONS: For bachelor of music students only. Offered fall and spring semesters.

MUSC 252 PRIVATE STUDY FOR BACHELOR OF MUSIC IV
Continuing private study for sophomore bachelor of music students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. PREREQ: MUSC 251.
RESTRICTIONS: For bachelor of music students only. Offered fall and spring semesters.

MUSC 253 PRIVATE STUDY FOR BACHELOR OF ARTS AND MINORS III
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. PREREQ: MUSC 154.
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Offered fall and spring semesters.

MUSC 254 PRIVATE STUDY FOR MUSIC BACHELOR OF ARTS AND MINORS IV
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. PREREQ: MUSC 253.
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Offered fall and spring semesters.

MUSC 271 DICTION: GERMAN
A study of pronunciation rules for singing in German. Includes practical information about the organ: its history, use and literature as well as tonal and mechanical aspects of its design.

MUSC 272 DICTION: FRENCH
A study of pronunciation rules for singing in French. Includes practical information.

MUSC 275 CLASS PIANO: INTERMEDIATE I
Piano techniques applicable to the levels and needs of the students; a continuation of reading and transposition; and improvisation and repertoire of grade two pieces. PREREQ: MUSC 176 and MUSC 196
RESTRICTIONS: Offered fall semester only

MUSC 276 CLASS PIANO: INTERMEDIATE II
A continuation of MUSC 275. PREREQ: MUSC 275
RESTRICTIONS: Offered spring semester only

MUSC 279 INTRODUCTION TO THE ORGAN
Designed to provide information about the organ: its history, use and literature as well as tonal and mechanical aspects of its design.
MUSC 281  PRIVATE STUDY FOR APPLIED JAZZ STYLES AND TECHNIQUES  2
Private studio instruction covering improvisational techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
PREREQ: MUSC181.
RESTRICTIONS: Requires permission of instructor. Offered fall and spring semesters.

MUSC 282  PRIVATE STUDY FOR APPLIED JAZZ STYLES AND TECHNIQUES  2
Private studio instruction covering improvisational techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
PREREQ: MUSC181, MUSC182, MUSC281.
RESTRICTIONS: Requires audition. Offered fall and spring semesters.

MUSC 283  PRIVATE STUDY FOR APPLIED JAZZ STYLES AND TECHNIQUES  2
Private studio instruction covering improvisational techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
PREREQ: MUSC181, MUSC182, MUSC281.
RESTRICTIONS: Requires audition. Offered fall and spring semesters.

MUSC 285  ADVANCED EAR TRAINING AND SIGHT SINGING  1
Continuation of MUSC185 and MUSC186.
PREREQ: MUSC185 and MUSC196.
COREQ: MUSC295.
RESTRICTIONS: Offered fall and spring semesters.

MUSC 286  ADVANCED EAR TRAINING AND SIGHT SINGING  2
Continuation of MUSC185, MUSC186 and MUSC285.
PREREQ: MUSC285 and MUSC295.
COREQ: MUSC296.
RESTRICTIONS: Offered spring semester only.

MUSC 287  MUSIC TECHNOLOGY I  3
Overview and experience with commercially-available music-related hardware and software. Hardware includes IBM and Macintosh microcomputers, electronic keyboards and tone generators incorporating Musical Instrument Digital Interface (MIDI), digital recording systems, CD-ROM and videodisc. Software includes sequencers, notation packages, interactive composers, educational programs and hypermedia applications.
PREREQ: MUSC105 or MUSC195.
RESTRICTIONS: Offered fall and spring semesters.

MUSC 291  PRACTICUM IN CHURCH MUSIC  1
Introduces a variety of skills, techniques and information needed in the practice of church music. Students will learn to apply these skills through in-class experience with various instruments and resources.

MUSC 292  ORGAN IMPROVISATION AND SERVICE PLAYING  2
Student learns and applies skills used in improvising at the organ and playing for church services. A basic conducting component is included.
RESTRICTIONS: Offered spring semester only.

MUSC 295  ADVANCED HARMONY I  3
PREREQ: MUSC186 and MUSC196.
COREQ: MUSC286.
RESTRICTIONS: Offered fall semester only.

MUSC 296  ADVANCED HARMONY II  3
Continuation of MUSC295. Study of late 19th and 20th century harmony, techniques and styles. Continuation of instrumentation. Original compositions.
PREREQ: MUSC285 and MUSC295.
COREQ: MUSC286.
RESTRICTIONS: Offered spring semester only.

MUSC 298  BEGINNING MUSIC COMPOSITION  1
Private study in beginning composition. Creative writing in vocal and instrumental media.
RESTRICTIONS: Permission of instructor required. May be repeated for up to 4 credits. Offered fall and spring semesters.

MUSC 301  JUNIOR RECITAL  0 PF
A 30-minute public recital.
RESTRICTIONS: Requires junior status.

MUSC 302  WOMEN IN MUSIC: AN ALTERNATE SURVEY  3
Survey of women's contributions to Western art music traditions from 12th century to present day through the study of women as composers, performers, patrons, and as the subject of musical expression. Explores cultural systems that have alternatively encouraged and suppressed women's creativity. May be cross-listed with WOMS302.

MUSC 309  PATTERNS OF PATRONAGE  3
Examines the creation, performance and transmission of music within broader context of the economic, political, social and technological environment. Emphasizes interdependency of musical activity and its patrons, including traditional functions of state, church, civic, mercantile, private; also contemporary interaction with public, private, and third sectors.
RESTRICTIONS: Open to juniors and seniors.

MUSC 310  CHURCHES AND CATHEDRALS OF LONDON  3
A study of ecclesiastical architecture of the 12th-20th centuries, noting structure, architectural style & historical role, as well as the way in which music, liturgy and the visual arts unfold within each building.
RESTRICTIONS: Taught in London only.

MUSC 311  MUSIC HISTORY: 400 THROUGH 1600  3
The history of musical style and theory during the Middle Ages (5th through 14th centuries) and the Renaissance (15th and 16th centuries).
PREREQ: MUSC211 or permission of instructor.
RESTRICTIONS: Offered spring semester only.

MUSC 312  MUSIC HISTORY: 1600 THROUGH 1827  3
The history of musical style and theory during the Baroque period (1600-1750), and the Classic period through the death of Beethoven (1827).
PREREQ: MUSC211 or MUSC101.
RESTRICTIONS: Offered full semester only.

MUSC 313  MUSIC HISTORY: 1827 TO THE PRESENT  3
The Romantic era, Impressionism and the 20th century. Musical thought and style from 1827 to the present.
PREREQ: MUSC211 or MUSC101.
RESTRICTIONS: Offered spring semester only.

MUSC 321  ENSEMBLE: INSTRUMENTAL, PIANO, OR VOCAL  1
Performance of chamber literature for instrument, piano or voice.
RESTRICTIONS: May be repeated for credit. Offered fall and spring semesters.

MUSC 328  CHORAL LITERATURE  2
Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1500.
PREREQ: MUSC211.
RESTRICTIONS: Offered fall semester only.

MUSC 335  BASIC CONDUCTING  2
The principles of conducting and score reading.
PREREQ: MUSC286 and MUSC296.
RESTRICTIONS: Offered fall semester only.

MUSC 339  VIENNESE COMPOSERS  3
Selected Viennese composers including Mozart, Beethoven, Schubert and the Strauss. Emphasis on Viennese music. A combination of music history and music appreciation.
RESTRICTIONS: Taught in Semester in Vienna program only.

MUSC 345  HISTORY OF THEATRE: AMERICAN MUSICAL THEATRE  3
Musical and dramatic forms of the 19th, 19th and 20th centuries in the United States and their impact on the modern musical theatre. Complete works read and compared to a series of criteria that are found in successful modern shows. Comparison of earlier and current works.
May be cross-listed with THEA345.
RESTRICTIONS: Offered fall semester only.

MUSC 351  PRIVATE STUDY FOR MUSIC EDUCATION V  2
Continuing private study for junior music education majors. The student adds to the course title the branch of study elected; piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC252.
RESTRICTIONS: For music education majors only. Offered fall and spring semesters.

MUSC 352  PRIVATE STUDY FOR MUSIC EDUCATION VI  2
Continuing private study for junior music education majors. The student adds to the course title the branch of study elected; piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC254.
RESTRICTIONS: For music education majors only. Offered fall and spring semesters.

MUSC 353  PRIVATE STUDY FOR BACHELOR OF ARTS AND MINORS V  2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected; piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC254.
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts degree credit. Offered fall and spring semesters.
MUSC 354  Private Study for Music Bachelor of Arts and Minors VI  2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC355, permission of instructor
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts credit. Offered in fall and spring semesters.

MUSC 357  Private Study for Applied Music V  3
Continuing private study for junior applied music majors, including preparation for Junior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC252
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 358  Private Study for Applied Music VI  3
Continuing private study for junior applied music majors, including preparation for Junior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC357
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 363  Keyboard Literature  3
Style, structure and technical performance of keyboard music from the 17th century to the present.
PREREQ: MUSC262

MUSC 366  Independent Study  1-3
PREREQ: MUSC350

MUSC 387  Music Technology II  3
Explores intermediate to advanced applications of music technology including professional level implementation of MIDI hardware and software. Topics include multiport interfaces, synchronization, MIDI sequencing and notation techniques, multimedia, and music related Internet services. Additional topics may be examined depending on student experience.
PREREQ: MUSC287

MUSC 389  Elements of Music Management  3
Introduces principles involved in planning and management for performing arts organizations. Includes basic concepts of project development and implementation, production issues for public performances, communication skills and marketing techniques, utilization of new technologies, and aspects of resource planning and advocacy.
RESTRICTIONS: Open to juniors and seniors.

MUSC 390  Honors Colloquium  3
See ARSC390 for course description.
May be cross-listed with ENGL391.

MUSC 392  Contrapuntal Writing  2
Contrapuntal techniques with emphasis on 16th- and 18th-century styles and forms.
PREREQ: MUSC295
RESTRICTIONS: Offered in odd numbered years, spring semesters only.

MUSC 393  Keyboard Harmony  2
A practical course for the development of facility in applying knowledge of harmony to the keyboard. Emphasis on melody harmonization and improvisation.
PREREQ: MUSC296
RESTRICTIONS: Requires two years of class or private piano. Offered in even numbered years, spring semesters only.

MUSC 395  Form Analysis  3
Structure of homophonic and polyphonic music representing different periods of musical history.
PREREQ: MUSC296
RESTRICTIONS: Offered in even numbered years, spring semesters only.

MUSC 400  Internship in Church Music  1-3
Capstone course for Church Music minor providing students with opportunities to gain skills and knowledge through practical application while working under the supervision of professional musicians.
PREREQ: MUSC179, MUSC212, MUSC291 and MUSC292.
RESTRICTIONS: Requires permission of instructor.

MUSC 401  Senior Recital  0 PF
A 60-minute public recital.
RESTRICTIONS: Requires senior status.

MUSC 403  Chamber Music Literature  3
Survey of chamber music literature from the 17th century to the present.
PREREQ: MUSC312, MUSC313
RESTRICTIONS: Requires permission of instructor. Offered in even numbered years, in spring semesters only.

MUSC 405  Symphony Literature  3
Historical and structural analysis of major symphonic works from the 18th century to the present.
PREREQ: MUSC312, MUSC313
RESTRICTIONS: Requires permission of instructor. Offered in odd numbered years, in spring semesters only.

MUSC 407  Contemporary Music Literature  3
Analysis of styles and techniques of contemporary composers beginning with compositions of the late 1950s.
PREREQ: MUSC313 or permission of instructor.
RESTRICTIONS: Offered in fall semester only.

MUSC 420  Private Study for Advanced Composition  3
Creative writing in vocal and instrumental media.
PREREQ: MUSC299
RESTRICTIONS: May be repeated for up to nine credit hours. Offered in fall and spring semesters.

MUSC 421  Special Projects in Music Theory  3
Theory majors do research and study under guidance of a faculty advisor on an approved topic for a formal paper to be presented at a public lecture.
PREREQ: MUSC485

MUSC 426  German Lieder  2
Literature survey of the standard vocal repertoire of the German tradition. Includes examples of the works of such composers as Schubert, Brahms, Schumann, Wolf and Strauss.
RESTRICTIONS: Open to juniors and seniors. Offered every third spring semester, in rotation with MUSC427 and MUSC428.

MUSC 427  French Art Song  2
A literature survey of the standard vocal repertoire of the French tradition. Includes examples of the works of such composers as Faure, Debussy, Duparc and Fauré.
RESTRICTIONS: Requires junior or senior status. Offered every third spring semester, in rotation with MUSC426 and MUSC428.

MUSC 428  Twentieth-Century Art Song  2
A literature survey of the standard vocal repertoire of the 20th Century. Includes examples of the works of such composers as Barber, Britten, Schonberg, Ives, Vaughan Williams and Rorem.
RESTRICTIONS: Requires junior or senior status. Offered every third spring semester, in rotation with MUSC426 and MUSC427.

MUSC 431  Orchestration  2
Advanced orchestral and band arranging; review of instrumental ranges and colors; scoring for small ensembles; special problems in scoring accompaniments. Final arrangement performed by a University Ensemble.
PREREQ: MUSC296
RESTRICTIONS: Enrollment by permission of instructor. Offered in spring semester only.

MUSC 441  Accompanying Chamber Music: Piano  1
Accompanying vocalists and instrumentalists and experiences with piano, chamber and large ensembles, and degree recitals.
PREREQ: MUSC241
RESTRICTIONS: Requires permission of instructor. Offered fall and spring semesters. May be repeated 1 time for credit.

MUSC 443  Chamber Music Performance  1
Survey of chamber music literature through performance. Emphasis is placed on the development of ensemble skills while exploring music from the Baroque Period through the present day. Open to both majors and non-majors and open to voice, string, piano, and wind players.
RESTRICTIONS: Requires permission of instructor.

MUSC 451  Private Study for Music Education VII  2
Continuing private study for senior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC352
RESTRICTIONS: For music education majors only. Offered fall and spring semesters.
MUSC 452 PRIVATE STUDY FOR MUSIC EDUCATION VIII 2
Optional continuing private study for senior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC451
RESTRICTIONS: For music education majors only. Offered fall and spring semesters

MUSC 453 PRIVATE STUDY FOR BACHELORS OF ARTS AND MINORS VII 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC354, permission of instructor
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts degree credit. Offered fall and spring semesters.

MUSC 454 PRIVATE STUDY FOR MUSIC BACHELORS OF ARTS AND MINORS VIII 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC352, permission of instructor
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts degree credit. Offered fall and spring semesters.

MUSC 457 PRIVATE STUDY FOR APPLIED MUSIC VII 4
Continuing private study for senior applied music majors, including preparation for Senior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC358
RESTRICTIONS: For applied music majors only

MUSC 458 PRIVATE STUDY FOR APPLIED MUSIC VIII 4
Continuing private study for senior applied music majors, including preparation for Senior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC457
RESTRICTIONS: For applied music majors only

MUSC 464 INTERNSHIP 1-3
Field experience with nonprofit performing arts organizations or commercial music businesses relevant to the student's area of interest
RESTRICTIONS: Open to music management studies majors and minors only

MUSC 466 INDEPENDENT STUDY 1-3

MUSC 480 VOCAL PEDAGOGY 3
Designed for those who plan to work with the singing voice. Includes vocal research, comparative pedagogy, observation of teaching and practical teaching experience.
RESTRICTIONS: Offered fall semester only

MUSC 481 PEDAGOGY AND LITERATURE 3
The study of teaching methods and literature (music scores, books, and other media). Shows teaching skills needed at the secondary level and lower
RESTRICTIONS: Requires permission of instructor

MUSC 484 RECORDING TECHNIQUES 3
Covers three parameters: history of recording and recording technology; recording techniques with hands-on experiences; and aesthetics of recording and its impact on music through the 20th and 21st centuries
PREREQ: MUSC095 or MUSC105
RESTRICTIONS: Enrollment by permission of instructor

MUSC 488 PRINCIPLES OF MUSIC INDUSTRY PRACTICE 3
Offers an understanding of the fundamental workings of the music industry. Examines theory/practice of core principles, focusing on provisions of copyright law, standard agreements, and professional organization influences. Emphasis on framework for interaction among writers, artists, performers, publishers, record companies, producers.
RESTRICTIONS: Enrollment by permission of instructor

MUSC 489 OPERA WORKSHOP 1-3
Dramatic and musical preparation of operatic roles through the production of a complete opera/operetta.
RESTRICTIONS: Admission by audition, with permission of private instructor, and preference given to vocal performance majors. Offered fall and spring semesters.

MUSC 561 NON-DEGREE PRIVATE STUDY 1-2
Continuing private study for all music majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC452, MUSC454, or MUSC458, and permission of instructor
RESTRICTIONS: Music majors only. May be repeated for credit

MUSC 600 MASTER'S PERFORMANCE IN CONDUCTING 2 PF
Reflects the culmination of student performances as a conductor with one or more large ensembles in the Department of Music.
PREREQ: MUSC662
RESTRICTIONS: For students in the Master of Music degree, Performance Concentration (Conducting).

MUSC 601 MASTER'S RECITAL 2 PF
A sixty-minute public recital
COREQ: MUSC663

MUSC 602 ADVANCED KEYBOARD LITERATURE 3
An historical survey of selected keyboard works from various style periods, including structural analysis and performance implications.
RESTRICTIONS: Requires permission of instructor.

MUSC 603 CHAMBER MUSIC LITERATURE 3
Survey of chamber music literature from the 17th century to the present
RESTRICTIONS: Requires permission of instructor. Offered in even numbered years, in spring semester only

MUSC 604 STRING QUARTET LITERATURE 3
A survey of music for the string quartet from Haydn through the present day
RESTRICTIONS: Requires permission of instructor.

MUSC 605 SYMPHONIC LITERATURE 3
Historical and structural analysis of major symphonic works from the 18th century to the present
RESTRICTIONS: Requires permission of instructor. Offered in odd numbered years, in spring semester only.

MUSC 606 WIND LITERATURE 3
History of the wind band and its music from the Renaissance to the present, with emphasis on the wind music from the 19th and 20th centuries for wind ensemble and concert band. Examines wind literature suitable for secondary school and college level performing groups.
RESTRICTIONS: Requires permission of instructor

MUSC 607 CONTEMPORARY MUSIC LITERATURE 3
Analysis of styles and techniques of contemporary composers beginning with compositions of the late 1950s.
RESTRICTIONS: Requires permission of instructor. Offered in fall semester only.

MUSC 608 VOCAL MUSIC LITERATURE 3
A survey of important literature for solo voice. Area of emphasis varies by year and includes German Lieder, French Art Song, and twentieth-century Art Song
RESTRICTIONS: Requires permission of instructor. May be repeated when topics vary

MUSC 609 CHORAL MUSIC LITERATURE I 3
Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1450. Particular emphasis on current research as related to the use of primary source material as applied to the modern edition.
RESTRICTIONS: Requires permission of instructor

MUSC 610 CHORAL MUSIC LITERATURE II 3
Survey of the development of major choral genres [e.g. mass, motet, requiem] from 1500 to the present. The evolution of musical style and structure is examined through analysis and discussion regarding performance practice.
RESTRICTIONS: Requires permission of instructor

MUSC 611 STUDIES IN MUSIC HISTORY 3
A survey of representative compositions from various periods of music history. Includes a study of the relationship of music to the sociocultural background of each epoch and discussions of performance practice problems. Topics of study may change with each time of offering.
RESTRICTIONS: Offered in spring semester only

MUSC 620 LARGE ENSEMBLE Participation as a performer in a large ensemble
RESTRICTIONS: Entry audition required

MUSC 621 CHAMBER ENSEMBLE Participation as a performer in a chamber ensemble
RESTRICTIONS: Entry audition required.

MUSC 622 MATERIALS AND METHODS OF RESEARCH 3
Examines the major materials used in research in the areas of music history, theory, performance and education, as well as the methods of conducting research in these fields.
RESTRICTIONS: Requires permission of instructor. Offered in fall semester only.
MUSC 631 / Advanced Arranging 3
Advanced arranging for chamber, choral, and orchestral ensembles, concert band and marching band percussion sections.
PREREQ: MUSC 296
RESTRICTIONS: Enrollment by permission of instructor.

MUSC 637 / Advanced Instrumental Conducting 3
Advanced conducting techniques for directors of instrumental performing groups.
RESTRICTIONS: Requires permission of instructor.

MUSC 638 / Large Ensemble Practicum 1
Participation in a large ensemble and seminar with ensemble director.
RESTRICTIONS: Requires permission of instructor.

MUSC 640 / History and Philosophy of Music Education 3
Topics include philosophical issues concerning the role of arts in education, intrinsic and extrinsic rationales for music in the schools, and arts advocacy at the local, state, and national levels. Also includes the history and philosophy of music education in the United States from the colonial period to the present.
RESTRICTIONS: Requires permission of instructor.

MUSC 643 / Advanced Chamber Music Performance 1
In-depth survey of chamber music literature through performance. Emphasis is placed on the development of advanced ensemble skills while exploring music from the Baroque Period through the present day. Open to both majors and non-majors and open to voice, string, piano, and wind players.

MUSC 661 / Advanced Private Study 3-4
Advanced instruction in voice, instrument, composition or conducting. The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument, conducting, or composition e.g., Advanced Private Study (Piano).
PREREQ: MUSC 661
RESTRICTIONS: Requires permission of instructor.

MUSC 666 / Advanced Private Study 3-4
Advanced instruction in voice, instrument, composition or conducting. The student adds to course title the branch of study elected: piano, organ, voice, orchestral instrument, composition or conducting e.g., Advanced Private Study (Piano).
PREREQ: MUSC 661
RESTRICTIONS: Requires permission of instructor.

MUSC 675 / General Music K-12 3
Learning strategies to develop listening, performing, creating and literacy skills in a general music curriculum. Recommended for directors of performing ensembles.
RESTRICTIONS: Requires permission of instructor.

MUSC 676 / Seminar in Music Education 3
Advanced topics in music education.
RESTRICTIONS: Requires permission of instructor.

MUSC 679 / Professional Improvement Project I 1
Development of a portfolio to include unit plans based on synthesis of content from prior courses.
RESTRICTIONS: Requires permission of instructor. Taken in sequence with MUSC 680 as an alternative to thesis option.

MUSC 680 / Professional Improvement Project II 3
Implementation of the portfolio developed in MUSC 679.
PREREQ: MUSC 679
RESTRICTIONS: Taken in sequence with MUSC 679 as an alternative to thesis option.

MUSC 681 / Pedagogy and Literature 3
The study of teaching methods and literature (music scores, books and other media). Shows teaching skills needed at the university level and lower.

MUSC 684 / Advanced Recording Techniques 3
Covers advanced aspects of the following parameters: history of recording and recording technology; recording techniques with hands-on experiences; and aesthetics of recording and its impact on music through the 20th and 21st centuries.
PREREQ: MUSC 095 or MUSC 105
RESTRICTIONS: Enrollment by permission of instructor.

MUSC 688 / Advanced Principles of Music Industry Practice 3
Offers an advanced understanding of the fundamental workings of the music industry. Emphasis on the advanced aspects of the theory/practice of core principles, with a focus on provisions of copyright law, standard agreements, professional organization influences, and the framework for interaction among writers, artists, performers, publishers, record companies, and producers.
RESTRICTIONS: Enrollment is by permission of instructor.

MUSC 695 / Advanced Analytical Techniques 3
Examination of structural, melodic, rhythmic, harmonic and textural aspects of selected music literature and their significance in artistic performance.
RESTRICTIONS: Requires satisfactory score on music theory graduate placement exam. Offered in fall semester only.

MUSC 697 / Advanced Jazz Harmony 3
Study of advanced aspects of melody, harmony, texture, dynamics, rhythm and form in selected jazz and American popular literature; development of advanced aural-perceptual and compositional skills related to jazz and American popular music.
RESTRICTIONS: Enrollment by permission of instructor.

MUSC 869 / Master's Thesis 1-6

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**NUTRITION AND DIETETICS**

NTDT 103 / Introduction to Nutrition Professions 1 PF
Career opportunities in dietetics and nutrition. Provides information about undergraduate programs and the competencies required of dietitians and nutritional scientists. Introduces opportunities for undergraduate research.

NTDT 168 / Freshman Special Topics 1-6
Freshman level independent study.

NTDT 200 / Nutrition Concepts 3
Functions and sources of nutrients, dietary adequacy, energy balance and metabolism with emphasis on health promotion. Includes weight control, evaluation of popular diets, vegetarianism, eating disorders, alcohol, other current issues and concerns in nutrition.

NTDT 201 / Food Concepts 3
Food selection and preparation as related to the chemical and physical properties of food. Includes composition and structure of foods, functions of ingredients and methods to achieve desirable sensory and nutritional attributes of foods.
RESTRICTIONS: Open to APN, DIET, NS, HS and IST majors and minors only.

NTDT 222 / Nutrition Controversies 1
Explores topical issues in nutrition via discussion format.
COREQ: NTDT 200

NTDT 230 / Introduction to the Nutrition Care Process 3
Introduction to skills and competencies of the clinical dietitian based on the Nutrition Care Process (assessment, diagnosis, intervention, monitoring, and evaluation). Evidence-based practice is promoted with emphasis on state-of-the-art science and state-of-the-art of dietetics practice.
PREREQ: NTDT 200

NTDT 255 / Multicultural Food Habits 3
Food habits of diverse cultural groups. Determinants of traditional and current food habits, historical and cultural context. Emphasis on ethnic population groups in the United States. Contribution of selected dietary patterns to knowledge of health and disease prevention. Impact of migration to different cultural settings.

NTDT 256 / Multicultural Foods Laboratory 1
Sampling of foods of diverse cultural groups utilizing demonstrations by restauranteurs and individuals as well as class preparation. Field trips to markets and ethnic food stores.
COREQ: NTDT 255

NTDT 268 / Sophomore Special Topics 1-6
Sophomore level independent study.

NTDT 305 / Nutrition in the Lifespan 3
Nutrition and health during the different stages of life: pregnancy, lactation, infancy, preschool years, middle childhood, adolescence, adulthood and later maturity.
PREREQ: NTDT 200 and a course in biology.
NTDT 310  **NUTRITION AND ACTIVITY**  3
Energy and nutrient needs for activity with an emphasis on particular physical and athletic activities; common myths and fallacies concerning diet and athletic performance; and appropriate dietary approaches for specific activities and active people.
PREREQ: NTDT200 and a physiologist course.

NTDT 321  **QUANTITY FOOD PRODUCTION AND SERVICE**  3
Principles of quantity food production and delivery systems; menu planning and purchasing design; safety, sanitation, and technical operations in a food service system.
PREREQ: NTDT200 and NTDT201.

NTDT 322  **MANAGEMENT OF FOOD AND NUTRITION SERVICES**  3
Organization and administration of non-profit and entrepreneurial services. Functions and responsibilities related to these products including planning, marketing, total quality and human resource management, and food and labor cost accounting.
PREREQ: NTDT200 and NTDT201.

NTDT 326  **ONSITE FOOD PRODUCTION**  3
Laboratory experience in quantity food production and delivery with emphasis on equipment, production methods, quality standards and controls and environmental issues. Development of food production design considering material flow, functional areas and utility requirements. Food safety certification.
COREQ: NTDT321.

NTDT 330  **NUTRITION COUNSELING**  3
Theories, skills and techniques of nutrition interviewing and counselling applied to changing food behaviors. 
PREREQ: NTDT200, NTDT250.

NTDT 335  **NUTRITION AND OLDER ADULTS**  3
Discussion of the physiology of aging on fundamental nutrition processes, food and nutrient requirements and intakes, assessment of nutritional status, and nutrition related problems of older adults.
PREREQ: NTDT200 and BISC106 or BISC276.

NTDT 368  **JUNIOR SPECIAL TOPICS**  1–6
Junior level independent study.

NTDT 400  **MACRONUTRIENTS**  3
Metabolism of carbohydrates, proteins and fats in human nutrition, interdependence and relation to energy metabolism/balance, scientific bases of macronutrient requirement during the life cycle.
PREREQ: NTDT200, CHEM214 and CHEM216.

NTDT 401  **MICRONUTRIENTS**  3
Mechanisms and interactions of vitamins and minerals in cellular metabolism, scientific bases of nutrient requirements during the life cycle.
PREREQ: NTDT400.

NTDT 403  **DIETETICS SEMINAR**  1 PF
Provides direction for career decisions, including self-assessment, resume development, and interview preparation. Focuses on the post-baccalaureate career pathways of employment, graduate study, and the supervised practice experience. Explores registration, specialty certification and licensure for dietitians.
RESTRICTIONS: Open only to senior dietetics majors.

NTDT 410  **OVERWEIGHT/OBESITY PREVENTION AND MANAGEMENT**  3
PREREQ: NTDT200.

NTDT 420  **MATERNAL AND INFANT NUTRITION**  3
Maternal physiological adjustments in pregnancy and their relationship to nutritional needs; effect of maternal nutrition on fetal growth and development; physiology of lactation and maternal nutrient needs; and neonatal nutritional needs and current infant feeding practices.
PREREQ: NTDT400 and BISC276.

NTDT 421  **NUTRITIONAL ASSESSMENT METHODS**  3
Nutritional screening and assessment methods and techniques including evaluation of dietary intake, anthropometric measurements, biochemical tests and clinical assessment. Overview of the methodologies involved in nutrition research. 
PREREQ: NTDT400 and a course in statistics.

NTDT 430  **NUTRITION CLINIC PRACTICUM**  1–3
Experience in ongoing activities of the University of Delaware Nutrition Clinic including client counseling, group presentations, nutrition education materials development and research activities.
PREREQ: NTDT330.
RESTRICTIONS: Requires permission of instructor.

NTDT 435  **PEER NUTRITION MENTORING**  3
Preparation of upper division students to become peer mentors for an introductory nutrition course. Internet discussion forums used to increase interaction in a large classroom setting. Offers pre-professional practice opportunities for nutrition majors. 
PREREQ: NTDT400.

NTDT 445  **TEACHING METHODS: NUTRITION/FOODS**  3
Needs assessment; writing instructional objectives; selecting appropriate methods, materials and resources for audiences varying in age, literacy and ethnicity; planning, implementing and evaluating education programs related to food and nutrition.
PREREQ: NTDT200.

NTDT 450  **MEDICAL NUTRITION THERAPY I**  3
PREREQ: NTDT250, NTDT400, BISC276.

NTDT 451  **MEDICAL NUTRITION THERAPY II**  3
Continuation of Medical Nutrition Therapy I. Pathophysiology, diet and disease relationships and diet therapy for diseases: liver, renal, cancer, AIDS, inborn errors of metabolism. Critical care nutrition, nutritional management of physiological stress and trauma.
PREREQ: NTDT250, NTDT400, BISC276.

NTDT 452  **TOPICS IN NUTRITION AND DIETETICS**  1–3
In-depth analysis of a specific topic in an area of nutrition and dietetics. 
RESTRICTIONS: Junior-level NTDT course(s) relating to the specific topic required.

NTDT 460  **COMMUNITY NUTRITION**  3
Nutritional care as a part of health maintenance and health care delivery; the relationship of community resources, structure and dynamics to an individual's ability to be well fed. Nutritional needs and programs. Means of affecting change in nutrition knowledge and practice.
PREREQ: NTDT400 and NTDT321.

NTDT 464  **COMMUNITY NUTRITION FIELD EXPERIENCE**  2
Direct client contact through delivery of nutritional services in community health maintenance and health care delivery facilities. First hand experience with the nutritional management of clients in a community nutrition program.
PREREQ: NTDT332 
COREQ: NTDT460.

NTDT 468  **SENIOR SPECIAL TOPICS**  1–6
Senior level independent study.

NTDT 475  **TRANSCULTURAL FOODS AND CUISINE**  3–5
Travel study of transcultural food habits: attitudes, beliefs, customs and taboos. Visits to major food industries and health organizations and interaction with indigenous population.
PREREQ: NTDT200.

NTDT 550  **DIETETICS PRACTICUM I**  4 PF
Introduces supervised practice experiences for incorporation and application of skills, knowledge, and attitudes, focusing on entry-level competence with special emphasis on current dietetic issues facing the health professional in public health nutrition.
COREQ: NTDT1650
RESTRICTIONS: Open to dietetic internship students only.

NTDT 551  **DIETETICS PRACTICUM II**  4 PF
Continued supervised practice experiences for incorporation and application of skills, knowledge, and attitudes, focusing on entry-level competence with special emphasis on current dietetic issues facing the health professional in public health nutrition.
PREREQ: NTDT550 
COREQ: NTDT651
RESTRICTIONS: Open to dietetic internship students only.

NTDT 611  **ADVANCED NUTRITION**  3
Metabolism and its relation to human nutrition; current literature; methods and techniques of nutrition research. 
PREREQ: NTDT400 or NTDT610.

NTDT 615  **ADVANCED NUTRITION AND PHYSICAL ACTIVITY**  3
Critical analysis of current research on effects of nutrition, food and diet on physical activity and optimal athletic performance. Develops specific topics and interests through independent projects.
PREREQ: Undergraduate nutrition and physiology courses.

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NTDT 620  MATERNAL AND INFANT NUTRITION  3
Maternal physiological adjustments in pregnancy and their relationship to nutritional needs; effect of maternal nutrition on fetal growth and development; physiology of lactation and maternal nutrient needs; neonatal nutritional needs and current infant feeding practices.
PREREQ: NTDT400 and BISC106 or BISC406

NTDT 621  NUTRITION RESEARCH METHODS  2
Discussion and experience with selected methods and techniques in nutrition research.
PREREQ: Upper-division course work in nutrition, biochemistry and physiology

NTDT 624  MONOGASTRIC NUTRITION  3
See ANSC624 for course description.

NTDT 630  TRACE MINERALS AND VITAMINS  3
Recent advances in knowledge of the nutritional significance of trace minerals and vitamins; their physiological function(s); factors affecting needs and utilization; assessment of requirements; occurrence in food supply; and current issues and concerns. Primary focus on human nutrition with comparative aspects in other living systems utilized to illustrate significant similarities and/or differences. May be cross-listed with ANSC630.
PREREQ: Juniolevel course work in human or animal nutrition, biochemistry or biological sciences.

NTDT 640  NUTRITION AND AGING  3
Addresses topics related to the effects of aging on fundamental nutrition processes, food and nutrient requirements, nutrition screening and assessment of nutritional status, nutrition intervention and food assistance programs and nutrition related disorders of older adults.
PREREQ: NTDT310 or NTDT400 or NTDT401.

NTDT 645  TEACHING METHODS/NUTRITION/FOODS  3
Needs assessment; writing instructional objectives; selecting appropriate methods, materials and resources for audiences varying in age, literacy and ethnicity; planning, implementing and evaluating education programs related to food and nutrition.
PREREQ: NTDT200.

NTDT 650  CURRENT PERSPECTIVES IN DIETETICS I  2
Introduces exploration of roles and responsibilities of today's dietitian in food service management, clinical and community dietetics. Emphasis on concepts relevant to evolving therapies and technologies in the profession and issues influencing ethical, legal and professional responsibilities of dietitians.

NTDT 651  CURRENT PERSPECTIVES IN DIETETICS II  2
Continued exploration of roles and responsibilities of today’s dietitian in clinical, community and food service management dietetics. Emphasis on concepts relevant to evolving therapies and technologies in the profession and issues that influence ethical, legal and professional responsibilities of dietitians.

NTDT 652  TOPICS IN NUTRITION AND DIETETICS  1-3
Analysis of a specific topic in an area of nutrition and dietetics.
RESTRICTIONS: Requires permission of instructor.

NTDT 654  ADVANCED RUMINANT NUTRITION  3
See ANSC654 for course description.

NTDT 660  COMMUNITY NUTRITION  3
Nutritional care as part of health maintenance and health care delivery; the relationship of community resources, structure and dynamics to an individual's ability to be well fed. Nutritional needs and programs. Nutrition program planning and evaluation; community assessment techniques.
RESTRICTIONS: Advanced nutrition course required

NTDT 665  SEMINAR  1-3 PF

NTDT 668  RESEARCH  1-6

NTDT 669  FIELD PROJECT OR THEORETICAL PAPER  1-6
Development, preparation and defense of written report of field project observations or theoretical analysis.
RESTRICTIONS: Requires permission of instructor

NTDT 675  TRANSCULTURAL FOOD HABITS  5
Travel study of transcultural food habits: attitudes, beliefs, customs and taboos. Visits to major food industries and health organizations and interaction with indigenous population.
PREREQ: NTDT200
RESTRICTIONS: Only three credit hours may count toward graduation for majors.

NTDT 868  RESEARCH  1-6

NTDT 869  MASTER'S THESIS  1-6

NURSING

NURS 100  NEW STUDENT CONNECTIONS  1
Provides first semester students in the College of Health Sciences opportunities to explore and become familiar with the college and university. Students acquire information on campus resources and gain practical skills helpful for a successful transition to college.
RESTRICTIONS: Open to nursing majors only.

NURS 101  HUMAN ANATOMY  2
Introduction to the study of human anatomy which provides a foundation for the future study of human physiology and other related courses. Includes a clinically relevant, fundamental overview of the human body using a "systems" approach.
RESTRICTIONS: Open to nursing and health studies majors only.

NURS 110  NURSING CONNECTIONS  1
Introduction to the profession of nursing and basic clinical nursing skills. Includes the roles of nursing, historical development and nursing philosophy.
RESTRICTIONS: Open to nursing majors only.

NURS 200  CLINICAL DECISION MAKING  2
Introduces and explores nurses' decision making processes including the nursing process. Builds upon basic clinical skills with psychomotor, cognitive, and affective skills used by nurses.
PREREQ: NURS110, ENG110.
RESTRICTIONS: Open to nursing majors only.

NURS 220  CONCEPTS OF NURSING PRACTICE  3
Introduction to the nursing profession which includes psychomotor, cognitive and affective skills integral to basic nursing practice. The nursing process, professional ethics, and basic clinical skills are covered.
PREREQ: ENGL110
COREQ: PSYC100
RESTRICTIONS: Open to accelerated nursing majors only.

NURS 222  PHARMACOLOGY  3
Focuses on the therapeutic and adverse biological, psychological and social reactions to pharmaceutical agents. Drug use and medication abuse, client teaching, lab data and current research are discussed. Nursing responsibilities and clinical applications are emphasized.
PREREQ: NURS220
COREQ: NURS230, NURS240
RESTRICTIONS: Open to nursing majors only.

NURS 230  FOUNDATIONS OF NURSING  2
Examines the health continuum with an emphasis on wellness, health promotion across the lifespan, the aging process, and an introduction to community-based nursing. Clients are discussed as individuals, members of families, and as parts of cultural and global communities.
PREREQ: BISC207, CHEM105, and a course in anatomy.
COREQ: NURS220
RESTRICTIONS: Open to accelerated nursing majors only.

NURS 231  HEALTH PROMOTION ACROSS THE LIFESPAN  2
Explores the continuum of healthcare with a focus on prevention, wellness initiatives and health promotion across the lifespan. Emphasizes the nurse's teaching role.
Examines types of health promotion for individuals, families and communities
PREREQ: NURS110
RESTRICTIONS: Open to nursing majors only.

NURS 236  CARE OF VULNERABLE POPULATIONS  2
Focuses on population-based healthcare. Examines community level nursing care. Explores vulnerability as it relates to pediatric, older adult, rural and disadvantaged, and culturally diverse populations within the American healthcare system.
PREREQ: NURS110
RESTRICTIONS: Open to nursing majors only.

NURS 241  SCIENTIFIC BASIS OF NURSING  3
Examines pathophysiological concepts as a scientific basis of disease processes. Focuses on major body systems, including immune, endocrine, neurological and psychological. Emphasizes concepts of cancer, pain and infection.
PREREQ: BISC207, CHEM105, CHEM106, NURS101, NURS110
COREQ: BISC276 or BISC300
RESTRICTIONS: Open to nursing majors only.

NURS 242  SCIENTIFIC BASIS OF NURSING  3
Examines pathophysiological concepts as a scientific basis of disease processes. Focuses on major body systems, including cardiovascular, respiratory, gastrointestinal and renal. Emphasizes concepts of fluids and electrolytes.
PREREQ: BISC207, CHEM105, CHEM106, NURS101, NURS110
COREQ: BISC276 or BISC300
RESTRICTIONS: Open to nursing majors only.
NURS 250 Health Assessment Across the Lifespan 2
Introduces and develops clinical skills of physical health assessment across the lifespan. Field experiences develop physical assessment skills.
PREREQ: NURS110, NURS200
COREQ: BISC 276, BISC300, NTD1200, IFST201
RESTRICTIONS: Open to nursing majors only

NURS 312 Pathophysiology 3-4
Focuses on biological processes leading to alterations of body structure and function. Emphasis on identification of etiology and pathogenesis of selected diseases.
PREREQ: BISC276, BISC300, IFST201, NTD1200, PSYC100 and STAT200.
RESTRICTIONS: Open to nursing majors only. Nursing majors must take three credits. BRN majors must take four credits

NURS 335 Baccalaureate for the Registered Nurse Orientation 1
Provides an orientation to the on-line BRN major including a hands-on technology component. Includes initial preparation for the BRN Practicum. Emphasizes resources essential for successful program completion.
RESTRICTIONS: Must be taken prior to any other BRN nursing course. Open to BRN majors only

NURS 340 Current Perspectives in Nursing 2
Introduces nursing theory and conceptual frameworks for practice within a pluralistic society. Provides an overview of principles of nursing education and practice at the baccalaureate level. Focuses on healthcare needs within diverse practice settings, emphasizing emerging legal and ethical responsibilities, economic and sociocultural influences.
RESTRICTIONS: Admission to BRN program

NURS 342 Nursing Informatics 2
Addresses the current utilization of evolving technologies in nursing/client education, practice, administration and research.
RESTRICTIONS: Admission to BRN program

NURS 343 Transition to Baccalaureate Nursing 1
Addresses issues related to the socialization and transition to baccalaureate nursing education and practice. Complements content of NURS340 and NURS342. Incorporates the practical application of evolving technologies with emphasis on nursing/client education. Introduces University and BRN program resources.
PREREQ: NURS340 and NURS342

NURS 344 Wellness and Health Assessment 2
Explores selected concepts, theories and skills utilized in health promotion and disease prevention of individuals from socioculturally diverse populations within the context of family, community and healthcare system. Includes key elements of a biopsychosocialcultural health history and health assessment of individuals across the life course.
PREREQ: NURS343

NURS 345 Conceptual Foundations for Nursing Practice 3
Introduces conceptual foundations for practice within a pluralistic society. Provides an overview of nursing education, practice, research, informatics and evolving technologies. Focuses on healthcare needs within diverse practice settings, emphasizing emerging legal and ethical responsibilities, and economic and sociocultural influences.
PREREQ: NURS335

NURS 350 Wellness and Health Assessment 3
Explores selected concepts, theories and skills utilized in health promotion and disease prevention of individuals from socioculturally diverse populations within the context of family, community and healthcare system. Key elements include a health history, physical, and psychosocial assessment.
PREREQ: NURS335, NURS345
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.

NURS 352 Adult Health Nursing 3
Examines selected concepts and theories related to restoring and maintaining optimal health in adult populations. Focuses on major body systems, including immune, endocrine, renal and gastrointestinal. Also discusses concepts of cancer. Selected laboratory and field experiences are included to enhance concepts.
PREREQ: BISC276, BISC300; all required 200 level nursing courses.
RESTRICTIONS: Open to nursing majors only

NURS 354 Psychosocial Nursing 3
Presents and examines selected concepts and theories related to restoring and maintaining optimal health of patients experiencing psychopathology. Selected laboratory and field experiences are included to enhance concepts.
PREREQ: All 200 level required nursing courses.
RESTRICTIONS: Open to nursing majors only

NURS 356 Care of Children and Families 3
Presents selected concepts and theories related to the nursing care of infants, children and adolescents and their families. Selected laboratory and field experiences are included to enhance concepts.
PREREQ: All 200 level required nursing courses.
RESTRICTIONS: Open to nursing majors only

NURS 358 Women's Health Nursing 3
Presents selected concepts and theories related to the nursing care of the childbearing family and major women's health issues. Selected laboratory and field experiences are included to enhance concepts.
PREREQ: All 200 level required nursing courses.
RESTRICTIONS: Open to nursing majors only

NURS 362 Research Concepts in Healthcare 3
Application of the research process and the research utilization process to healthcare practice.
PREREQ: NURS200, STAT200
RESTRICTIONS: Open to nursing and health studies majors only

NURS 366 Independent Study 1-6

NURS 372 Adult Health Nursing 3
Examines selected concepts and theories related to restoring and maintaining optimal health in adult populations. Focuses on major body systems, including cardiovascular, respiratory, and neurological.
PREREQ: All 200 level required nursing courses.
RESTRICTIONS: Open to nursing majors only

NURS 380 Clinical Work Experiences 1-2 PF
Students receive credit for approved healthcare-related work/volunteer experience. Students must work/volunteer in an appropriate healthcare-related position and credit will be given based on hours worked.
PREREQ: NURS200
RESTRICTIONS: Open to nursing majors only

NURS 390 Multicultural Topics in Healthcare Delivery 1-6
A consideration of selected issues and problems of nursing practice within the healthcare delivery system. Exploration of some topics may include a laboratory or clinical component. Variable topics.
RESTRICTIONS: Open to nursing and health studies majors, or by permission of professor. May be repeated for up to six credit hours.

NURS 411 Topics in Healthcare Delivery 1-6
A consideration of selected issues and problems of nursing practice within the global healthcare delivery system. Exploration of some topics may include a laboratory or clinical component. Variable topics.
COREQ: NURS362 or permission of instructor.
RESTRICTIONS: Open to nursing and health studies majors, or by permission of professor. May be repeated for up to six credit hours.

NURS 435 Leadership and Management in Health Organizations 3
Introduces the principles of leadership and management and their application in health systems where nursing care is delivered. Focuses on the roles of nurse leaders and managers across practice settings.
PREREQ: All 300 level BRN nursing courses.
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.

NURS 442 Community Health Nursing 3
Focuses on conceptual foundations for community health nursing practice with the community, family and individual as clients. Diversity in nursing roles and practice is related to community health promotion and community health problems.
PREREQ: All 300 level BRN nursing courses.

NURS 443 BRN Role Practicum 3
A preceptored clinical experience focused upon the integration of concepts learned in baccalaureate nursing education.
PREREQ: NURS442
RESTRICTIONS: NURS445 and NURS456 required as prerequisites or corequisites

NURS 446 Leadership and Organizational Behavior 2
Introduces organizational theory and structure, nursing care delivery systems and components of leadership. Focuses on the role of the nurse leader in organizing, teaching, decision making, evaluating, planning change and managing conflict.
PREREQ: NURS441
## NURS 450  SYNTHESES OF PROFESSIONAL NURSING PRACTICE 1

Provides opportunities to bring key aspects of professional nursing practice together utilizing a systems framework. Includes student presentation of projects related to NUR544.

**PREREQ:** All other courses in BRN program.

**RESTRICTIONS:** Open to BRN majors only. Course sequence alteration requires permission of instructor.

## NURS 452  ADULT NURSING CARE II 3

Presents selected concepts and theories for the interdisciplinary management of adults with critical and/or complex healthcare problems. PREREQ: NURS250, NURS252, NURS253, NURS254, and NURS255.

**COREQ:** NURS453.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 453  CLINICAL APPLICATIONS ADULT HEALTH NURSING I 3 PF

Clinical application of science and nursing theories of care for adult clients in hospitals.

**PREREQ:** All 300-level required nursing courses.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 454  NURSING OF POPULATIONS 2

Presents selected concepts (community health promotion, epidemiology, coalition building, healthcare policy) and theories related to the nursing care of populations across the lifespan.

**PREREQ:** NURS352, NURS353, NURS354, NURS355, NURS356, NURS357, NURS358, NURS359, and NURS362.

**COREQ:** NURS445.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 455  CLINICAL APPLICATIONS: NURSING OF POPULATIONS 4

Application experiences in the community and laboratory which reinforce information presented in NURS454.

**PREREQ:** NURS352, NURS353, NURS354, NURS355, NURS356, NURS357, NURS358, NURS359, and NURS362.

**COREQ:** NURS445.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 457  CLINICAL APPLICATIONS: MATERNAL CHILD NURSING 3 PF

Clinical application of science and nursing theories of care for infants, children, adolescents and childbearing families.

**PREREQ:** All 300-level required nursing courses.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 459  CLINICAL APPLICATIONS: PSYCHOSOCIAL NURSING 3 PF

Clinical application of science and nursing theories of care for clients with acute and chronic psychiatric healthcare needs.

**PREREQ:** All 300-level required nursing courses.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 460  CLINICAL INTEGRATION SEMINAR I 2

Using a seminar format, students discuss major issues identified in clinical nursing care. Assists students in integrating scientific and theoretical knowledge into clinical practice. Focuses on legal and ethical issues, nursing roles, leadership, and nursing licensure issues that arise from clinical experiences.

**PREREQ:** All 300-level required nursing courses.

**COREQ:** NURS453, NURS457, NURS459.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 466  INDEPENDENT STUDY 1-6

NURS 473 Clinical Applications: Adult Health Nursing II 3 PF

Advanced clinical application of science and nursing theories in acute care health settings. Builds upon clinical practice skills of NURS453.

**PREREQ:** NURS453.

**COREQ:** NURS477, NURS478, and NURS480.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 474  PROFESSIONAL PRACTICE IN HEALTHCARE 2

Explores professional issues related to the current and future roles of healthcare professionals and serves as a capstone course.

**PREREQ:** NURS452, NURS453, NURS454, and NURS455.

**COREQ:** NURS475.

**RESTRICTIONS:** Open to healthcare majors only.

## NURS 475  SENIOR PRECEPTORSHIP 6

Comprehensive application of concepts and skills learned throughout the nursing curriculum which facilitate the transition to the professional role of the nurse.

**PREREQ:** NURS452, NURS453, NURS454, and NURS455.

**COREQ:** NURS474.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 477  CLINICAL APPLICATIONS: CARE OF POPULATIONS 3 PF

Clinical application of science and nursing theories in community health settings. Local, national, and global issues are addressed.

**PREREQ:** NURS453, NURS457, NURS459, and NURS460.

**COREQ:** NURS479, NURS480.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 479  CLINICAL PRECEPTORSHIP 3 PF

Clinical application of science and nursing theories in student-selected clinical settings. Provides a transition from student-faculty relationships to mentor-new graduate relationships. Students are mentored by a nurse preceptor.

**PREREQ:** NURS453, NURS457, NURS459. For accelerated students, NURS473 must precede NURS479.

**COREQ:** NURS473, NURS477, NURS479.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 480  CLINICAL INTEGRATION SEMINAR II 2

Discussion of major issues identified in clinical nursing care. Assists students in integrating scientific and theoretical knowledge into clinical practice. Focuses on legal and ethical issues, nursing roles, leadership, and nursing licensure issues that arise from clinical experiences. Provides a transition to new graduate nurse experiences.

**PREREQ:** NURS460.

**COREQ:** NURS473, NURS477, NURS479.

**RESTRICTIONS:** Open to nursing majors only.

## NURS 604  ADVANCED PRACTICE ROLES FOR HEALTHCARE PROVIDERS 3

Focuses on roles and issues affecting healthcare providers engaged in advanced practice. Roles are analyzed in relation to current issues and concepts of advanced practice.

May be cross-listed with HSAD604.

**RESTRICTIONS:** Permission required from department.

## NURS 609  NURSING SCIENCE: THEORY AND RESEARCH 4

Examines the science of nursing from theoretical and research perspectives and emphasizes theory as the foundation for research and practice.

**RESTRICTIONS:** Open to majors only. Permission required from department. First clinical course and EDUC653 required as prerequisites or corequisites.

## NURS 610  CROSSCULTURAL HEALTHCARE 3

An in-depth study of cultural diversity, delineating ethnocultural congruent healthcare practices in a pluralistic society. Assessment, planning and interventions for health promotion, illness and disease prevention, health restoration and health policy legislation are explored.

**RESTRICTIONS:** Open to only graduate students or by permission of instructor.

## NURS 612  NURSING INFORMATICS 3

Addresses the current utilization of evolving technologies in nursing/client education, practice, administration and research.

**RESTRICTIONS:** BSN or bachelor's degree in another discipline, or by permission of instructor.

## NURS 613  DEATH EDUCATION 3

Focuses on the field of death education, its relevance to everyday life and most specifically to the professional practice of practitioners providing support to the dying and bereaved.

**RESTRICTIONS:** Admission to BRN major or BSN degree or bachelor's degree in another discipline.

## NURS 616  PRIMARY CARE IN COMMUNITY HEALTH 3

Focuses on community-based primary care issues in relation to the individual, family, and community health. Clinical component includes health promotion and disease prevention activities.

**RESTRICTIONS:** Open to majors only. Permission required from department. NURS620 required as either a prerequisite or corequisite.

## NURS 617  PRECEPTORSHIP I 3

Focuses on clinical topics in primary care relevant to each practitioner concentration.

**PREREQ:** All required clinical courses except NURS627.

**RESTRICTIONS:** Open to nursing majors only. Permission of department required.

## NURS 619  FINANCIAL MANAGEMENT IN HEALTH SERVICES ORGANIZATIONS 3

Provides the basic principles and concepts of effective management of budgets for healthcare units. Includes analysis of the environment and departmental organization and their impact on healthcare practices in national, state, and local settings. Advanced knowledge and research perspectives and interventions for health promotion, illness, and disease prevention, health restoration and health policy legislation are explored.

**RESTRICTIONS:** Open to only graduate students or by permission of instructor.

## NURS 620  ADVANCED HEALTH ASSESSMENT 3

Assists graduate students in acquiring advanced knowledge and proficiency in performing health assessments. Includes eliciting a complete health history and performing a comprehensive examination.

**RESTRICTIONS:** Permission of department required.
### NURS 621 Advanced Pathophysiology 3

- Presents the pathogenesis of common conditions affecting children and adults as a basis for clinical emphasis.
- **RESTRICTIONS:** Permission of department required.

### NURS 622 Advanced Pharmacology 3

- Applies principles of pharmacology to the therapeutic management of the client.
- Emphasizes prescribing, monitoring drug regimens, identifying adverse reactions, and anticipating changes inherent in self medication.
- **RESTRICTIONS:** Permission of department required.

### NURS 623 Management of Women's Healthcare 3

- Focused on gynecological and reproductive primary healthcare. Emphasizes management of gynecologic health needs and the normal reproductive cycle.
- **RESTRICTIONS:** NURS604 and NURS622 are required as either corequisites or prerequisites.

### NURS 624 Management of Children's Health 3

- Focuses on delivery of primary healthcare to children and adolescents.
- Emphasizes physical and developmental variations and management of acute and episodic illness.
- **RESTRICTIONS:** NURS604 and NURS622 required as either corequisites or prerequisites.

### NURS 625 Management of Adult Episodic Health Needs and Problems 3

- Focused on delivery of primary care to adults and the elderly with acute episodic health problems.
- Emphasizes the clinical decision-making process necessary to serve as a foundation for planning primary healthcare services.
- **PREREQ:** NURS620 and NURS621.
- **RESTRICTIONS:** NURS604 and NURS622 required as prerequisites or corequisites.

### NURS 626 Management of Adult Chronic Health Needs and Problems 3

- Focuses on delivery of primary care to adults and the elderly with chronic health problems.
- Emphasizes management of ongoing needs.
- **PREREQ:** NURS620 and NURS621.
- **RESTRICTIONS:** NURS604 and NURS622 required as prerequisites or corequisites.

### NURS 627 Preceptorship II 3

- Emphasizes clinical decision making in an interdisciplinary environment with the nurse practitioner as the principal provider of primary care.
- **RESTRICTIONS:** NURS604 and NURS622 required as prerequisites or corequisites.

### NURS 628 Nurse Practitioner Seminar 1

- Emphasizes the role of the nurse practitioner in the current health care system.
- Issues such as marketing, practice acts, reimbursement, and prescriptive privileges are discussed.
- **PREREQ:** All required courses except NURS627.

### NURS 629 Advanced Management of Women's Healthcare 3

- Focuses on the delivery of primary care to women with acute and chronic obstetric and gynecologic problems.
- **PREREQ:** NURS623.

### NURS 630 Advanced Management of Children and Adolescent Healthcare 3

- Focuses on the delivery of primary healthcare to specific populations.
- Emphasizes special problems of the neonate and high risk children and adolescents.
- **PREREQ:** NURS624.

### NURS 635 Health Administration Theories 3

- Theories of administration, organization, and management, their interaction with other health discipline theories and their influence on management of healthcare agencies. Includes the interaction of theories with attainment of institutional goals.
- May be cross-listed with HSA635.
- **RESTRICTIONS:** NURS604 required as prerequisite or corequisite.

### NURS 636 Adult Health I 4

- Provides the conceptual foundation and practical knowledge base needed to develop the essential characteristics of the clinical nurse specialist in adult health.
- Core content is characterized around three spheres of influence: patient, families, and communities; nursing and healthcare personnel; and organizations and networks; with a primary focus on patients, families and communities. Areas of emphasis include assessment skills, therapeutic interventions, education, evidence-based practice and issues and trends in healthcare.
- **COREQ:** NURS604; NURS621.
- **RESTRICTIONS:** Open to clinical nurse specialist students only.

### NURS 637 Health Planning Strategies 3

- Analyzes organizational systems and roles of managers and administrators.
- Students identify organizational needs, formulate goals and objectives appropriate to healthcare agencies and identify strategies appropriate to accomplishing goals with ethical constraints of healthcare.
- May be cross-listed with HSAD637.
- **RESTRICTIONS:** NURS604 required as prerequisite or corequisite.

### NURS 638 Health Services Evaluation 3

- Emphasizes the role of managers and administrators in personnel development, promotion of research in clinical settings and development and implementation of quality improvement initiatives and their implications for healthcare.
- May be cross-listed with HSAD638.
- **RESTRICTIONS:** NURS604 required as prerequisite or corequisite.

### NURS 646 Adult Health II 4

- Provides opportunities to develop advanced skills inherent to the clinical nurse specialist role as determined by the National Association of Clinical Nurse Specialists.
- Content organized around the three spheres of influence with emphasis on nursing and healthcare personnel and builds upon CNS content in previous courses. Areas of emphasis include leadership, collaboration, citizenship, cost-effective care, innovations in practice, and mentorship.
- **PREREQ:** NURS636.
- **RESTRICTIONS:** Open to graduate clinical nurse specialist students only.

### NURS 654 Nursing of Children I 4

- Explores the scientific basis for the routine healthcare guidance required by children and their families.
- Focuses primarily on the acutely ill child.
- **RESTRICTIONS:** NURS604 and NURS621 required as prerequisites or corequisites.

### NURS 655 Nursing of Children II 4

- Explores the biopsychosocial needs of children with chronic conditions and their families.
- Emphasizes the interventions of the advanced practice nurse to assist these children to attain, maintain or regain health.
- **PREREQ:** NURS654.
- **RESTRICTIONS:** Open to matriculated graduate nursing students only.

### NURS 664 Nursing Practicum 1-3

- In conjunction with the faculty advisor and based on the student's individualized long range goals, the student selects a preceptor and healthcare setting in which to apply didactic content in real life settings. Requires 125 hours of on-site experience, which can be taken in one semester or divided over three semesters.
- **RESTRICTIONS:** NURS635, NURS637, or NURS638 is required as a corequisite or prerequisite.

### NURS 671 Psychiatric Mental Health Nursing I 4

- Emphasizes theory and research related to assessment, diagnosis, clinical management and psychopharmacological intervention in mental illness.
- Didactic and clinical components allow for the development of subspecialization.
- **PREREQ:** Graduate psychopathology course.
- **RESTRICTIONS:** Open to matriculated students only.

### NURS 672 Psychiatric Mental Health Nursing II 4

- Focuses on the development of two modalities of psychiatric skills and treatment.
- Core concepts of cognitive and group therapy are integrated with specific strategies for behavioral change.
- **PREREQ:** NURS671.
- **RESTRICTIONS:** Open to matriculated graduate nursing students only.

### NURS 686 Clinical Nurse Specialist Role Integration 4

- Integration of theories and concepts related to roles of the clinical nurse specialist.
- Emphasizes advanced practice roles within the broad context of healthcare.
- **PREREQ:** All required courses.

### NURS 687 Nursing Science: Research Application 3

- Focuses on the application of research to nursing practice. Includes critical analysis of research through an organized critique process, evaluation of data, and examination of facilitators and barriers to research utilization, and methods of quality management.
- **PREREQ:** NURS609.
- **RESTRICTIONS:** Open to majors only. Permission required from department.

### NURS 690 Colloquium: Nursing 0 PP

- Lectures by faculty and visiting researchers provide a broad overview of the scope as well as significant results of current research in nursing sciences.

### NURS 868 Research Scholarly Project 1-3

- Investigation of a problem in clinical settings related to finance, administration, personnel management, public policy or education, resulting in completion of a scholarly project.

### NURS 869 Master's Thesis 1-6
### Operations Research

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>ORES 401</td>
<td>Introduction to Operations Research</td>
<td>3</td>
<td>Introduction to the methodologies of operations research with particular focus on their application in areas such as agriculture, environmental systems, health care, manufacturing and transportation. Case studies and applied problem solving are emphasized. PREREQ: MATH241 and MATH242</td>
</tr>
<tr>
<td>ORES 601</td>
<td>Survey Operations Research I</td>
<td>3</td>
<td>Covers various deterministic mathematical programming methods (LP, integer dynamic), network models and basic inventory models. PREREQ: Linear algebra</td>
</tr>
<tr>
<td>ORES 602</td>
<td>Survey Operations Research II</td>
<td>3</td>
<td>Covers various stochastic operations research models including decision theory, game theory, project planning, inventory models, simulation, markov decision processes and Queuing models. PREREQ: Linear algebra and MATH630.</td>
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<tr>
<td>ORES 603</td>
<td>Simulation Modeling and Analysis</td>
<td>3</td>
<td>Instructors from hard sciences and social sciences introduce real-world Operations Research case studies based on their expertise. Students implement proposed solution methodologies using a variety of available computer software packages. PREREQ: ORES601 and permission of director/instructor. COREQ: ORES602.</td>
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<tr>
<td>ORES 615</td>
<td>Advanced Prices and Statistics</td>
<td>3</td>
<td>See FREC815 for course description.</td>
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<tr>
<td>ORES 650</td>
<td>Urban Transportation Systems</td>
<td>3</td>
<td>See CIEG650 for course description.</td>
</tr>
<tr>
<td>ORES 664</td>
<td>Operations Research Internship</td>
<td>1-6 PF</td>
<td>Supervised, on-the-job experience, performing technical work for clients including OR applications, econometrics and statistical applications. RESTRICTIONS: Requires permission of instructor</td>
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<tr>
<td>ORES 690</td>
<td>Operations Research Seminar</td>
<td>0 PF</td>
<td>Seminars to be given by faculty and by visiting academia, industry and government persons. Graduate students provide topical insights in significant methods and results of current research in operations research.</td>
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<tr>
<td>ORES 802</td>
<td>Operations Research Applications</td>
<td>3</td>
<td>Applications of models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queuing theories, maintenance and replacement of equipment and government planning. Contemporary models from research literature of energy management, urban planning, artificial intelligence and flexible manufacturing systems. COREQ: MATH259, STAT601 or MATH630.</td>
</tr>
<tr>
<td>ORES 806</td>
<td>Research Techniques and Procedures</td>
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<td>See FREC806 for course description.</td>
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<td>ORES 810</td>
<td>International Agricultural Trade Special Topics</td>
<td>3</td>
<td>See FREC810 for course description.</td>
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<td>Advanced Production Economics</td>
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<td>ORES 834</td>
<td>Seminar in Resource Economics</td>
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<td>Research</td>
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<tr>
<td>ORES 964</td>
<td>Pre-Candidacy Study</td>
<td>3-12 PF</td>
<td>Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work. RESTRICTIONS: Not open to students who have been admitted to candidacy.</td>
</tr>
<tr>
<td>ORES 969</td>
<td>Doctoral Dissertation</td>
<td>1-12 PF</td>
<td>See WOMS210 for course description.</td>
</tr>
</tbody>
</table>

### Philosophy

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 100</td>
<td>Philosophies of Life</td>
<td>3</td>
<td>Survey of selected past and present philosophies that people strive to live by, typically including individualistic, group-oriented, religious and nonreligious positions.</td>
</tr>
<tr>
<td>PHIL 101</td>
<td>Great Western Philosophers</td>
<td>3</td>
<td>Survey of the key ideas of great Western philosophers concerning the nature of reality and how it is known. Focus on individual philosophers such as Plato, Aristotle, Descartes, Kant, Hegel, James and Wittgenstein.</td>
</tr>
<tr>
<td>PHIL 102</td>
<td>Introduction to Philosophy</td>
<td>3</td>
<td>An examination of such central philosophical problems as ethics, theories of knowledge, the nature of reality, philosophy of religion and political philosophy.</td>
</tr>
<tr>
<td>PHIL 105</td>
<td>Critical Thinking</td>
<td>3</td>
<td>Emphasis on developing skill at logical criticism of arguments. Topics include informal fallacies, deceiving with statistics, the role of definitions in reasoning, the importance of evidence and confirmation.</td>
</tr>
<tr>
<td>PHIL 109</td>
<td>Modern Religious Issues</td>
<td>3</td>
<td>The biblical world view and modern science, controversies over the nature of Scripture, doctrines of religious authority, the nature of theological language and existentialist interpretations and myth.</td>
</tr>
<tr>
<td>PHIL 125</td>
<td>Topics: Philosophy in Popular Culture</td>
<td>1-4</td>
<td>Philosophical ideas expressed in popular media such as science fiction or fantasy literature, films and music. Topics are variable. RESTRICTIONS: May be repeated for up to four credit hours.</td>
</tr>
<tr>
<td>PHIL 200</td>
<td>Business Ethics</td>
<td>3</td>
<td>Ethical theory applied to moral problems in business. Corporate social responsibility, and ethical issues in advertising, personnel and investment.</td>
</tr>
<tr>
<td>PHIL 201</td>
<td>Social and Political Philosophy</td>
<td>3</td>
<td>Classical and contemporary views on such problems as the proper scope and functions of government, on what a just distribution of wealth is, and on the extent of an individual's rights, liberties and obligation to obey the law.</td>
</tr>
<tr>
<td>PHIL 202</td>
<td>Contemporary Moral Problems</td>
<td>3</td>
<td>The application of philosophical techniques to contemporary moral problems such as abortion, punishment, biomedical ethics, reverse discrimination and sexual morality. May be cross-listed with WOMS203.</td>
</tr>
<tr>
<td>PHIL 203</td>
<td>Ethics</td>
<td>3</td>
<td>Study of moral value, moral obligation and moral virtue through comparison of notable schools of ethical theory, including utilitarianism, existentialism, Kantianism, classical Greek eudaimonism, pragmatism and Thomism.</td>
</tr>
<tr>
<td>PHIL 204</td>
<td>World Religions</td>
<td>3</td>
<td>Varieties of religious belief and practice from diverse cultures, including representative Asian and Western traditions, studied mainly in terms of their historical development and importance.</td>
</tr>
<tr>
<td>PHIL 205</td>
<td>Logic</td>
<td>3</td>
<td>Concepts and techniques of elementary symbolic logic: truth and consistency of sentences, validity and soundness of arguments; translation of English sentences into a formal language, construction of truth tables and the use of a system of natural deduction to prove the validity of deductive arguments.</td>
</tr>
<tr>
<td>PHIL 207</td>
<td>Scientific Reasoning</td>
<td>3</td>
<td>Critical survey of basic concepts and forms of inductive reasoning. Applications to the physical, social and biomedical sciences. Topics include: interpretations of probability, probabilistic fallacies, methods of statistical induction, logic of hypothesis testing, judging correlations, criteria of causation, experimental design and definitions of confirmation.</td>
</tr>
<tr>
<td>PHIL 208</td>
<td>Introduction to Jewish Philosophy</td>
<td>3</td>
<td>Fundamental issues in philosophy of religion reflecting both general theological approaches to resolving the tension between philosophy and religion and the uniquely Jewish attempt to do so. Topics include: God, miracles, good and evil, divine commandments and free will. May be cross-listed with JWST208.</td>
</tr>
<tr>
<td>PHIL 209</td>
<td>Philosophy of Religion</td>
<td>3</td>
<td>Religious experience, proofs for God's existence, religious language and critiques of religion. Selected special topics such as mysticism, evil, atheism, miracles, immortality and myth.</td>
</tr>
<tr>
<td>PHIL 210</td>
<td>Women and Religion</td>
<td>3</td>
<td>See WOMS210 for course description.</td>
</tr>
</tbody>
</table>
PHILOSOPHY

PHIL 390  HONORS COLLOQUIUM  3
See ARSC390 for course description

PHIL 392  HONORS COLLOQUIUM  3
Racism, sexism and skepticism
May be cross-listed with WOMS392

PHIL 444  MEDICAL ETHICS  3
Seminar focuses on such topics as experimentation with human subjects, genetic engineering and the moral problems of health care
May be cross-listed with CSC444
RESTRICTIONS: For students of philosophy and health professions

PHIL 448  ENVIRONMENTAL ETHICS  3
Ethical problems associated with environmental protection, local, national, and international
Relations to social and political movements Seminar format

PHIL 454  PHILOSOPHY OF SOCIAL SCIENCE  3
Critical examination of the central historical and contemporary questions about the concepts, methods, social structure and purposes of social science inquiry
May be cross-listed with ANTH465
PREREQ: A theory of methodology course in a social science, or an epistemology or philosophy of science course

PHIL 463  ETHICAL THEORY  3
Justification of ethical beliefs, alternative criteria of moral rightness and the meaning of moral concepts
PREREQ: PHIL202 or PHIL203

PHIL 465  SENIOR SEMINAR  3
Various authors and themes; e.g., Plato, Kant, epistemology, philosophy of mind
RESTRICTIONS: May be repeated once for credit when topics vary

PHIL 466  INDEPENDENT STUDY  1-6

PHIL 467  PHILOSOPHY OF TECHNOLOGY  3
Philosophical reflections on working with tools in the broadest sense; definitions; studies of processes, products and uses; and ethical, cultural and political critiques Seminar format
May be crosslisted with CSC647, MAL647, and/or UAPP647

PHIL 468  ENVIRONMENTAL ETHICS  3
Ethical problems associated with environmental protection, local, national, and international
Relations to social and political movements Seminar format
May be crosslisted with MAL648 and/or UAPP648

PHIL 868  RESEARCH  1-3
A detailed study of certain philosophical problems with special reference to research problems under way in the department

PHYSICS AND ASTRONOMY

PHYS 104  ELEMENTARY PHYSICS  3
Overview of the principles of physics and their applications. Course is designed for beginners with no previous exposure to physics.
RESTRICTIONS: Requires working knowledge of algebra and the use of scientific notation. Only one course among PHYS104, PHYS201, PHYS207 and SCEN101 can count toward graduation.

PHYS 133  INTRODUCTION TO ASTRONOMY  4
Objects of the universe from the earth to galaxies. How the universal laws that govern them; e.g., gravity and electromagnetic radiation, permit us to learn their nature from quantitative observations. Telescopic observations, visual and electronic, included in the laboratory.

PHYS 139  STAR AND CONSTELLATION IDENTIFICATION  1
Familiarity with the sky. Its changing aspects, constellations, mythology, bright stars, and planets. Topics will include use of sky maps and coordinates, how to estimate directions and time from knowledge of the sky, and the use of binoculars and small telescopes.

PHYS 140  GREAT CONCEPTS OF PHYSICS  3
Designed for non-science majors, will concentrate on understanding both the concept and impact of five great concepts of physics: the Newtonian Universe, Conservation of Energy, Entropy, Relativity, and Wave-Particle Duality. The influence of these concepts in other areas of human concern, e.g., philosophy, art, history, politics, medicine, etc. will be an important feature

PHYS 141  LIGHT, LASERS, CAMERAS, PERCEPTION  3
Introduction to the phenomena of light, optics and perception for non-science majors. Topics include: nature of light, sources of light and shadows, rainbows, mirages and other atmospheric phenomena, cameras, telescopes, microscopes, color creation and observation, physics influences in art, the human eye and perception

PHYS 143  ENERGY TECHNOLOGY AND SOCIETY  3
Basic principles of physics are applied to discuss forms of energy (mechanical, thermal, chemical, electrical and nuclear), and how energy is derived from sources such as coal, petroleum, solar, nuclear fusion and fusion Environmental consequences of energy use are treated
PREREQ: College algebra

PHYS 144  CONCEPTS OF THE UNIVERSE  3
Survey of astronomy emphasizing early and modern concepts. Stars, planets, galaxies, cosmic evolution and intelligent life are studied in the context of physical principles which describe the dynamics of the universe. Scientific process is used to interpret observations that shape our perceptions of the cosmos.
RESTRICTIONS: Not for credit to students who have taken PHYS133

PHYS 145  BLACK HOLES AND COSMIC EVOLUTION  3
Geared toward a general audience and focuses on topics such as finding black holes in space, the nature of space, time and black holes; the origin of the Universe; and the development of complex life here on Earth

PHYS 146  QUARKS, GLUONS, AND THE BIG BANG: PARTICLES AND COSMOLOGY  3
Non-mathematical course focusing on the elementary particles and their influence on the early evolution of the universe. Major topics are quarks and the forces they feel, Einstein's theory of relativity, Quantum Mechanics made fairly simple, and the Inflationary Universe
RESTRICTIONS: Requires high school algebra

PHYS 147  ATOMS FOR EVERYONE  3
Elementary but earnest inquiry into the sources of our knowledge that these completely invisible building blocks of ordinary matter exist as discrete entities, and exist to the exclusion of all other possibilities
RESTRICTIONS: Requires high school algebra

PHYS 169  PERSPECTIVES ON PHYSICS AND ASTRONOMY  1
First year seminar providing an introduction to the practice of physics and astronomy. Topics include research, education, careers, and the relation of physics to society
RESTRICTIONS: Priority given to first year students. Intended for science majors.

PHYS 199  EXPLORING PHYSICS CONCEPTS I  3
Exploration of physics concepts for first year students with no prior physics background. Emphasis on physics of light, color, electrical circuits and structure of matter
RESTRICTIONS: Open to first year students only and to university studies majors.

PHYS 201  INTRODUCTORY PHYSICS I  4
First course in a sequence with PHYS202 that provides an introduction to physics for students in the life and environmental sciences. Emphasis on topics including mechanics, fluid dynamics, optics and thermodynamics
PREREQ: MATH115
RESTRICTIONS: Requires a strong mathematics background in geometry, algebra and trigonometry. Only one course among PHYS104, PHYS201, PHYS207 and SCEN101 can count toward graduation.

PHYS 202  INTRODUCTORY PHYSICS II  4
Final course in a sequence with PHYS201 that provides an introduction to physics for students in the life and environmental sciences. Topics include rotation and oscillatory motion, waves, electricity and magnetism, structure and properties of nuclei, atoms, molecules and solids
PREREQ: PHYS201
RESTRICTIONS: Only one course from PHYS202 and PHYS208 can count toward graduation

PHYS 207  FUNDAMENTALS OF PHYSICS I  4
First course in a sequence with PHYS208 and PHYS209 that provides an introduction to physics for those in the physical sciences and engineering
Emphasis is on Newton's laws of motion, force laws, and conservation principles integrates conceptual understanding with extensive problem solving and laboratory experience
COREQ: MATH241
RESTRICTIONS: One year of high school calculus is recommended. Only one course from PHYS104, PHYS207 and SCEN101 can count toward graduation.
PHYS 208  FUNDAMENTALS OF PHYSICS II  4
Second course in a sequence with PHYS107 and PHYS209 that provides an
introduction to physics for those in the physical sciences and engineering. The
emphasis is on electricity and magnetism force laws, fields and electrical circuits.
PREREQ: PHYS207.
COREQ: MATH242
PHYS 245  INTRODUCTION TO ELECTRICITY AND ELECTRONICS  4
Fundamentals of electricity and magnetism specific to DC and AC circuit analysis.
Transient circuit behavior and rotating machinery. Fundamentals of analog and
digital electronics, with emphasis on applications in engineering, integrated
circuits and operational amplifiers.
PREREQ: PHYS207.
COREQ: MATH243
RESTRICTIONS: Not for major credit
PHYS 309  PHYSICS OF THE TWENTIETH AND TWENTY FIRST CENTURIES  3
Fundamentals in physics that help form a modern understanding of science and
technology. Intended for physical science and engineering majors, the emphasis
is on electromagnetic radiation, quantum mechanics, nuclear reactions, Bohr atom,
solid state physics and devices, and relativity.
PREREQ: PHYS206.
COREQ: MATH243 suggested
PHYS 310  INTRODUCTION TO THERMAL PHYSICS  3
Basic concepts of thermodynamics including properties of substance, first and
second law analysis of systems and control volumes, entropy and availability.
Power and refrigeration cycles
PREREQ: PHYS207.
PHYS 313  PHYSICAL OPTICS  4
A detailed treatment of physics at an intermediate level appropriate for physics,
engineering and other students with a physical science background. Emphasis is
on physical concepts and analysis of geometric optics, wave optics and
applications of optics.
COREQ: MATH243
PHYS 366  INDEPENDENT STUDY  1-3
PHYS 419  CLASSICAL MECHANICS I  3
Intermediate course which emphasizes the fundamental principles of classical
mechanics. Treats in detail and with mathematical rigor, particle mechanics,
conservation laws, harmonic oscillation, motion under central force, rigid body
dynamics, and moving coordinate systems.
COREQ: MATH302
PHYS 424  QUANTUM MECHANICS  3
Introduces quantum mechanical concepts by reviewing experiments which cannot
be explained by classical physics. The Schrodinger equation is solved for simple
cases such as free-particle motion, the simple harmonic oscillator and the
hydrogen atom, with a basic treatment of angular momentum.
May be cross-listed with CHEM424 and/or ELEC424
PREREQ: PHYS309, MATH302 and MATH349
PHYS 431  ACOUSTICS  3
Vibrations of particles, strings and membranes; acoustic waves; radiation of
sound; room acoustics; and acoustic measurements.
PREREQ: MATH243 and PHYS207
PHYS 445  ELECTRONICS FOR SCIENTISTS  3
Fundamentals of analog and digital electronics, with emphasis on applications in
science. Circuit analysis, operational amplifiers, filters, gates, flip-flops, counters,
analog to digital and digital to analog converters.
PREREQ: PHYS208
PHYS 446  INSTRUMENTATION FOR SCIENTISTS  3
Electronic measurements and instrumentation with emphasis on applications in
science. Amplification, noise, low-level signal recovery, lock-in amplifiers, digital
signal averaging, frequency and time measurements, transducers, bridges,
interface to laboratory computers and automation of experiments.
PREREQ: PHYS208
PHYS 449  INTRODUCTION TO RESEARCH  1-6
Undergraduate research on an assigned problem carried out under the
supervision of the staff.
PHYS 460  COMPUTATIONAL METHODS OF PHYSICS  3
Introduction to basic computational techniques in science with application to a
number of disciplines of current research interest, such as quantum physics,
biophysics, statistical mechanics and chaos.
PREREQ: MATH302 or MATH341, CISC105 or equivalent, PHYS208.
PHYS 466  INDEPENDENT STUDY  1-3
PHYS 469  OBSERVATIONAL ASTRONOMY  3
Hands-on experience focusing on the techniques and analysis of astronomical
observation, with emphasis on CCD imaging. Topics include celestial coordinates,
telescope handling, CDs, data reduction, and data analysis.
RESTRICTIONS: Meets at Mt. Cuba Observatory in Greenville
PHYS 501  TOPICS IN MIDDLE SCHOOL PHYSICS EDUCATION: FORCE AND
MOTION  3
Application of scientific principles to topics related to Newton's first law, motion,
force, electric circuits, magnetism, electromagnets, motors, and generators.
RESTRICTIONS: Restricted to in-service middle school teachers.
PHYS 502  TOPICS IN MIDDLE SCHOOL PHYSICS: PLANETARY SYSTEMS  3
Application of physics principles to topics related to the earth, moon, sun, planets,
and seasons.
RESTRICTIONS: Restricted to in-service middle school science teachers
PHYS 503  TOPICS IN MIDDLE SCHOOL SCIENCE EDUCATION:
PROPERTIES OF MATTER  3
Application of scientific principles to topics related to the particle model and
density, phase change, mixtures and solutions, and separation techniques.
RESTRICTIONS: Restricted to in-service middle school science teachers.
PHYS 504  TOPICS IN MIDDLE SCHOOL SCIENCE EDUCATION:
TRANSFORMATION OF ENERGY  3
Application of scientific principles to topics related to energy changes, heat, light,
and topics in other middle school science curricula such as ecosystems and
weather systems.
RESTRICTIONS: Restricted to in-service middle school science teachers.
PHYS 511  TOPICS IN HIGH SCHOOL PHYSICS: FORCE, MOTION AND
ENERGY  3
Application of physics principles to topics related to Newton's Three Laws, work
and mechanical energy.
RESTRICTIONS: Restricted to in-service high school science teachers.
PHYS 600  PHYSICS RESEARCH TALKS  1 PF
Lectures by Physics and Astronomy faculty describing their current research to aid
graduate students in selection of an area of thesis research.
PHYS 601  INTRODUCTION TO TEACHING PHYSICS AND ASTRONOMY  1 PF
Introduction to the methods and techniques of teaching and tutoring physics at a
level appropriate for teaching assistants and tutors of undergraduate courses in
Physics and Astronomy. Discussion and workshop formats will be used during the
course.
PHYS 603  ELECTRICITY AND MAGNETISM I  3
First of a two-part sequence (with PHYS604) that provides an intermediate level
treatment of electrostatics and magnetostatics, as well as an introduction to
electrodynamics. Topics include a discussion of different techniques used for the
calculation of electrostatic and magnetostatic fields in vacuum and in matter, and
effects of time varying electric and magnetic fields.
PREREQ: PHYS208, MATH242
COREQ: MATH403 suggested
PHYS 604  ELECTRICITY AND MAGNETISM II  3
Second in a two-part sequence (with PHYS603) that provides an intermediate level
treatment of electrodynamics. Specific topics include a discussion of
conservation laws, electromagnetic waves and radiation, and the theory of
special relativity.
RESTRICTIONS: PHYS603.
PHYS 607  METHODS OF MATHEMATICAL PHYSICS  3
Mathematics commonly used in physics. Main topics are linear algebra, vector
analysis, Fourier series, integral transforms, and eigenfunction methods for
differential equations.
PHYS 608  METHODS OF MATHEMATICAL PHYSICS  3
Continuation of PHYS607. Main topics are partial differential equations, complex
variables, tensors, calculus of variations, group theory and representation theory,
and probability and statistics.
PREREQ: PHYS607
PHYS 610  QUANTUM MECHANICS  3
Wave-particle duality. The Schrodinger equation. One-dimensional problems.
Spherically symmetric potentials. Orbital angular momentum. Applications
including hydrogenic atoms.
PREREQ: PHYS424
**PHYS 616 Kinetic Theory and Thermodynamics** 3
Postulates of equilibrium thermodynamics; review of relevant mathematics; entropy maximum principle; energy minimum principle; Legendre transformations. Entropy representation, internal energy representation, Helmholtz representation and Gibbs representation. Maxwell relations, reduction of partial derivatives; phase transitions; statistical mechanics via Boltzmann's elementary method; equipartition of energy; applications. May be crosslisted with ELEG 616. PREREQ: MATH 243 and PHYS 309.

**PHYS 620 Classical Mechanics II** 3
Topics covered are Lagrangian and Hamiltonian dynamics, dynamics of systems of particles, rigid bodies and fluids, oscillations of systems of coupled particles, oscillations and waves in continuous systems. Provides a classical introduction to techniques that are used extensively in quantum and statistical physics. PREREQ: MATH 302 and PHYS 319.

**PHYS 621 Fundamentals of Modern Physics** 3
Application of quantum mechanics and the theory of relativity to selected topics in physics, with emphasis on elementary particle physics. PREREQ: MATH 302 and PHYS 324.

**PHYS 624 Introduction to Solid State Physics** 3
X-ray diffraction, structure and properties of metals, insulators and semiconductors, and band theory of solids; includes electrical, optical, magnetic, and thermal properties. PREREQ: PHYS 616 and PHYS 621.

**PHYS 631 Acoustics** 3
Vibrations of particles, strings and membranes; acoustic waves; radiation of sound; room acoustics; and acoustic measurements. PREREQ: MATH 302.

**PHYS 632 Astrophysics** 3
Survey of diverse astronomical objects and the physical principles used in modeling them. Emphasis on the observational basis and foundations of astrophysics. Stellar magnitudes, colors and spectra; the HR diagram; solar and stellar activity; binary stars; the phenomena of galactic and extragalactic astronomy. PREREQ: MATH 302 plus 14 credit hours of physics.

**PHYS 633 Introduction to Stellar Astrophysics** 3
Introduction to the physics of stellar interiors and atmospheres. The evolution of stars is explored by studying the changes in internal composition due to nuclear reactions. The physical processes underlying stellar spectra are investigated. Computer simulations of stars and their atmospheres may be used. PREREQ: PHYS 632 and MATH 302.

**PHYS 638 Selected Topics in Physics** 3
Treatment of a specialized subject taken from the following list: particle astrophysics, magnetic materials, electron microscopy, elementary particles, cosmology, solar physics and other advanced topics. RESTRICTIONS: May be repeated for credit when topics vary.

**PHYS 645 Electronics for Scientists** 3
Fundamentals of analog and digital electronics, with emphasis on applications in science. Circuit analysis, operational amplifiers, filters, gates, flip-flops, counters, analog to digital and digital to analog converters. PREREQ: PHYS 520.

**PHYS 646 Instrumentation for Scientists** 3
Electronic measurements and instrumentation with emphasis on applications in science. Amplification, noise, low-level signal recovery, lock-in amplifiers, digital signal averaging, frequency and time measurements, transducers, bridges, interfacing to laboratory computers and automation of experiments. PREREQ: PHYS 520.

**PHYS 660 Computational Methods of Physics** 3
Introduction to basic computational techniques in science with application to a number of disciplines of current research interest, such as quantum physics, biophysics, statistical mechanics and chaos. PREREQ: MATH 302 or MATH 341, CIS/CIS 105 or equivalent, PHYS 520.

**PHYS 669 Observational Astronomy** 3
Hands-on focus on techniques and analysis of astronomical observation, with emphasis on CCD imaging. Topics include celestial coordinates, telescope handling, CCDs, data reduction, and data analysis. RESTRICTIONS: Meets at Mt. Cuba Observatory in Greenville.

**PHYS 803 Solid State Physics** 3
Crystal structure; mechanical, thermodynamic, electrical, optical and magnetic properties of solids; and imperfections in crystals. PREREQ: PHYS 524.

**PHYS 809 Electromagnetic Theory** 3
Review of statics; Maxwell's equations, physical optics and wave guides. May be crosslisted with ELEG 809. PREREQ: PHYS 604.

**PHYS 810 Electromagnetic Theory** 3

**PHYS 811 Quantum Mechanics** 3
Develops formal description of quantum systems as states in a complex vector space. Topics include time evolution, path integrals, symmetry groups and conservation laws, parity, angular momentum and tensor operators, operator treatment of the harmonic oscillator, definite particles, time independent and time dependent perturbation theory, and radiative transitions. Includes a summary of special functions and boundary problems appropriate to simple quantum systems. PREREQ: PHYS 607 and PHYS 610.

**PHYS 812 Quantum Mechanics** 3
Continuation of PHYS 811. Topics include: many-particle wave functions and many-body operators, helium atom, second quantization, advanced topics in perturbation theory; the Hartree-Fock method, a continuation of radiative transitions, scattering theory, and relativistic quantum mechanics; Measurement theory and the interpretation of quantum mechanics. Applications of quantum mechanics discussed throughout. PREREQ: PHYS 811.

**PHYS 813 Statistical Mechanics and Thermodynamics** 3
Review of equilibrium thermodynamics and probability theory. Kinetic theory including the Boltzmann equation; Gibbsian ensemble theory in classical and quantum statistical mechanics. Classical ideal gases with internal degrees of freedom; Dissociation equilibrium. The ideal Bose and Fermi gases with elementary applications to fluids and solids. May be crosslisted with ELEG 813. PREREQ: PHYS 616.

**PHYS 815 Theory of Relativity** 2-3
Critique of the special theory introductory to the general theory; physical basis of the general theory; Einstein's field equations; and problems of gravitational motion and radiation. PREREQ: PHYS 809.

**PHYS 817 Advanced Classical Dynamics** 3
Theoretical treatment of classical dynamics. PREREQ: PHYS 600.

**PHYS 833 Advanced Treatment of Selected Topics** 3
Selected topics taken from the following list: quantum field theory, renormalization group and critical phenomena, nuclear theory, elementary particles and applications of group theory in physics. RESTRICTIONS: May be repeated for up to six credit hours when topics vary.

**PHYS 862 Solid State Seminar** 1
Lectures and discussions by faculty and students on specialized topics in solid state physics.

**PHYS 866 Research** 1-9

**PHYS 869 Master's Thesis** 1-6

**PHYS 964 Pre-Candidacy Study** 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required coursework. RESTRICTIONS: Not open to students who have been admitted to candidacy.

**PHYS 969 Doctoral Dissertation** 1-12 PF

**Physical Therapy**

**PHYT 466 Independent Study** 1-6

**PHYT 600 Physical Therapy as a Profession** 1
The ethics, licensure laws and practice of physical therapy will be explored. The Guide to Physical Therapy Practice will be introduced and the importance of effective practice discussed. RESTRICTIONS: Open to physical therapy graduate students only.
PHYT 604 Functional Anatomy and Biomechanics 4
Gives a description of normal and abnormal human movement. Emphasis on joint structure and function and gait using orthokinetic and statokinetic analysis. Evaluation procedures such as EMG, cinematography and computer simulations utilized.
RESTRICTIONS: Open to physical therapy graduate students only or with permission of instructor.

PHYT 605 Clinical Internship 1–9 PF
Full- or part-time clinical experiences at various health care facilities.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 606 Research 3
An overview of methodological issues in the conduct of physical therapy research. Topics include scientific method, experimental design, statistical procedures and technical writing. Student expected to critically analyze current physical therapy literature.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 608 Musculoskeletal Evaluation and Treatment 4
In-depth analysis of evaluation and treatment strategies of spinal and extremity joints, muscles and connective tissue. Emphasis on the physiological basis of immobilization and remobilization. The diagnoses, prognosis, treatment, consultation and basis for referral of orthopaedic and musculoskeletal disorders are examined.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 610 Psychosocial Aspects of Disabilities 2
Discusses the psychosocial characteristics of patient populations and therapists that impact on the rehabilitative process. Time management, death and dying, sexuality, love and hate and other topics are discussed.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 613 Advanced Orthopedics 3 PF
Discusses various schools of orthopedic intervention.
RESTRICTIONS: Open to DPT Program students only.

PHYT 614 Sports Physical Therapy 3 PF
Analyzes the various competencies required in the practice of sports physical therapy. Clinical skill acquired.
RESTRICTIONS: Open to DPT Program students only.

PHYT 615 Advanced Neurotherapeutics 3
Discusses an integration of the various neurodevelopmental approaches to the treatment of the neurological patient.
RESTRICTIONS: Open to DPT Program students only.

PHYT 616 Pediatrics Seminar 3 PF
Discusses selected problems encountered by the pediatric population. Studies the evaluation, treatment and research basis of these problems.
RESTRICTIONS: Open to DPT Program students only.

PHYT 617 Patient Management II 3
Teaches the theory and skills necessary for the physical therapy management of patients commonly seen in rehabilitation settings.
RESTRICTIONS: Open to DPT Program students only.

PHYT 618 Life Span Development 3
A study of human development and aging from birth through death. Emphasis on motor, sensory and cognitive functions and dysfunction.
RESTRICTIONS: Open to DPT Program students only.

PHYT 619 Advanced Seminar 2
Lectures pursue various topics in greater depth and develop advanced clinical skills. Examples include burn and wound care, hand therapy, geriatrics and obesity. Individualized clinical experiences may be arranged.

PHYT 620 Educational Process in Community Health 1
Focuses on the learning/teaching process as defined in the Guide to Physical Therapy Practice for application to the teaching roles of the health professional.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 621 Practice Clinic 3 PF
Student participation in faculty practice clinic treating referrals for physical therapy. All students participate in the clinic at least one semester.
RESTRICTIONS: Open to DPT Program students only.

PHYT 622 Clinical Gross Anatomy 6
Emphasis on structural and functional aspects of regions of body under study by means of human cadavers, bones, surface anatomy, lectures, computer technology and demonstrations. Clinical significance of anatomical structures is stressed.
RESTRICTIONS: Open to DPT Program students only.

PHYT 623 Clinical Neurosciences 4
A study of the structure and function of the human nervous system with major emphasis on the cause-effect relationships between lesions and their symptoms. Emphasis on the neural mechanisms controlling movement.
RESTRICTIONS: Open to DPT Program students only or by permission of instructor.

PHYT 624 Basic Evaluation Techniques 2
Provides an understanding of the philosophy and practice of patient evaluation and physical therapy diagnosis. Muscle performance testing and measurement of joint motion of the extremities will be emphasized.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 626 Advanced Regional Anatomy 3 PF
Structural and functional aspects of regions of the body under study are emphasized by means of a dissection of a specific region of the human body.
RESTRICTIONS: Open to DPT Program students only.

PHYT 630 Human Movement Control 3
Examines theoretical, methodological and empirical issues required for an understanding of the control and coordination of human movement. Readings and group discussion of the impact of issues raised in the literature.
RESTRICTIONS: Open to DPT Program students only.

PHYT 631 Physical Therapy in the Acute Care Environment 4
Presents diagnoses commonly seen in the acute care environment. The physiological, anatomical, evaluation, documentation and treatment considerations in managing these diagnoses are discussed.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 632 Applied Physiology I 3
In-depth analysis of the physiological mechanisms of the cardio-pulmonary system. Emphasis placed on the musculoskeletal system and on exercise prescription and progression.
RESTRICTIONS: Open to DPT Program students only.

PHYT 633 Applied Physiology II 3
Discusses the research on the effects of exercise on the various patient populations (not including cardiopulmonary). Emphasis placed on the musculoskeletal system and on exercise prescription and progression.
RESTRICTIONS: Open to DPT Program students only.

PHYT 634 Electrotherapy 4
Provides an understanding of the physiological basis for the use of physical agents and electrotherapy. Emphasis placed on patient evaluation and clinical applications of modalities used in physical therapy practice.
RESTRICTIONS: Open to DPT Program students only.

PHYT 635 Thermal Agents and Soft Tissue Techniques 2
An introduction to thermal modalities and soft tissue mobilization techniques commonly used in current physical therapy practice.
RESTRICTIONS: Open to DPT Program students only.

PHYT 641 Rounds I 1 PF
Weekly clinical cases presented by faculty, clinical faculty, doctoral students and residents in Grand Rounds format for discussion by all students in the physical therapy graduate program.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 642 Rounds II 1 PF
Weekly clinical cases presented by faculty, clinical faculty, doctoral students and residents in Grand Rounds format for discussion by all students in the physical therapy graduate program.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 643 Rounds III 1 PF
Weekly clinical cases presented by faculty, clinical faculty, doctoral students and residents in Grand Rounds format for discussion by all students in the physical therapy graduate program.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 644 Rounds IV 1 PF
Weekly clinical cases presented by faculty, clinical faculty, doctoral students and residents in Grand Rounds format for discussion by all students in the physical therapy graduate program.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 801 Medical Science I: General Medicine 3
Lectures in pathology, clinical medicine, cardiology and pharmacology across the lifespan. Implications for physical therapy are emphasized.
RESTRICTIONS: Open to physical therapy graduate students only.
PHYSICAL THERAPY

PHYT 802 MEDICAL SCIENCE II: ORTHOPEDICS 3
Orthopedic pathology, medical and surgical management of musculoskeletal conditions across the lifespan with implications for physical therapy intervention. Includes radiology
RESTRICTIONS: Open to DPT Program students only

PHYT 803 MEDICAL SCIENCE III: NEUROLOGY 3
Lectures of basic principles of neurology throughout the lifespan. Emphasis placed on medical principles related to diseases most frequently encountered in physical therapy practice
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 804 NEUROPHYSIOLOGIC EVALUATION AND TREATMENT 4
Basic evaluation and treatment methods for managing patients with neurological dysfunctions. Analysis of these methods in light of current issues and theories of motor control, motor learning and neurobehavioral plasticity. Emphasis on learning strategies for treatment rather than through details of specific approaches
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 805 REHABILITATION 4
Advanced instruction in the theory, research and clinical skills necessary for the comprehensive management of clients in a rehabilitation setting with an emphasis on building evidence-based program plans
RESTRICTIONS: Open to DPT Program students only

PHYT 806 GERIATRICS 3
The personal-social, biological, socioeconomic and physiological factors accompanying the aging process will be examined and their impact on physical therapy intervention explored.
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 807 ADVANCED SEMINAR 5
Lectures pursue various topics in greater depth and develop advanced clinical skills. Topics include wound care, hand therapy, women's health issues, vestibular rehabilitation and aquatic therapy
RESTRICTIONS: Open to DPT Program students only

PHYT 808 SPINE MANAGEMENT 4
Discusses the biomechanics, pathophysiology and disability associated with spine pain and dysfunction. Includes an understanding of the role of physical therapy evaluation in the determination and implementation of physical therapy interventions.
RESTRICTIONS: Open to DPT Program students only

PHYT 809 PSYCHOLOGICAL ASPECTS OF HEALTH AND DISEASE 4
Discusses the psychosocial characteristics of patient populations and therapists that impact on the rehabilitation process. Death and dying, social implications of illness diagnosis and other topics are discussed.
RESTRICTIONS: Open to DPT Program students only

PHYT 810 CLINICAL MANAGEMENT 2
Discusses concepts of administration and issues in the management of hospital clinics, private practice and consultative ventures. Students introduced to current trends in billing and reimbursement strategies being used by clinicians
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 811 PEDIATRICS 4
Instruction in the theory, research and clinical skills necessary for the comprehensive management of pediatric clients and their families. Emphasis on the incorporation of modern developmental science into evidence-based program plans
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 812 PEDIATRIC INTEGRATED CLINICAL EXPERIENCE 1 PF
Mentored clinical experience in pediatric healthcare facilities
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 821 ORTHOPEDIC INTEGRATED CLINICAL EXPERIENCE 3 PF
Mentored clinical experience in University of Delaware Physical Therapy Clinic. Emphasis is orthopedic with some exposure to outpatients with other diagnoses. All students participate in this experience for one semester.
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 822 GERIATRIC INTEGRATED CLINICAL EXPERIENCE 3 PF
Student participation in local physical therapy settings evaluating and treating geriatric clients under the supervision of a licensed physical therapist. All students participate in this experience for one semester.
PREREQ: All previous physical therapy graduate courses
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 830 INTRODUCTION TO CLINICAL EDUCATION 1 PF
Preparation for academic progression into clinical internships. Major areas covered are CPR, blood borne pathogens, universal precautions, federal and state mandated regulation and professional issues
PREREQ: Enrollment in Doctor of Physical Therapy Program

PHYT 831 CLINICAL INTERNSHIP I: ACUTE CARE 3 PF
A six-week, full-time clinical experience in an acute care hospital setting. Students directly participate in all aspects of patient care under the supervision of a licensed physical therapist. Students involved in all aspects of patient care including, but not limited to evaluation, treatment, patient and family education, charting, billing, and discharge planning.
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 832 CLINICAL INTERNSHIP II: REHABILITATION 3 PF
An eight-week, full-time clinical experience in a rehabilitation setting. Students participate in direct patient care under the supervision of a licensed physical therapist. Students involved in all aspects of patient care including, but not limited to evaluation, treatment, patient and family education, charting, billing, team conferences with related disciplines, and discharge planning.
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 833 CLINICAL INTERNSHIP III: ELECTIVE 3 PF
An eight-week, full-time clinical experience under the supervision of a licensed physical therapist. Students may choose the type of experience they desire. Types available include acute care, orthopedics, rehabilitation or a specialty area.
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 834 CLINICAL INTERNSHIP IV 3 PF
A six-week, full-time clinical internship experience in an out-patient clinical setting. Students participate in direct patient care under the supervision of a licensed physical therapist.
PREREQ: All courses in DPT curriculum to date
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 868 RESEARCH 1-9
RESTRICTIONS: Requires permission of instructor

PLANT AND SOIL SCIENCES

PLSC 100 PLANTS AND HUMAN CULTURE 3
Historical survey of interrelationships between plants and diverse human cultures. Examines Asian, African, Mediterranean, North/South American peoples (ancient and modern) to provide a broad multicultural perspective and commentary on modern American values about plants and their environment

PLSC 101 BOTANY I 4
Introductory botany stressing fundamental concepts and processes in plants. Topics include cell structure and function, anatomy, genetics, reproduction, physiology, taxonomy, phylogeny and ecology

PLSC 105 INTRODUCTORY FORESTRY 3
Distribution, ecology, value, measurement and management of forest systems. PREREQ: PLSC101

PLSC 133 ORNAMENTAL HORTICULTURE 3
The use of ornamental plants. Emphasis on a basic knowledge of plant materials useful in maintaining an aesthetically and functionally pleasing environment in and around the home

PLSC 140 PEOPLE AND PLANTS: FEAST OR FAME 3
Exploration of plant pathology as a biological science with its important ties to human welfare. Topics include food production systems, famine caused by plant diseases and their impact on human culture

PLSC 151 INTRODUCTION TO CROP SCIENCE 3
Plant structure and plant processes with practical application to the production and management of commercial crops
RESTRICTIONS: Credit not allowed if preceded by PLSC401

PLSC 154 TOPICS IN PRODUCTION AND MANAGEMENT OF ORNAMENTAL PLANTS 1-6
Topics combine theory and practice in the areas of turf and ornamental horticulture
RESTRICTIONS: Not for major credit except as elective

PLSC 170 SOILS AND ENVIRONMENTAL QUALITY 3
Role of soils in contemporary environmental problems, including the nature and causes of soil, air and water pollution; soil management practices to minimize environmental impacts of nutrients, pesticides, agricultural and industrial wastes, and contaminated soils; risk management strategies needed to develop environmental management programs

PLSC 171 NEW STUDENT COLOQUIUM 1 PF
Focuses on academic, career and resources as important components in achieving success in the plant and soil sciences. Practical skills, helpful in mastering the first year in the plant and soil sciences majors
RESTRICTIONS: Open to first year majors only
PLSC 201  Botany II  4
Sexual and vegetative characters of algae, bacteria, fungi, liverworts, mosses, ferns, horsetails, club mosses, quillworts, gymnosperms and angiosperms. Selected genera within these divisions considered in detail
PREREQ: PLSC101 or BISC207

PLSC 204  Introduction to Soil Science  3
Fundamentals of soil including origin, composition and classification; physical, chemical and biological properties; significance of soil properties to use and management, and to soil-plant relationships.
PREREQ: CHEM101

PLSC 205  Introduction to Soil Science Laboratory  1
Laboratory exercises in soil science
COREQ: PLSC204

PLSC 211  Herbaceous Landscape Plants  3
Survey of herbaceous plants including annuals, perennials and bulbs; plant identification, culture, selection and design in the landscape.
PREREQ: PLSC133

PLSC 212  Woody Landscape Plants  4
The study of woody plants for landscape use in the mid-Atlantic coastal region, including plant identification, selection and culture.
PREREQ: PLSC133

PLSC 270  Biotechnology: Science and Socioeconomic Issues  3
See ANSC270 for course description.

PLSC 300  Principles of Animal and Plant Genetics  3
See ANSC300 for course description.

PLSC 302  Vegetable Science  4
Basic factors affecting productivity and marketability of vegetable crops.

PLSC 303  Introductory Plant Pathology  4
Introduction to the nature, causes, development, effects and control of plant disease. Laboratory involves microscope use for examining plant disease specimens and fungal structures, and experience in isolation and culture of pathogenic fungi.
PREREQ: PLSC201 or BISC207

PLSC 305  Soil Fertility and Plant Nutrition  4
Practical application of the basic principles of soil chemistry, physics and microbiology to modern land use programs. Covers basic principles of nutrient management (availability and cycling in soils, roles in plant nutrition), soil acidity and liming, soil testing, environmental fate of non-essential elements and organic chemicals, and role of risk assessment in soil management.
PREREQ: CHEM102 and PLSC204

PLSC 306  Introduction to Plant Molecular Biology  3
The molecular biology of higher plants, including organization of plant genes, genomes, gene expression, gene transfer and genetic engineering.
PREREQ: BISC207, CHEM213

PLSC 308  Fruit Science  3
Major temperate zone fruit crops, climatic requirements, growth and fruiting habits, and principles involved in production, harvesting and marketing.

PLSC 310  Animal and Plant Genetics Laboratory  1
See ANSC310 for course description.

PLSC 313  Turf Establishment and Maintenance  4
Factors affecting the establishment and maintenance of fine and utility turf; emphasis on the management of golf courses, athletic fields and sod farms.
PREREQ: PLSC204

PLSC 319  Environmental Soil Microbiology  4
Introduction to soil microbiology and biochemistry as related to environmental issues: microbial diversity and ecology in soil-plant systems, transformations of natural and synthetic organic compounds, biocycling of nutrients and metals, bioremediation. Introduction to laboratory methods for studying soil microorganisms and associated processes.
PREREQ: PLSC204 and CHEM102

PLSC 325  Nursery Production I  2
The planning, production, management and marketing of field grown nursery stock. Student selects crops, propagates them and is responsible for all aspects of production, including cost accounting.

PLSC 326  Nursery Production II  2
The planning, production, management and marketing of container-grown nursery stock. Student selects crops, propagates them and is responsible for all aspects of production, including cost accounting.

PLSC 330  Landscape Construction Details  4
Introduction to principles involved in the design and installation of landscape elements: stone, brick, concrete, wood and metal.

PLSC 331  Landscape Construction Systems  4
Introduction to principles involved in contour grading, site drainage, lighting and irrigation design related to landscaping.

PLSC 332  Basic Landscape Design  4
Application of design principles to actual field problems, drafting and presenting techniques.
PREREQ: PLSC212

PLSC 344  Forest Ecology  2
See ENVC344 for course description.
PREREQ: BISC208

PLSC 364  Landscape Horticulture Internship  1-6
Supervised, faculty-monitored, career-related experience in one or more aspects of the ornamental horticulture industry.
PREREQ: PLSC133

PLSC 366  Independent Study  1-6

PLSC 390  Honors Colloquium: Chocolate  3
The use of chocolate and its origin, horticulture, chemistry, nutrition and sensory evaluation.

PLSC 399  Teaching Experience  1-2 PF
Practical teaching experience assisting in instruction of an undergraduate course.
RESTRICTIONS: Requires overall GPA of 2.75 and 3.0 in major. Must have taken the course in which assisting or have equivalent experience.

PLSC 401  Agronomic Crop Science  3
Production and management of the major grain and forage crops, with emphasis on diagnosis of production problems and decision making.
PREREQ: PLSC151

PLSC 403  Nursery and Garden Center Management  4
Production, maintenance and marketing of plants relative to the establishment and management of a nursery or garden center.
PREREQ: PLSC101 or PLSC151

PLSC 404  Plant Taxonomy  3
Identification, classification and nomenclature of vascular plants, including sight recognition as well as use of alternative-statement keys. Emphasis on economic plant families of eastern U S.
PREREQ: PLSC201

PLSC 410  Introduction to Plant Physiology  3
The physiology of green plants: light and energy conversion, carbon fixation, nitrogen metabolism, amino acid synthesis, protein synthesis mechanics and regulation, water and solute utilization, nutrient translocation, photomorphogenesis and photoperiodism and growth hormones, considered at the fundamental level of operation.
PREREQ: PLSC201 or BISC208, and CHEM213.

PLSC 411  Diagnostic Plant Pathology  3
Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epidemiology, symptoms and control.
PREREQ: PLSC300

PLSC 413  Principles of Plant Disease Control  3
Principles of plant disease control by exclusion, eradication and resistance. Plant protection with emphasis on fungicides, bactericides, and nematicides and their use.
PREREQ: PLSC303

PLSC 414  Plant Cell and Tissue Culture  4
Principles of culturing plants in vitro. Topics for both lecture and laboratory include cell suspensions, anther culture, embryo rescue, micropropagation and regeneration via organogenesis and embryogenesis.
PREREQ: PLSC101

PLSC 415  Vascular Plant Anatomy  3
A developmental and comparative study of the cells, tissues and organs of vascular plants. Readings in the current anatomical literature.

PLSC 416  Plant Virology  4
Epidemiology, detection, identification and control of plant viruses and virus-like agents.
PREREQ: PLSC303
PLSC 417  GREENHOUSE MANAGEMENT  4
Greenhouse structures, environmental control, cultural techniques and general
management practices in greenhouse operations. Laboratory exercises supplement
lecture material.
PREREQ: PLSC201 and PLSC204.

PLSC 419  SOIL MICROBIOLOGY  4
Characterization of microorganisms and microbial habitats in soil environments
Processes and interactions involving soil microorganisms with respect to
growth and development of plants. Laboratory exercises supplement
lecture material.
PREREQ: PLSC201 and PLSC204.

PLSC 420  PLANT PHYSIOLOGY LABORATORY  2
The extraction from higher plants of enzymes and proteins, and assay by
chemical methods. Preparation of slides for microscopic examination.
PREREQ: PLSC201 and PLSC204.

PLSC 422  PLANT PROPAGATION  3
Practical and physiological aspects of the propagation of economic plants
including both sexual and asexual methods.
PREREQ: PLSC201 and PLSC204.

PLSC 429  INTRODUCTION TO THE FUNGI  4
Introduction to the terminology, structures, and classification of the fungi, through
the study of representative cultures and specimens. Fungi, mushrooms and molds
as food, in industry, plant pathology, and in human health and wellness. Practical
laboratory experience emphasized.
RESTRICTIONS: Requires permission of instructor.

PLSC 433  PLANT DEVELOPMENTAL BIOLOGY  3
An anatomical and molecular analysis of plant growth and development with a
focus on how genes regulate pattern formation and cellular differentiation.
PREREQ: PLSC300.

PLSC 438  FATE/TRANSPORT SOIL CONTAMINANTS  3
Fundamental concepts and mechanisms of contaminant fate and transport in
porous media. Includes an overview of soil and groundwater as resources; types
of soil and groundwater contaminants; transformation and attenuation of
contaminants; solute transport in saturated and unsaturated systems.
PREREQ: MATH121.

PLSC 440  INTEGRATED PEST AND DISEASE MANAGEMENT  3
See ENWC440 for course description.

PLSC 444  PHYSIOLOGY OF PLANT STRESS  3
Angiosperms’ response to biotic and abiotic environmental stresses; mineral
nutrients, salt, drought, cold, heat, light, pathogens and herbivores at the
physiological and molecular levels.
PREREQ: PLSC410.

PLSC 446  PLANT CELL BIOLOGY  3
See BISC446 for course description.
PREREQ: Introductory organic chemistry.

PLSC 450  PLANTING DESIGN  3
Comprehensive solution of landscape problems. Field application of principles
of construction and design.
PREREQ: PLSC211, PLSC212 and PLSC332.

PLSC 454  MANAGEMENT OF LANDSCAPE ENTERPRISES  4
How to establish and finance a landscape management business; how to hire,
supervise, evaluate, discipline and terminate personnel; how to manage time,
select equipment, construct bids and contracts and maintain landscaped areas
PREREQ: PLSC211 and PLSC212.

PLSC 455  ISSUES IN HORTICULTURE  3
An introduction to current and emerging issues facing the horticultural professions
Ethics, professionalism, environment, politics, horticultural technology and
practices will be the focus of discussion groups, student oral and written
presentations, case studies, guest lecturers and field trips.
RESTRICTIONS: Open to junior and senior majors only.

PLSC 461  SOILS AND WETLAND DELINEATION  4
Soil taxonomy, use of a soil survey, properties of hydric soils and wetland
delineation using soil characteristics, hydrology and plant ecological principles.
PREREQ: PLSC101, PLSC204 and PLSC205.

PLSC 465  SEMINAR  1
Oral and written reports in one of the fields of plant science.

PLSC 466  INDEPENDENT STUDY  1-6
PLSC 616  PLANT VIROLOGY  4
The epidemiology, detection, identification and control of plant viruses and virus-like agents.  
PREREQ: PLSC303

PLSC 619  SOIL MICROBIOLOGY  4
Characterization of microorganisms and microbial habitats in soil environments  
Processes and interactions involving soil microorganisms with respect to  
agricultural productivity and environmental quality.  
Introduction to laboratory techniques for the observation, enumeration and isolation of soil microorganisms,  
and measurement of associated activities.  
PREREQ: PLSC410

PLSC 620  PLANT PHYSIOLOGY LABORATORY  2
The extraction from higher plants of enzymes and other macromolecules, and  
assay by chemical tests.  
Pigment extraction, organelle separation, ion uptake, protein  
manipulation using centrifuge, spectrophotometer, chromatography and  
electrophoresis.  
COREQ: PLSC410

PLSC 629  INTRODUCTION TO THE FUNGI  4
Introduction to the terminology, structures, and classification of the fungi, through  
the study of representative cultures and specimens.  
Fungi, mushrooms and molds as food, in industry, plant pathology, and in human health and wellness.  
Practical laboratory experience emphasized.  
RESTRICTIONS: Requires permission of instructor.

PLSC 630  COLLECTIONS MANAGEMENT AND CURATION  3
Organization and maintenance of curatorial records including;  
plant records and labeling, organization of seed plants (phytogeny),  
nomenclature, policy statements and management concerns.  
COREQ: PLSC402

PLSC 635  PLANT DEVELOPMENTAL BIOLOGY  3
An anatomical and molecular analysis of plant growth and development with a  
focus on how genes regulate pattern formation and cellular differentiation.  
PREREQ: PLSC300

PLSC 640  INTEGRATED PEST AND DISEASE MANAGEMENT  3
See ENVC640 for course description.

PLSC 644  PHYSIOLOGY OF PLANT STRESS  3
Angiosperms' response to abiotic and biotic environmental stresses; mineral union:  
nutrients, salt, drought, cold, heat, light, pathogens and herbivores at the  
physiological and molecular levels.  
PREREQ: PLSC410

PLSC 666  PLANT CELL BIOLOGY  3
See BISC466 for course description.  
PREREQ: Introductory organic chemistry

PLSC 650  CLAY MINERALOGY  3
See MAST650 for course description.

PLSC 655  POLLUTION MICROBIOLOGY  3
Integration of basic chemical, physical and biological processes that affect  
biochemical transformation of organic and inorganic pollutants in soils and subsurface sediments.  
Organization is based on a progression from molecular to field scale processes.  
PREREQ: PLSC204, CHEM213, PLSC101 or BISC207

PLSC 660  PESTICIDES IN THE ENVIRONMENT  3
Roll of pesticides in agriculture and public health.  
Classification and environmental fate in soil, water and atmosphere.  
Management practices, non-target effect, detoxification of pesticide waste, risk assessment, regulation, impact  
of pesticide alternatives.  
PREREQ: CHEM102.

PLSC 670  WEEB BIOLOGY AND CONTROL  4
Introduction to weed science: weed biology and identification, survival strategies,  
competition, and impact of weeds.  
Weed management principles and practices including cultural, biological, and chemical control methods.  
PREREQ: PLSC101 or PLSC151 or PLSC204

PLSC 800  CURRENT TOPICS IN PLANT SCIENCE  1-3
Discussion of selected topics and recent literature in plant science.

PLSC 801  PLANT SCIENCE TECHNIQUES  3
Theories, principles and applications of laboratory techniques used in planning  
and conducting plant science research.  
RESTRICTIONS: Requires permission of instructor.

PLSC 802  PROFESSIONAL DEVELOPMENT  1
Professional development including grantmanship, manuscript writing and  
reviewing, resume preparation, job interviewing and presentation of research at  
professional meetings.

PLSC 803  ADVANCED SOIL FERTILITY AND PLANT NUTRITION  3
Analysis of chemical and biochemical factors involved in nutrient availability and  
transport in the soil.  Evaluation of current theories of ion uptake, translocation and  
assimilation.  
PREREQ: PLSC305 and PLSC410

PLSC 804  PLANT MOLECULAR BIOLOGY  3
Fundamental and applied aspects of plant molecular biology, including  
organization of plant genes, genomes, gene expression, gene transfer and  
genetic engineering.  
PREREQ: ANSC670 or BISC653

PLSC 805  INSECT-PLANT CHEMICAL ECOLOGY  2
See ENVC680 for course description.

PLSC 810  KINETICS AND SURFACE CHEMISTRY OF SOILS  3
Kinetics and mechanisms of soil chemical reactions, including application of  
chemical kinetics to natural systems, rates of sorption/desorption, redox,  
precipitation/dissolution, and ion exchange processes and application of surface  
spectroscopic and microscopic techniques to elucidate reactions at the soil  
mineral/water interface.  
May be cross-listed with CHEM10.

PLSC 819  ECOLOGICAL SOIL MICROBIOLOGY  3
Ecological principles of microbial activities and processes in soil/plant systems:  
dynamics of soil and rhizosphere populations, symbiotic interactions with plants,  
and selected topics in environmental quality.  
PREREQ: PLSC619

PLSC 823  SEMINAR: PRINCIPLES OF PLANT INFECTION  2
The basic factors governing the development of plant infection by  
phytopathogenic organisms: invasion, parasitism, colonization, dissemination,  
epidemiology and host-parasite relationships.  
RESTRICTIONS: Requires permission of instructor.

PLSC 831  TAXONOMY OF ORNAMENTAL PLANTS  3
Identification, considering the plant families that include the majority of the  
ornamental plants grown in botanic gardens, arboreta and horticultural  
institutions.

PLSC 832  BOTANIC GARDEN MANAGEMENT  1-10
A lecture and laboratory course conducted at Longwood Gardens to familiarize  
Longwood Fellows with the operations and purposes of all areas of Longwood  
Gardens and other botanic gardens.  
RESTRICTIONS: May be repeated for up to ten credits.

PLSC 833  SEMINAR: SOIL SCIENCE  1
Current topics in soil science will be discussed from the literature.

PLSC 834  CURRENT TOPICS IN AGRONOMY  1
Seminars to review current agronomic literature.

PLSC 835  ENVIRONMENTAL SOIL PHYSICS  4
Fundamentals of water, heat and solute transport in soil. Reactions and movement  
of organic/inorganic compounds in the soil environment.  Application of  
management models to solute transport.  
PREREQ: PLSC204 and MATH221

PLSC 864  SEMINAR PLANNING AND DEVELOPMENT  1 PF
Planning, developing and hosting a major seminar series: topic and speaker  
selection, format and schedule development, marketing, local arrangements and  
hosting.

PLSC 865  SEMINAR  1

PLSC 868  RESEARCH  1-9

PLSC 869  MASTER'S THESIS  1-6

PLSC 874  TOPICS IN MOLECULAR BIOLOGY  1
Provides a forum for the discussion of current topics in molecular biology, with  
critical reading of relevant primary literature.  
RESTRICTIONS: Requires permission of instructor.

PLSC 964  PRE-CANDIDACY STUDY  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying  
examinations for doctoral students before admission to candidacy but after  
completion of all required course work.  
RESTRICTIONS: Not open to students who have been admitted to candidacy.

PLSC 969  DOCTORAL DISSERTATION  1-12 PF
INTRODUCTION TO POLITICAL SCIENCE

POSC 100 INTRODUCTION TO POLITICAL SCIENCE 3
Introduction to the study of central concepts of the discipline, such as political power, authority, decision making, conflict management, representation and institutions of government.

POSC 102 CIVICS AND ECONOMICS FOR TEACHERS 3
See HEPP102 for course description.
RESTRICTIONS: Elementary teacher education majors only

POSC 150 AMERICAN POLITICAL SYSTEM 3
Constitutional principles, structure and functions of the political process in the United States.

POSC 151 EXPLORING AMERICAN POLITICS 1
Analysis of an array of problems in American government and politics. Individual and group participation expected.
CORREO: POSC150
RESTRICTIONS: Students cannot take both POSC202 and POSC300 for credit

POSC 201 INTRODUCTION TO POLITICS IN DEVELOPING COUNTRIES 3
Forces affecting politics in emerging nations. Impact of colonialism, economic development, military rule, instability and environment. Discussion of how developing nations affect the world political system.
RESTRICTIONS: Only one of either POSC211 or POSC311 can count for degree credit

POSC 210 INTRODUCTION TO PUBLIC POLICY 3
Emphasis on what government does, with a focus on substantive policy areas as well as the mechanisms of policy making. Case studies of policy areas (e.g., health policy, environmental policy, social welfare policy, etc.) used to illustrate processes of agenda-setting, decision making and policy implementation.

POSC 240 INTRODUCTION TO INTERNATIONAL RELATIONS 3
The development of international systems, their structure and political economic dynamics. Fundamental analytical concepts and approaches

POSC 266 SPECIAL PROGRAM 1-3
Introduction to comparison of politics "within nations". Covers Europe, Africa, Asia and Latin America

POSC 270 COMPARATIVE POLITICS 3
Basic introduction to political philosophy, organized around particular historical periods or specific philosophers, but nothing most of the most, enduring questions of political theory. What is the nature of the state? What are the obligations and responsibilities of citizens?

POSC 300 DATA ANALYSIS FOR POLITICAL SCIENCE 3
Applied statistical analysis, including regression, analysis of variance, descriptive statistics and exploratory data analysis, statistical inference, and measurement

POSC 301 STATE AND LOCAL GOVERNMENT 3
American federalism with emphasis on government and politics, with special attention to Delaware

POSC 302 PUBLIC ADMINISTRATION 3
Introduction to management in the public sector; personnel, budgeting, leadership, ethics, and the role of civil service in government

POSC 305 ECONOMIC THEORIES OF POLITICS 3
See ECON306 for course description

POSC 309 POLITICAL CULTURE BY COUNTRY 3
Introduction to the political and civic cultures underpinning and supporting different political systems. Topics may vary depending on host country.
May be cross-listed with FLU309
RESTRICTIONS: Offered only in conjunction with travel abroad programs. May be repeated for credit when topics vary

POSC 310 EUROPEAN GOVERNMENTS 3
Structure and process of British, French, West German and Russian governments.

POSC 311 POLITICS OF DEVELOPING NATIONS 3
Forces determining public policy among the emerging nations. Cross-national comparative analysis.
RESTRICTIONS: Only one of either POSC211 or POSC311 can count for degree credit

POSC 312 POLITICS OF EAST ASIAN DEVELOPMENT 3
Examines contemporary issues and questions of political legitimacy and economic development in East and Southeast Asia. Traditional patterns of authority, impact of Western colonialism, emergence of new Southeast Asian states and the political and economic development of selected countries are covered.

POSC 313 AMERICAN FOREIGN POLICY 3
The theory, policies and administration of U.S. foreign policy.

POSC 315 THIRD WORLD WOMEN IN POLITICS 3
Introduction to the role of women in politics and society in Africa, Asia, Latin America and the Middle East.
May be cross-listed with WOMS315.

POSC 316 INTERNATIONAL POLITICAL ECONOMY 3
Interaction of international political and economic phenomena, considered history and development of political economy, and the political underpinnings and effects of global monetary, trade, financial and investment systems. Both relations among advanced countries, and between the advanced and poor countries will be considered.

POSC 319 TOPICS IN POLITICS AND BROADCAST JOURNALISM 3
See COM319 for course description

POSC 320 PARTIES AND INTEREST GROUPS 3
Organization and behavior of political parties and interest groups, including structure, leadership, recruitment and decision making

POSC 321 CLASS, ETHNICITY AND POLITICS 3
Examines the history, strategic positions and political tactics of cultural and ethnic minorities in the U.S. Where appropriate, the politics of cultural and ethnic minorities will be compared to that of racial minorities. Attention also given to social class as a factor influencing politics in the U.S.

POSC 322 RACE AND POLITICS 3
Provides a focused and understanding of African American poliitics and social psychological issues of political participation and the political process in the U.S. The role of race in U.S. politics is explored primarily through the political experiences of Black Americans and how the political system has responded.
May be cross-listed with BAMS322.
POSC 323  INTRODUCTION TO WOMEN AND POLITICS  
Political-legal status of American women since the Revolution, and their participation in the political process. Women's present political-legal status, as illustrated through current issues such as reproductive rights, pay equity and the feminization of poverty. May be cross-listed with WOMS323

POSC 324  VOTING AND ELECTIONS  
Examines various aspects of political behavior including political socialization, the formation of political attitudes and opinion, electoral behavior and political participation. Attention also given to the relationship of political behavior and public policy

POSC 329  INTERNATIONAL MIGRATION  
This interdisciplinary course introduces alternative/complementary disciplinary approaches to the study of human movement between states. It is offered on a rotational basis by faculty involved in the University of Delaware migration group. May be cross-listed with GEOG329, HIST329, and/or SOC329

POSC 330  POLITICAL TERRORISM  
Selectively examines cases, trends and organizations which have made the violence termed terrorism so salient. Also examines whether governments, including the U.S., are responding appropriately to the challenge

RESTRICTIONS: Not open to freshmen except with consent of instructor

POSC 333  CONTEMPORARY POLITICAL IDEOLOGIES  
Considers the theoretical development of liberal democracy and significant theoretical and ideological challenges to its dominance including Marxist, Islamist, postcolonial and postmodern political theories. Students read the original sources of these positions while considering their historical development and application to contemporary politics

POSC 334  LIBERALISM AND CONSERVATISM  
Introduces classical, liberalism, conservatism, and democratic forms of Marxism. Accents problems of economic growth, equality, freedom and self-realization, bureaucracy, representation, justice, brotherhood, the profit motive, social cohesion, nationalism and the international order

POSC 339  BRITAIN AND EUROPE  
Examines Britain's role in an integrated Europe, with focus on contemporary problems and prospects of closer British ties to the European Union and related bodies

POSC 340  POLITICAL AND THE MEDIA  
Political roles of the media in socialization, political competence, agenda setting, the electoral process and political crises. Emphasis on media-political system interaction and its impact in a democratic society. May be cross-listed with COMM400

POSC 341  ENVIRONMENT OF MULTINATIONAL CORPORATIONS  
See BUAD341 for course description

POSC 343  SOCIETY, POLITICS AND HEALTHCARE  
Interdisciplinary study of the social, economic and humanistic issues of healthcare and health policy. Students will develop the capacity to understand the political process and its relationship to the healthcare delivery system. May be cross-listed with CSCC343 and/or SOC343.

POSC 350  POLITICS AND THE ENVIRONMENT  
The political context of environmental issues; air and water pollution, population control, and conservation

POSC 355  URBAN POLITICS AND COMMUNITY DEVELOPMENT  
Examines the decision making processes and the exercise of political power in urban communities. Special focus placed on urban politics and government and the impact of social and economic problems on the development of urban society. Explores the concepts and practices of community development in urban communities

POSC 360  HUMANITIES COLLOQUIUM  
See ASRC360 for course description

POSC 362  DIPLOMACY  
Diplomacy is the art of formal representation and policy implementation. Diplomats need to understand complex material and represent positions in an effective manner. These skills are applicable in a variety of contexts. Readings, discussions, cases and simulations are used to introduce diplomatic skills.

POSC 363  INTERNATIONAL LAW AND ORGANIZATION  
Introduction to the development of international law and international organization

POSC 366  INDEPENDENT STUDY  1-6

POSC 372  EAST CENTRAL EUROPEAN POLITICS  
Survey of East Central European political systems (Poland, Hungary, Czechia and Slovakia, Germany, Romania, former Yugoslavia, Bulgaria and Albania) after World War II. The so-called new federal states in Germany (ex-DDR) will be emphasized

POSC 377  ARAB-ISRAELI POLITICS  
Development of the Arab-Israeli conflict analyzed from the Dreyfus Affair and the Balfour Declaration to current events. May be cross-listed with JWST377

POSC 380  INTRODUCTION TO LAW  
Broad overview of the nature, functions and limits of law. Emphasis on law as the political instrument used to regulate, control and promote behavior and deal with social problems. May be cross-listed with JEST380

POSC 387  AMERICAN POLITICAL THOUGHT  
Overview of American political thought. Focuses on critical formative periods in American politics, such as the Founding, Civil War and Industrial Revolution, with readings selected from the writings and speeches of key American statesmen.

POSC 390  HONORS COLLOQUIUM  
See ASRC390 for description

POSC 400  PRACTICUM IN TEACHING POLITICAL SCIENCE  3 PF
Available to outstanding Senior political science majors interested in obtaining teaching experience at the college level. Provides opportunity to lead discussion sections of students in lower division courses.

RESTRICTIONS: Requires permission of instructor

POSC 401  TOPICS IN CONSTITUTIONAL LAW  3 Critical topics of constitutional law. Topics vary by instructor. May be cross-listed with WOMS402

RESTRICTIONS: May be repeated for credit when topics vary

POSC 402  CIVIL LIBERTIES: INDIVIDUAL FREEDOMS  3 Constitutional issues of freedom of speech, press, religion, and separation of church and state

POSC 403  CIVIL LIBERTIES: EQUAL PROTECTION CLAUSE  3 Focuses on fundamental rights and the constitutional guarantee of equal protection of the laws

POSC 404  THE JUDICIAL PROCESS  3 Structure, process and personnel of American courts; factors influencing decisions and judicial policy making

POSC 405  CONSTITUTIONAL LAW OF THE UNITED STATES  3 Constitutional principles regulating organization and function of federal government. United States Supreme Court decisions placed in a socio-political context.

POSC 407  AMERICAN PRESIDENCY  3 Modern American presidency with emphasis on presidential recruitment, organization and staffing. The nature and exercise of presidential power in the decision making process.

POSC 408  INTERNATIONAL ORGANIZATION  3 Analysis of the organization of the international system, its structure, operating principles, formal and informal components

POSC 409  CONTEMPORARY PROBLEMS OF WORLD POLITICS  3 Critical areas of international politics. Topics vary by instructor. May be cross-listed with JWST409

RESTRICTIONS: May be repeated once when topics vary

POSC 411  POLITICS AND POVERTY  3 Relationship of policy making and social conditions in the United States with regard to capacity of government to cope with problems arising from overpopulation and socio-economic differences

POSC 412  FOREIGN POLICY OF THE POST-SOVET UNION  3 Principles, foreign policies and administration of the former Soviet government and its most important successor states

POSC 413  PROBLEMS IN AMERICAN GOVERNMENT  3 Contemporary problems in American government and politics. May be cross-listed with WOMS413

RESTRICTIONS: May be repeated for credit once when topics vary

POSC 414  PROBLEMS IN AMERICAN FOREIGN POLICY  3 Contemporary problems in American foreign policy and policy making. May be cross-listed with LEST414

RESTRICTIONS: May be repeated for credit once when topics vary

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POSC 415  FORCE AND WORLD POLITICS  3
Interrelationship of military and foreign policy; military strategies, arms control
and disarmament; and the American experience

POSC 418  CONSTITUTIONAL ISSUES IN AMERICAN PUBLIC SCHOOLS  3
Case studies are used to explore how controversial issues have arisen in public
education over the years, what laws and legal precedents presently govern them,
how policies have evolved over time and what questions remain unsolved.

POSC 419  HUMAN ROLE IN ENVIRONMENTAL CHANGE  3
Examines the impact that human activity has on earth systems and how the
behavior of earth systems affects human activity. Topics include climate change,
biodiversity, conservation, western water management and industrial ecology.
Offered only in partnership with the Biosphere 2 Center in Arizona.

POSC 420  INTRODUCTION TO POLITICAL ECONOMY  3
Recent political and economic history, contemporary economic policy disputes
and an analysis of how the Democratic-Republican balance of power affects, and
is affected by, changing economic conditions and the results of policies put into
effect.

POSC 422  POLITICAL LEADERSHIP  3
Study of the theories and practices of effective political leadership in both
contemporary and historical contexts. Will include case materials and may
include non-U.S. cases for study.

POSC 423  CONGRESS AND PUBLIC POLICY  3
Democratic functions of a modern legislature; legislative structures and processes;
coalitions and cleavages; parties, ideological factions and interest groups; the
Federal budget, national priorities and Congressional intervention in the
economy; central policy issues before Congress; Congressional oversight of the
bureaucracy; Congress and the Presidency; and election of the Congress.

POSC 424  ENERGY POLICY AND ADMINISTRATION  3
World and U.S. energy policies with emphasis on nuclear power, solar energy
and fossil fuels. Analyzes progress and design of U.S. science and technology
policy in energy domain.

POSC 425  ADVANCED TOPICS IN POLITICS AND BROADCAST JOURNALISM  3
See COMM 425 for course description.

POSC 426  LATIN AMERICAN POLITICAL SYSTEMS  3
Impact of social and economic change on the political processes

POSC 427  POLITICS IN CHINA  3
General introduction to politics of the People’s Republic of China, including
examination of politics and modernization efforts under Mao Zedong and Deng
Xiaoping and legacies left by both. Significance of Tiananmen, dilemmas of
economic and political liberalization, regionalization, and future of Communist
Party also discussed.

POSC 428  POLITICS IN JAPAN  3
An in-depth study of who governs Japan and how these relations have evolved
since the end of World War II

POSC 429  SOUTHEAST ASIA AND THE WORLD  3
Examines patterns of international relations within Southeast Asia and between
the region and greater powers, Southeast Asia’s insecurity and patterns of
relations at the domestic, regional and global levels. Discussion of contemporary
issues including the emergence of economic blocs, the rise of China and the
future of the Association of Southeast Asian Nations.

POSC 431  LATIN AMERICAN POLITICS: COUNTRIES  3
Contemporary political events in three Latin American settings: modern,
transitional and traditional.

POSC 432  POLITICAL SYSTEM OF THE POST-SOVET UNION  3
Structure and process of the political system of the USSR and its most important
successor states (Russia, Ukraine, Byelorussia, Kazakhstan and others).

POSC 433  AFRICAN POLITICS  3
Overview of politics and society in sub-Saharan Africa including: colonialism, the
rise of nationalism, decolonization, single-party and military rule, the role of
social movements and religious, class, gender and ethnic identities and the move
toward economic and political liberalization.

POSC 434  POLITICAL THOUGHT I  3
From Plato to Machiavelli

POSC 435  POLITICAL THOUGHT II  3
From Machiavelli to present

POSC 436  POLITICS AND LITERATURE  3
Class, civil rights, feminism, revolution and other political issues examined through
novels, films and other literary works. May be cross-listed with FLTV 436 and/or WOMS 436.

POSC 437  WHO GOVERNS: PERSPECTIVES ON POLITICAL POWER  3
Examines the question “Who Governs” and attempts to answer it by critically
examining various schools of thought about who actually has and who should
have political power in capitalist countries.

POSC 439  PROBLEMS IN AFRICAN POLITICS  3
Examines selected topics in contemporary African politics. Will focus in-depth
on aspects of politics and society in a specific region of Africa or will investigate in
greater detail issues confronting Africa today such as economic structural
adjustment, democratization and state-society relations. May be cross-listed with
BAMS 439.

POSC 441  PROBLEMS OF WESTERN EUROPEAN POLITICS BY COUNTRY  3
Intensive examination of European politics from the perspective of a specific
country, e.g., Spain, England and France.

POSC 442  PROBLEMS OF WESTERN EUROPEAN POLITICS  3
Examines of current political trends in Western European politics, including
changes in party systems and problems of European integration.

POSC 443  CHINA AND THE WORLD  3
An historical and theoretical examination of Chinese foreign policy since 1949,
including discussion of China’s relations with larger and developing powers,
China’s historical conception of itself in the world, significance of China’s
interdependence with the world and China’s participation in international and
regional organizations.

POSC 444  GLOBAL AGENDA  3
Seminar survey of current geopolitical problems facing the US government and
global news media. Guest lecturers and practitioners in diplomacy and the
international media explore the problems. US foreign policy and media influence
upon both may be cross-listed with COMM 444. Restrictions: May be repeated for credit when topics vary.

POSC 445  HUMAN RIGHTS AND WORLD POLITICS  3
Alternative theories of human rights examined in cross-cultural and international
contexts. International documents, contemporary cases (e.g. South Africa) and
US foreign policies also examined and evaluated.

POSC 446  INTERNATIONAL HUMAN RIGHTS ON FILM  3
Analysis of the history, evolution and current status of universal human rights using
film as a primary medium. Content covers origins of the international human
rights movement during and after WWII. A series of feature films and documentaries also highlights recent and current human rights violations in foreign
countries.

POSC 448  THEORIES OF INTERNATIONAL RELATIONS  3
Surveys the theoretical debates regarding how we can conceive of and
understand world politics, as well as how we can evaluate competing
perspectives. Considers such schools of thought as ancient, idealist, realist,
behavioralist, interdependence, radical, neo-realist and post-structuralist
perspectives.

POSC 450  PROBLEMS OF LATIN AMERICAN POLITICS  3
A study of the history, evolution and current status of universal human rights using
films as a primary medium. Content covers origins of the international human
right movement during and after WWII. A series of feature films and
documentaries also highlights recent and current human rights violations in foreign
countries.

POSC 452  PROBLEMS IN URBAN POLITICS  3
Contemporary problems and political relationships in urban communities.
May be cross-listed with JWS 452.

POSC 453  PUBLIC SECTOR HUMAN RESOURCE MANAGEMENT  3
Recruitment, selection, training, performance assessment and pay issues in public
personnel administration.

POSC 454  ORGANIZATIONAL BEHAVIOR AND THEORY IN THE PUBLIC
SECTOR  3
Examines major administrative and organizational theories ranging from
Weberian bureaucracy to organizational humanism as applied to public
organizations. Explores various aspects of behavior in the public organizational
settings through analysis of individuals, groups and the organizations as a whole.

POSC 455  PUBLIC BUDGETING AND FINANCIAL MANAGEMENT  3
Revenue and expenditure systems, alternative budget formats, basic principles of
accounting and capital financing in the public sector.
POSC 456 Disaster and Politics 3
U.S. emergency management and disaster policy examined through books, articles and video tapes dealing with governmental preparedness for, and response to, natural and human-caused disasters and emergency incidents.

POSC 457 Management and Nonprofit Organizations 3
Explores the historical and theoretical context of nonprofit organizations. Discusses how nonprofit organizations are organized and structured in the pursuit of their mission. Designed to prepare students for a career as an administrator in a nonprofit organization.

POSC 458 Community Service Fieldwork 3
Allows students to earn academic credit for fieldwork experiences in public or private community service agencies. Students will share and analyze experiences in a seminar setting with academic requirements. RESTRICTIONS: May be repeated for credit once when topics vary.

POSC 463 The United Nations and World Affairs 3
Examines the development, institutional structure, and prospects of the United Nations and UN system.

POSC 464 Internship in Political Science 1–6
Internship in a political science or international relations-related field. Includes preparation of a journal of activities and a final project. RESTRICTIONS: Requires permission of instructor.

POSC 465 Model Organization of American States 3
Theoretical and practical preparation for participation in the Model Organization of American States conference held in Washington, D.C. each year. Participation as delegates to the week-long simulation. RESTRICTIONS: May be repeated once for credit when topics vary. May only count toward political science or international relations major one time.

POSC 466 Independent Study 1–6
Research conducted under the direction of or in conjunction with a faculty member. May result in a major research paper or be incorporated into a faculty project.

POSC 470 Senior Honors Seminar 3

POSC 475 Model United Nations 3
Intensive preparation for effective participation in the National Model United Nations held in New York City each spring. RESTRICTIONS: May be repeated once for credit when topics vary. May only count toward political science or international relations major one time.

POSC 499 Capstone in Political Science 1
Designed to integrate students' acquired knowledge and skills in political science. Emphasizes analytical, written and oral communication skills. RESTRICTIONS: Offered in conjunction with a 400-level political science course.

POSC 604 International Law 3
See MAST673 for course description.

POSC 605 Topics in Law and Courts 3
Content of this research seminar will vary from year to year. Possible topics may be comparative public law, jurisprudence, constitutionalism. A major research paper is required.

POSC 612 Foreign Policy of the Post-Soviet Union 3
Principles, foreign policies and administration of the former Soviet government and its most important successor states.

POSC 614 Judicial Process 3
Examines the structure, personnel, and process of the American judiciary, including factors that influence judicial decisions and the scope and nature of judicial policy making.

POSC 615 Force and World Politics 3
Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.

POSC 624 Energy Policy and Administration 3
World and U.S. energy policies with emphasis on nuclear power, solar energy and fossil fuels. Analyzes progress and design of U.S. science and technology policy in energy domain. May be cross-listed with MAST620 and/or UAPP625.

POSC 626 Conservation and Renewable Energy Policy 3
See UAPP626 for course description.

POSC 627 Latin American Political Systems 3
Impact of social and economic change on the political processes.

POSC 628 Comparative Environmental Politics 3
See UAPP627 for course description.

POSC 629 Southeast Asia and the World 3
Examines patterns of international relations within Southeast Asia and between the region and greater powers, Southeast Asia's insecurity and patterns of relations at the domestic, regional and global levels. Discussion of contemporary issues including the emergence of economic blocs, the rise of China and the future of the Association of Southeast Asian Nations.

POSC 632 Political System of the Post-Soviet Union 3
Structure and process of the political system of the USSR and its most important successor states (Russia, Ukraine, Byelarus, Kazakhstan and others).

POSC 633 African Politics 3
Overview of politics and society in sub-Saharan Africa including colonialism, the rise of nationalism, decolonization, single-party and military rule, the role of social movements and religious, class, gender and ethnic identities and the move toward economic and political liberalization.

POSC 634 Political Thought I 3
An in-depth study of major political philosophers of the Western tradition from Plato to Machiavelli.

POSC 635 Political Thought II 3
An in-depth study of major political philosophers of the Western tradition from Machiavelli to the present.

POSC 639 Problems in African Politics 3
Examination of selected topics in contemporary African politics. Will focus in depth on aspects of politics and society in a specific region of Africa or will investigate in greater detail issues confronting Africa today such as economic structural adjustment, democratization and state-society relations.

POSC 640 International Development Policy and Administration 3
Poverty and inequality in developing countries and the economic development policies employed to alleviate them. Emphasis on policy reform, trade strategies, sustainable development, and the role of the state. The approaches used by the World Bank, the IMF and USAID. May be cross-listed with UAPP640.

POSC 642 Problems of Western European Politics 3
Examination of current political trends in Western European politics, including changes in party systems and problems of European integration.

POSC 650 Problems of Latin American Politics 3
Current political issues in selected Latin American countries.

POSC 652 Topics in Political Theory 3
Focuses on selected topics in political theory, including Marxism, Liberalism and Contemporary Political Theory.

POSC 653 Politics and Healthcare 3
Prepares students to understand and assess the American healthcare delivery system. Examines the political dynamics involved in developing healthcare policies in both the public and private sectors. May be cross-listed with UAPP653.

POSC 656 Politics and Disaster 3
The politics and public administration of governmental preparedness for, and response to, natural and human-caused disasters and emergency incidents. May be cross-listed with UAPP656.

POSC 659 Topics in Public Administration 1–3
See UAPP659 for course description.

POSC 663 Decision Tools for Policy Analysis 3
See MAST663 for course description.

POSC 678 Admiralty and Maritime Law 3
See MAST678 for course description.

POSC 679 Shipping and Port Management 3
See MAST679 for course description.

POSC 681 Metropolitan Infrastructure and Transportation 3
See UAPP681 for course description.

POSC 683 Regional Policy Analysis 3
See UAPP683 for course description.

POSC 685 Personnel and Human Resource Issues/Current Topics 3
See UAPP685 for course description.

POSC 686 State and Local Government 3
See UAPP686 for course description.
POSC 687  STATE GOVERNMENT MANAGEMENT AND POLICY  3
See UAPP687 for course description.

POSC 688  TOPICS IN STATE AND LOCAL MANAGEMENT  3
See UAPP688 for course description.

POSC 800  SEMINAR: THEORIES OF POLITICAL INQUIRY  3
Introduces basic topics of political inquiry including philosophies of science, epistemologies and theory building, and research design.Conceptual and normative issues are explored.

POSC 801  RESEARCH DESIGN FOR POLITICAL SCIENCE  3
Seminar helps students understand and evaluate alternative research methods and research design. Each participant has an opportunity to write a research proposal that is then critiqued by members of the class and the instructor.

POSC 802  SEMINAR: DEVELOPING AND TRANSITIONAL SYSTEMS  3
Issues, concepts, and scholarship regarding the politics of the developing and transitional countries of Africa, Asia, Eastern Europe and Latin America in a global governance context. Topics may include democratic transition and consolidation, comparative democracy, political economy of liberal economic reform, religion and political culture, new nationalism and ethnic conflict, and international systemic influences on all the above.

POSC 803  SEMINAR: PUBLIC ADMINISTRATION  3
See UAPP803 for course description.

POSC 804  SEMINAR: POST-INDUSTRIAL SYSTEMS  3
Issues, concepts, and scholarship regarding the politics of advanced industrial nations of Europe, North America and East Asia in a global governance context. Topics may include state theory and the new institutionalism, political culture and nationalism, the welfare state and reform, party systems, civil society and new social movements, regional integration and transnational dimensions of policy processes.

POSC 805  SEMINAR: PUBLIC LAW  3
Core seminar for the field of law and courts. Provides a broad overview of the range, depth and variety of approaches of current research within this field.

RESTRICTIONS: Graduate students only.

POSC 806  SEMINAR: NORMATIVE ISSUES IN GLOBAL GOVERNANCE  3
Examines normative issues in contemporary global governance from perspective of diverse ethical traditions and/or political philosophy.

POSC 807  SEMINAR: AMERICAN POLITICAL INSTITUTIONS  3
Explores major themes, viewpoints, issues and topics pertaining to the American political system. Themes include stability, change, conflict, American exceptionalism, American political thought, alternative perspectives on democracy, analysis of political parties, interest groups, Congress, the presidency and the courts.

POSC 808  SEMINAR: COMPARATIVE GOVERNMENT  3
Focuses on the evolution of the study of politics within national states, the principal theoretical approaches in studying politics cross-nationally and major scholarly controversies. Students review a broad spectrum of comparative research and writing.

POSC 811  SEMINAR: TOPICS IN COMPARATIVE GOVERNMENT  3
Focuses on selected topics in Comparative Government and Politics.

POSC 813  SEMINAR: AMERICAN FOREIGN POLICY  3
Overview of contemporary American foreign policy and policy making, as well as the analytical, conceptual and methodological problems associated with foreign policy analysis.

POSC 814  SEMINAR: POLITICAL ECONOMY OF THE ENVIRONMENT  3
See UAPP810 for course description.

POSC 815  SEMINAR: INTRODUCTION TO STATISTICAL ANALYSIS FOR POLITICAL SCIENCE  3
Training in the basics of statistical analysis and quantitative approaches to politics and society. Topics include elementary statistics, probability theory, hypothesis testing and regression analysis. Provides foundation for further quantitative methods.

POSC 816  SEMINAR: ADVANCED SOCIAL RESEARCH FOR POLITICAL SCIENCE  3
Provides advanced training in applied social research methods. Topics may include econometrics, qualitative methods, game theory, and agent-based modeling. Includes lectures and discussion supplemented by laboratory work involving computer statistical packages and simulations.

POSC 817  SEMINAR: FINANCING ALTERNATIVES IN THE PUBLIC SECTOR  3
See UAPP817 for course description.

POSC 818  SEMINAR: ENVIRONMENTAL POLICY AND ADMINISTRATION  3
U.S. and international environmental policies, politics, laws, and agreements regarding air, water, and natural resource protection. Examines environmental governance regimes, politics and science, theories of environmental policy, public and private interaction, and epistemic communities in global warming, ozone layer protection, environmental public health, etc. May be cross-listed with MAST871 and/or UAPP818.

POSC 819  SEMINAR: MANAGEMENT DECISION MAKING IN PUBLIC AND NONPROFIT SECTORS  3
See UAPP819 for course description.

POSC 820  SEMINAR: INTERNATIONAL PERSPECTIVES ON ENERGY AND ENVIRONMENT  3
Policy analysis and political economy at international energy and environmental issues and problems. Encompasses international and multi-national government and private sector organizations, as well as non-governmental, non-profit organizations. May be cross-listed with UAPP820.

POSC 821  SEMINAR: TECHNOLOGY, ENVIRONMENT AND SOCIETY  3
See UAPP821 for course description.

POSC 825  SEMINAR: COMPARATIVE PUBLIC ADMINISTRATION  3
A reading and discussion seminar concentrating on the development of administrative and bureaucratic elites in developed and developing countries. Attention given to French, British and German bureaucracies and the problems of ethics, decentralization, planning, political influences and external controls. May be cross-listed with UAPP825.

POSC 829  SEMINAR: TAXATION AND FISCAL POLICY  3
See UAPP829 for course description.

POSC 830  SEMINAR: INTERNATIONAL RELATIONS  3
Surveys broad range of international relations theory including realism, neo-realism, interdependence, unit-level analysis, regime theory, world system theories, post-structuralism, feminism and normative theory. Epistemological and conceptual problems associated with international relations research are explored.

POSC 833  SEMINAR: NORMATIVE POLITICAL THEORY  3
Department's core seminar in political philosophy which attempts to acquaint the student with major themes in political thought from Plato to the present. Within that framework there is normally emphasis placed on the thought of one or two individuals.

POSC 835  SEMINAR: ORGANIZATION AND MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
See UAPP835 for course description.

POSC 837  SEMINAR: HUMAN RESOURCES MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
See UAPP837 for course description.

POSC 838  SEMINAR: PUBLIC POLICY ANALYSIS  3
Seminar covers an overview of the policy process and considers all topics central to an understanding of policy making in the United States. May be cross-listed with MAST838 and/or UAPP838.

POSC 839  SEMINAR: FINANCIAL MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
See UAPP833 for course description.

POSC 840  SEMINAR: INTERNATIONAL POLITICAL ECONOMY  3
Considers the political underpinnings and effects of the interaction of political and economic processes at the global level. Reviews schools of thought and various topics including long cycles, foreign investment, monetary and trade regimes, and the political dilemmas of growth and stagnation.

POSC 842  SEMINAR: INTERNATIONAL ORGANIZATION  3
Introduction to theories of international organization. Focuses on the organization and governance of the international system. Areas of inquiry include the role of norms in structuring interactions in world politics, international regimes, formal international organization and international law.

POSC 843  SEMINAR: GLOBAL GOVERNANCE: THEORY AND CASES  3
Exploration of international organization, regime and global governance theory. Analysis of global governance arrangements in various issue areas such as the environment, ocean issues, human rights, development, world health, telecommunications, trade and finance. May be cross-listed with MAST843 and/or UAPP843.

POSC 844  SEMINAR: INTERNATIONAL SECURITY  3
An introduction to the theoretical, empirical and policy-relevant literatures connected with international security affairs, defined as issues connected with the use or threat of force in international affairs. Topics include nuclear deterrence and proliferation, grand strategy, ethnic violence, peacekeeping, and terrorism and counterterrorism.
PSY 100  GENERAL PSYCHOLOGY
Provides foundation in the application of the scientific method to problems of human behavior and experience

PSYC 207  RESEARCH METHODS
Reviews the major issues involved in the design of psychological experiments. Includes measurement issues, internal and external validity of experiments, research with single subjects, and research ethics. Discusses both laboratory and field research
PREREQ: PSYC100
RESTRICTIONS: Majors and minors only

PSYC 209  MEASUREMENT AND STATISTICS
Theory and the application of statistical techniques to psychological data.
PREREQ: PSYC100 and one course in basic college mathematics
RESTRICTIONS: Majors and minors only

PSYC 270  FAMILIES AND DEVELOPMENTAL DISABILITIES
See PSY270 for course description

PSYC 301  PERSONALITY
A survey of data and theories of human personality and affect
PREREQ: PSYC100

PSYC 303  INTRODUCTION TO SOCIAL PSYCHOLOGY
Analysis of interpersonal behavior with special emphasis on problems of conformity and influence; the organization and dynamics of social groups; and the development of opinions and attitudes
PREREQ: PSYC100

PSYC 310  SENSATION AND PERCEPTION
Theories and experimental study of sensation and perception
PREREQ: PSYC207 and PSYC209

PSYC 312  LEARNING AND MOTIVATION
Experimental study of contemporary theories of learning and motivation
PREREQ: PSYC207 and PSYC209

PSYC 314  BRAIN AND BEHAVIOR
Study of the brain mechanisms underlying hunger, sex, aggression, learning, memory, perception, sleep and walking
May be cross-listed with CGSC314
PREREQ: PSYC207 and PSYC209

PSYC 316  BIOLOGICAL BASIS OF BEHAVIOR
An evolutionary approach towards three modern theories of motivation: ethologists' instinct theory, psychoanalytic theory, and drive theory. Topics include circadian rhythms, obesity and anorexia, sleep, fever, phobias, helplessness, depression, feart, love, and aggression
PREREQ: PSYC207 and PSYC209

PSYC 320  INTRODUCTION TO NEUROSCIENCE
Survey of the basic sciences of the brain [neuroanatomy, neurophysiology, neuropharmacology], building on these principles to examine the neurobiological bases of a variety of phenomena, including perception and cognition, memory and amnesia, fear and aggression, and the pharmacokinetics of several mental disorders
PREREQ: PSYC207 and PSYC209

PSYC 325  CHILD PSYCHOLOGY
Survey of the interactions of physiological, psychological, and environmental factors determining psychological development. Consideration of major theories of child development
PREREQ: PSYC100

PSYC 333  PSYCHOLOGY OF WOMEN
Psychological analysis of the meaning and implications of being a woman and cause and consequences of the female experience. Biological sex vs. psychological sex role, identity, stereotyping, discrimination, self-concept, the feminist perspective
May be cross-listed with WMS333
PREREQ: PSYC100

PSYC 334  ABNORMAL PSYCHOLOGY
Disorders of behavior and consciousness including the various psychoses, psychoneuroses, mental deficiency, and other conditions
PREREQ: PSYC100

PSYC 340  COGNITION
Survey of major themes in human thought processes, concept formation, problem solving, creativity, language usage and cognitive development
May be cross-listed with CGSC340
PREREQ: PSYC207 and PSYC209

PSYC 344  PSYCHOLOGY OF LANGUAGE
Describes the nature of human language, how it is used to speak and comprehend, and how it is learned. Subtopics include language and thought, animal communication, and language in special populations, such as children born deaf or blind
PREREQ: PSYC207 and PSYC209

PSYC 346  PSYCHOLOGY AND THE LAW
See CRJU346 for course description

PSYC 350  DEVELOPMENTAL PSYCHOLOGY
An analysis of theory and research in developmental psychology including the topics of developmental processes, developmental risk, systems theory and contemporary social issues
PREREQ: PSYC207 and PSYC209
RESTRICTIONS: If both PSYC325 and PSYC350 are taken, only PSYC325 will count for major credit. Open to psychology majors and minors only

PSYC 365  PSYCHOLOGY FIELD PLACEMENT
Student contracts with any psychology instructor. Requirements include a minimum of four hours per week working in an agency, institution or business, reading assignments, and writing a term paper. Placement will be made with assistance from Career Planning and Placement. Inquiries should be made several months in advance
PREREQ: PSYC207 and PSYC209

PSYC 366  INDEPENDENT STUDY
1-6

PSYC 370  RESEARCH IN PERSONALITY
An analysis of contemporary issues and research in personality including the assessment of personality traits, the personality situation interaction and the social and biological bases of individual differences
PREREQ: PSYC207 and PSYC209
RESTRICTIONS: If both PSYC301 and PSYC370 are taken, only PSYC301 will count for major credit. Open to psychology majors and minors only

PSYC 380  PSYCHOPHARMACOLOGY
Exploration of research on diagnosis, etiology and treatment of major pathological disorders. Emphasis on original research articles, class discussion and assessment instruments. In addition to presentation of videotaped interviews with patients used to illustrate the disorders
PREREQ: PSYC207 and PSYC209
RESTRICTIONS: If both PSYC334 and PSYC380 are taken, only PSYC334 will count for major credit. Open to psychology majors and minors only

PSYC 390  SOCIAL PSYCHOLOGY
An analysis of theory and research in social psychology including the topics of social cognition, attitudes, interpersonal, group and intergroup relations. Student-designed research projects including data collection and analysis
PREREQ: PSYC207 and PSYC209
RESTRICTIONS: If both PSYC303 and PSYC390 are taken, only PSYC303 will count for major credit. Open to psychology majors and minors only
PSYC 394  CULTURAL PSYCHOLOGY
Introduction to the study of how culture shapes psychological experience, including social behavior, cognition, motivation, and the experience of the self. Covers psychological theory and research on human cultural variation and focuses on different national populations (especially North Americans and East Asians), with some attention to the psychological experience of multicultural populations within the United States. PREREQ: PSYC207 and PSYC209

PSYC 403  PSYCHOLOGY OF NONVERBAL BEHAVIOR
A seminar on the social psychological implications of the research literature on nonverbal behavior in social interaction. Focuses on interpersonal attraction, leadership, impression formation, casual attribution, deception, social attitudes and cross-cultural factors, with practical applications. PREREQ: PSYC207 and PSYC209

PSYC 406  REDUCTION OF INTERGROUP CONFLICT
The reduction of intergroup conflict in business, educational and experimental laboratory settings, with special attention given to organizational mergers. Investigation of strategies for reducing intergroup conflict. PREREQ: PSYC207 and PSYC209

PSYC 407  EMOTIONS AND PREVENTIVE INTERVENTION
The emotions: their neural, expressive, and experiential components and their relation to adaptive and maladaptive behavior. Translating emotion theory and research into therapeutic and preventive interventions. Requirements include doing emotion tutoring with child abuse/addiction. PREREQ: PSYC207 and PSYC209

PSYC 410  BIOLOGICAL BASIS OF MOTIVATION AND EMOTION
An evolutionary approach towards three major modern theories of motivation: ethologists' instinct theory, Freud's psychoanalytic theory and psychologists' drive theory. Covers current work on circulation rhythms, obesity and anorexia, sleep, fever, phobias, learned helplessness, voodoo death, fear, love and aggression. PREREQ: PSYC207 and PSYC209

PSYC 411  IDEAS IN BIOPSYCHOLOGY
Focuses on important ideas in biopsychology as communicated in seminal books. Examines at least six influential books in psychology, biology, or philosophy. Students lead the discussions, which will be "problem-based" and focused on the personal and social context, theoretical importance, and social impact of the book. Reading list includes books by Darwin, Dawkins, Sacks, Golem, Gould, and Lorenz. PREREQ: PSYC207 and PSYC209

PSYC 412  HORMONES AND BEHAVIOR
Focuses on description of the physiology of human hormones and the relations of hormones to behavior. PREREQ: PSYC207 and PSYC209

PSYC 414  DRUGS AND THE BRAIN
Topics covered include drug treatment of mental illness, and drug abuse/addiction. PREREQ: PSYC207 and PSYC209

PSYC 415  HISTORY AND SYSTEMS OF PSYCHOLOGY
Psychology from the early Greeks through the more important "schools" of the 20th century. PREREQ: PSYC207 and PSYC209

PSYC 416  PSYCHOLOGICAL PERSPECTIVES ON THE BLACK AMERICAN
The experience of Black Americans as viewed from a psychological perspective. Psychological theory and research pertaining to Black Americans; reactions to oppression, collective behavior, personality development, and life styles. May be crosslisted with BAMS432. PREREQ: PSYC207 and PSYC209

PSYC 420  MENTAL ILLNESS: HISTORICAL AND CRITICAL PERSPECTIVES
Explores historical and current issues in understanding mental illness from biomedical and social constructionist perspectives. Focuses on recent advances and problems in conceptions of cause, diagnosis, and intervention. PREREQ: PSYC207 and PSYC209

PSYC 421  BIOLOGY AND BEHAVIOR: GENDER, INTELLIGENCE AND PSYCHOPATHOLOGY
Critically examines psychological claims about the relations between biology and behavior. Organized around the topics of gender, intelligence, and psychopathology and addresses issues raised by evolutionary psychology, behavioral genetics, and biological and brain reductionism. PREREQ: PSYC207 and PSYC209

PSYC 424  APPLIED SOCIAL PSYCHOLOGY
The application of basic principles of interpersonal behavior to everyday life. Topics covered include persuasion, acculturation, employee motivation, organizational development, liking and authority. PREREQ: PSYC207 and PSYC209

PSYC 425  FAMILY CONFLICT AND THE CHILD
Analysis of specific topic areas in child psychology, such as infancy and cognitive and social development. Topics may vary from year to year. PREREQ: PSYC207 and PSYC209

PSYC 433  COGNITIVE NEUROSCIENCE
Examines the brain mechanisms responsible for cognitive functions such as perception, memory, and language. Examines the methods and current research into the neural mechanisms underlying cognition, the principles and the applications for relating mind and brain. PREREQ: PSYC207 and PSYC209

PSYC 440  TOPICS IN PSYCHOLINGUISTICS
Advanced study in the psychology of language. Topics may include linguistic and conceptual development, language and space, the acquisition of the lexicon, and includes in-class demonstrations of perceptual illusions, memory distortions, and imagery. PREREQ: PSYC207 and PSYC209

PSYC 442  PERCEPTION, MEMORY AND IMAGINATION
Addresses controversial issues about what it means to perceive, remember, and imagine our world. Examines research from cognitive psychology, cognitive science, and neuropsychology and includes in-class demonstrations of perceptual illusions, memory distortions, and imagery. PREREQ: PSYC207 and PSYC209

PSYC 443  TOPICS IN ORGANIZATIONAL COMMUNICATION
Advanced study in the psychology of language. Topics may include linguistic and conceptual development, language and space, the acquisition of the lexicon, and includes in-class demonstrations of perceptual illusions, memory distortions, and imagery. PREREQ: PSYC207 and PSYC209

PSYC 445  TOPICS IN ADOLESCENT PSYCHOLOGY
Analysis of the physiological, psychological and social factors influencing psychological development from late childhood through adolescence. PREREQ: PSYC207 and PSYC209

PSYC 460  ASSESSMENT OF YOUNG CHILDREN
See IFS452 for course description

PSYC 462  LANGUAGE ACQUISITION
See EDUC462 for course description

PSYC 466  INDEPENDENT STUDY
PREREQ: PSYC207 and PSYC209

PSYC 468  RESEARCH
PREREQ: PSYC207 and PSYC209

PSYC 481  CLINICAL PSYCHOLOGY
Introduction to clinical theories, research and practices. Diagnosis, classification and treatment of behavior disorders. PREREQ: PSYC207 and PSYC209

PSYC 484  SOCIA Motivation
Analysis of theory and research in the social psychology of motivation. Students may choose to study either leisure behavior or work motivation. PREREQ: PSYC207 and PSYC209

PSYC 490  SOCIAL INTERDEPENDENCE
Introduces theoretical and empirical approaches to the study of conflict versus cooperation between mutually dependent people. Cooperation/conflict is analyzed in terms of the effects of environmental influence, the reward structure of the relationship, and the interpersonal values of participants. PREREQ: PSYC207 and PSYC209

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PSYC 491: Psychology of Temporal Orientation 3
The scientific study of how temporal frames of reference regarding the past, present and future affect a variety of basic human processes, especially human behavior.
PREREQ: PSYC207 and PSYC209
RESTRICTIONS: Open to junior and senior psychology majors and minors only.

PSYC 612: Human Psychophysiology 3
Introduction to psychophysiological recording techniques. Elementary anatomy and physiology of the human nervous system. Application of psychophysiological techniques to the investigation of psychopathology, information processing and social psychology. Laboratory demonstration of polygraphic measurement of autonomic and CNS variables with small computer analysis.

PSYC 614: Psychopharmacology 3
Addresses the actions and neurobiology of psychoactive drugs. Emphasis on therapeutic drugs used for major classes of mental and neurological disorders. Drugs of abuse and mechanisms of drug addiction also are discussed.

PSYC 626: Neuroscience I 4
Structure and function of the sense organs, nervous system and motor systems in relation to integrated behavior. May be cross-listed with BISC626.
PREREQ: BISC306, PSYC314, and PSYC310 or PSYC312.

PSYC 627: Neuroscience II 3
See BISC627 for course description.

PSYC 630: Neurons and Networks 3
Introduction to computational neuroscience: computing by real and artificial neurons and networks, and modeling of brain function. Covers theoretical background and involves hands-on projects to explore processing of sensory information, pattern discrimination, learning, memory and behavior. May be cross-listed with CGSC630 and/or CPEG630.
RESTRICTIONS: Requires permission of instructor.

PSYC 642: Mental Representation and Memory 3
Human memory can be conceptualized in terms of representation and information storage within various interrelated mental systems. Critically evaluates research on human memory and representation within the context of major cognitive models. May be cross-listed with CGSC642.
RESTRICTIONS: Requires permission of instructor.

PSYC 668: Research 1-6
See EDUC675 for course description.

PSYC 675: Language Acquisition 4
See EDUC675 for course description.

PSYC 692: Social Skills Training for Children 3
See EDUC692 for course description.

PSYC 807: Group and Interpersonal Processes 3
Addresses basic theoretical and empirical knowledge of group processes, structures and interactions.
RESTRICTIONS: Requires permission of instructor.

PSYC 809: Research Design 3
An overview of methodological issues in the conduct of psychological research, including correlational, experimental, and quasi-experimental studies. Special emphasis on clinical and personality research.
RESTRICTIONS: Requires permission of instructor.

PSYC 813: Seminar in Intergroup Relations 3
Cognitive, motivational and cultural factors involved in the creation of and reduction of intergroup bias and conflict. Emphasis on theoretical and applied perspectives.
RESTRICTIONS: Requires permission of instructor.

PSYC 817: Individual Intelligence Testing 3
See EDUC817 for course description.

PSYC 819: Psychotherapy I 3
Survey of theories, schools and techniques of psychotherapy and critical review of relevant research.
RESTRICTIONS: Requires permission of instructor.

PSYC 820: Psychodiagnosis: Objective Trait and Behavioral Assessment 3
RESTRICTIONS: Requires permission of instructor.

PSYC 823: Learning and Development 3
See EDUC823 for course description.

PSYC 827: Advanced Psychotherapy II 3
Schools, theories and techniques of psychotherapy including research on psychotherapy and review of evaluative studies. Supervised practice.
PREREQ: PSYC819
RESTRICTIONS: Requires permission of instructor.

PSYC 829: Advanced Psychopathology 3
Nosology and etiology of the behavior disorders of non-organic origin. Theories of psychopathology, including various modes of conceptualizing psychopathology, i.e., medical vs. behavioral and psychosocial models. Reliability and validity of psychodiagnosis; and relevant research and problems of experimental clinical research with institutionalized populations.
RESTRICTIONS: Requires permission of instructor.

PSYC 834: Supervised Practice in Clinical Psychology I 1-3 PF
Limited diagnostic and therapeutic practice in clinical setting under professional supervision.
RESTRICTIONS: Requires permission of instructor.

PSYC 835: Supervised Practice in Clinical Psychology II 1-3 PF
Continuation of PSYC834.
RESTRICTIONS: Requires permission of instructor.

PSYC 836: Supervised Practice in Clinical Psychology III 1-3 PF
Continuation of PSYC834 and PSYC835.
PREREQ: PSYC834 and PSYC835
RESTRICTIONS: Requires permission of instructor.

PSYC 837: Supervised Practice in Clinical Psychology IV 1-3 PF
Continuation of PSYC834, PSYC835 and PSYC836.
PREREQ: PSYC836
RESTRICTIONS: Requires permission of instructor.

PSYC 845: Childhood Psychopathology 3
See EDUC845 for course description.

PSYC 860: Psychological Statistics 3
Applications to behavior measurement of probability, regression and analysis of variance and covariance; psychometrics and scaling techniques; and design of experiments.
RESTRICTIONS: Requires permission of instructor.

PSYC 861: Psychological Statistics 3
Further applications to behavior measurement of probability, regression and analysis of variance and covariance; psychometrics and scaling techniques; and design of experiments.
RESTRICTIONS: Requires permission of instructor.

PSYC 866: Research 1-6
See EDUC866 for course description.

PSYC 869: Master's Thesis 1-6
RESTRICTIONS: Requires department permission.

PSYC 964: Pre-Candidacy Study 3-12 PF
Research and readings in preparation of dissertation and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

PSYC 969: Doctoral Dissertation 1-12 PF

RUSS 105: Russian I - Elementary 4
Introduction to the Russian language and development of speaking, listening, reading and writing skills through the use of basic texts.

RUSS 106: Russian II - Elementary/Intermediate 4
Completion of basic Russian. Increasing mastery of the basic skills of speaking, listening, reading and writing.
PREREQ: RUSS105
RESTRICTIONS: Two to three years of high school Russian acceptable in lieu of prerequisite.

RUSS 107: Russian III - Intermediate 4
Review of grammar, continued practice in speaking and writing, and reading texts of average difficulty.
PREREQ: RUSS106
RESTRICTIONS: Four years of high school Russian acceptable in lieu of prerequisite.
Satisfies College of Arts and Sciences language requirement.
RUSS 200  RUSSIAN GRAMMAR REVIEW 3
Systematic review of elementary and intermediate Russian grammar, study of
complex sentence structure and idioms. Some conversational practice.
PREREQ: RUSS107

RUSS 205  RUSSIAN CONVERSATION 3
Practical use of the language. Emphasis on topics drawn from contemporary
Russian life and literature.
PREREQ: RUSS107

RUSS 211  RUSSIAN READING AND COMPOSITION: SHORT FICTION 3
Reading and discussion of 20th-century Russian short stories and novels.
Several short compositions. Grammar review where appropriate.
PREREQ: RUSS107

RUSS 305  RUSSIAN CONVERSATION AND COMPOSITION 3
Discussion of current cultural, social and political topics in Russia and the former
republics. Vocabulary building, grammar exercises and frequent compositions.
PREREQ: Any 200-level course conducted in Russian

RUSS 310  INTRODUCTION TO RUSSIAN LITERATURE I 3
Masterpieces of poetry, narrative prose and drama from the 19th century.
PREREQ: RUSS211 or RUSS305.

RUSS 312  INTRODUCTION TO RUSSIAN LITERATURE II 3
Masterpieces of poetry, narrative prose and drama from the 20th century.
PREREQ: RUSS211 or RUSS305.

RUSS 325  RUSSIAN CIVILIZATION AND CULTURE 3
Survey of the major cultural, social and political developments in Russia from its
inception to the present.
PREREQ: RUSS211 or RUSS305.

RUSS 366  INDEPENDENT STUDY 1-3

RUSS 401  ADVANCED RUSSIAN GRAMMAR AND COMPOSITION 3
Selected topics in advanced Russian grammar, with special attention to participial
constructions, verbs of motion, aspect and problems of syntax and word order.
Exercises in writing correct and idiomatic Russian.
PREREQ: One 300-level Russian course.

RUSS 440  SPECIAL TOPICS: RUSSIAN DRAMA, PROSE OR POETRY 3
Explores one of the three major genres by examining a specific theme. Subject
matter varies and will be announced in registration booklet.
PREREQ: Any two 300-level Russian courses.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 455  SELECTED AUTHORS, WORKS AND THEMES 3
Works of one or more outstanding authors or on a special theme.
PREREQ: Two 300-level Russian literature courses.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 465  SEMINAR 3
Various authors and themes.
PREREQ: One 400-level Russian literature course.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 466  INDEPENDENT STUDY 1-3

RUSS 665  SEMINAR 3
Various authors and themes.
RESTRICTIONS: May be repeated for credit when topics vary.

SCEN 101  PHYSICAL SCIENCE 3-4
The structure, processes and concepts of the physical world.
RESTRICTIONS: Requires high school algebra. For non-science students with no
physics or chemistry background. Not for physics or chemistry major credit.
Only one course from among SCEN101, PHYS104, PHYS201 or PHYS207 can count
toward graduation.

SCEN 102  PHYSICAL SCIENCE 3-4
The structure, processes and concepts of the physical world.
RESTRICTIONS: Requires high school algebra. For non-science students with no
physics or chemistry background. Not for physics or chemistry major credit.
Only one course from among SCEN102, PHYS202 or PHYS208 can count
toward graduation.

SCEN 103  CONCEPTS OF SCIENCE AND TECHNOLOGY 3
Introduction to some of the fundamental science concepts underpinning high
technology, emphasizing everyday devices and practical experience, for the
development of scientific and computer literacy of non-science majors.
RESTRICTIONS: Requires high school algebra.

SCEN 340  ADVANCED SCIENCE FOR TEACHERS 4
Provides advanced background study for students in the Elementary Teacher
Education Millford Program. Topics are drawn from physical, earth and biological
sciences and build on science courses previously taken in the program. The areas
of science outlined in the State Science Performance Indicators are covered.
Along with lecture/discussion, students have hands-on laboratories (including the
Smithsonian kits used by the District).
RESTRICTIONS: Offered to students in the Milford ETE program.

SCEN 344  SCIENCE AND RELIGION 3
See PHIL344 for course description.

SCEN 491  TEACHING SCIENCE IN SECONDARY SCHOOLS 4
Techniques, approaches and preparation for teaching science in high school and
middle school. Laboratory meets one full morning per week in local high schools
and middle schools for observation and initial teaching.
COREQ: EDUC420 for chemistry education and biology education majors.

SCEN 492  STUDENT TEACHING SEMINAR: SECONDARY SCIENCE 3 PF
Methods, techniques and problems in student teaching in secondary schools and
their solutions. Assertiveness, authority, management, strategies and teaching for
understanding.
COREQ: EDUC400.

SOCI 201  INTRODUCTION TO SOCIOLOGY 3
An overview of the sociological perspective of the study of society, social
organization and social institutions with special emphasis on the social causes
and consequences of human behavior.

SOCI 203  INDIVIDUAL AND SOCIETY 3
Analysis of the social formation of the individual. Particular emphasis on
socialization and personality development. The contribution of individual patterns
of behavior to the functioning of social systems.

SOCI 204  URBAN COMMUNITIES 3
Urbanization, rural-urban social differences and the organization of urban
communities by race, class, ethnicity and stage in the life cycle.
May be cross-listed with BAMS204.

SOCI 206  WOMEN AND WORK 3
See WOMS206 for course description.

SOCI 209  SOCIAL PROBLEMS 3
Topics may include poverty, intergroup conflicts, war, mental illness, aging,
adolescence and environmental pollution.

SOCI 211  MEN, CONFLICT AND SOCIAL CHANGE 3
See WOMS211 for course description.

SOCI 213  MEN AND WOMEN IN AMERICAN SOCIETY 3
Designed to provide students with a sociological framework for analyzing sex
and gender relations in contemporary American society. Topics include the social
construction of gender, patterns of sex-role socialization, gender stratification in
the paid work force, gender relations in the family and other social institutions.
May be cross-listed with WOMS213.

SOCI 215  RACE IN SOCIETY 3
Social definitions of race, how race is incorporated into social institutions and
how race structures relationships among diverse groups in society. Includes
analysis of rights and privileges denied or extended to groups and how
disadvantaged groups work towards racial equality.
May be cross-listed with BAMS215.

SOCI 266  SPECIAL PROBLEM 1-3

SOCI 270  FAMILIES AND DEVELOPMENTAL DISABILITIES 3
See IFST270 for course description.

SOCI 301  INTRODUCTION TO SOCIOLOGICAL RESEARCH 4
Survey of research methods and data analysis employed in sociology.
PREREQ: SOC1201 and completion of the College of Arts and Sciences math
requirement.
RESTRICTIONS: Strongly recommended - junior status and 12 social science
credits.
SOCI 302 SOCIAL DEViance 3
Defining deviance, research on deviance and explaining deviance
May be cross-listed with CRJU302

SOCI 303 JUvenile DELINQUENCY 3
Historical definition of delinquency, abuse and neglect, research in delinquency, causes and treatment of delinquents
May be cross-listed with CRJU303.
PREREQ: SOCI201 or SOCI209

SOCI 304 CRIMINOLOGY 3
The nature, kinds and causes of crime. Criminal liability, criminal careers and organized racketeering
May be cross-listed with CRJU304.
PREREQ: SOCI201 or SOCI209

SOCI 305 SOCIAL CLASS AND INEQUALITY 3
Internal differentiation as a basis for inequality and differential life chances of human societies

SOCI 306 PERSONALITY AND SOCIETY 3
Interaction of personality and society, including such segments as complex organizations and small groups. Particular emphasis on the social formation of personality, and its role in the production of various modes of social behavior and the dynamics of social change
PREREQ: SOCI201, SOCI203 or PSYC100

SOCI 308 THE FAMILY 3
The comparative study of the family in various societies provides a background for the analysis of family organization in modern America
PREREQ: SOCI201 or SOCI203 or SOCI209.

SOCI 311 SOCIOLOGY OF HEALTHCARE 3
Professionalization of health occupations, hospitals as social systems, medical education and practice organizations, healthcare organizations and their interrelationships (polities of health), and health service patterns
May be cross-listed with CSCI311

SOCI 312 THEORIES OF SOCIETY 3
Covers writings of Karl Marx, Emile Durkheim, Max Weber and related current approaches. Focuses on theoretical perspectives concerned with social development, social conflict, solidarity, social class and gender
PREREQ: SOCI201.

SOCI 320 PERSONALITY AND POLITICS 3
The role of personality in political behavior. Considerations include the social and psychological motivations for political activity and the differential relationship of personality to variations in political systems, roles, ideologival dynamics, such as political consensus and cleavage. Attention given to particular methods of research in this specific area of social behavior
PREREQ: SOCI201 or SOCI203 or PSYC100 or PSYC150

SOCI 322 CROWDS, CULTS AND REVOLUTIONS 3
Analysis of forms of behavior in relatively unstructured situations such as crowds, panics, riots and demonstrations; and processes of interaction: susceptibility, contagion, polarization and communication
May be cross-listed with CRJU222
PREREQ: SOCI201

SOCI 323 SOCIOLOGY OF RISK 3
Focuses on how individuals, organizations, and government agencies assess various types of risk and act with respect to those assessments. Topics include: risk perception, risk assessment, risk management under conditions of scientific uncertainty, and public debates about safety
PREREQ: SOCI201

SOCI 324 ISSUES IN EMERGENCY MANAGEMENT 3
Overview of the development of emergency management in the United States as a profession. Issues associated with emergency management are also discussed with reference to the disaster research literature
PREREQ: SOCI201

SOCI 325 DISASTERS AND SOCIETY 3
Sociological introduction to the field of disaster studies, including the ways in which societies attempt to prepare for, respond to, and recover from their impacts
PREREQ: SOCI201.

SOCI 326 EMERGENCY AND ENVIRONMENTAL MANAGEMENT PRACTICUM AND SEMINAR 4 PF
Internship in an organization or agency responsible for emergency or environmental management. With approval of the area coordinator, student is assigned to an organization to become familiar with issues, policies and practices pertaining to disasters. Student under direct supervision of agency personnel while in the placement position. In addition to the internship, students are expected to meet weekly in a seminar with the area coordinator and other students to discuss issues and experiences
PREREQ: SOCI201 or SOCI203, and SOC11T0.
RESTRICTIONS: Approval of the area coordinator

SOCI 327 SOCIOLOGY OF ORGANIZATIONS 3
Business enterprises, the military, governmental bureaus and other large-scale organizations. Bureaucratic structure, internal systems of status and authority, division of labor, social control, and the individual in the organization
PREREQ: SOCI201.

SOCI 328 WORK IN A GLOBAL ECONOMY 3
The role of work in contemporary society. Social, institutional and cultural influences on work. Special emphasis on problem areas such as job satisfaction, professionalism, career patterns, leisure and occupational choice

SOCI 329 INTERNATIONAL MIGRATION 3
See POSC329 for course description

SOCI 330 POPULATION, LAW AND SOCIETY 3
Interrelationships among population, law and social structure with an emphasis on analyzing strategies of adaptation to change. Introduction to demographic techniques; contemporary issues such as family planning, population policies, migration, marriage and divorce

SOCI 331 WORLD POPULATIONS: PROFILES AND TRENDS 3
Study of the size, composition and distribution of world populations. An examination of the structure and dynamics of selected countries and the specific problems-causes, consequences and possible solutions. Population problems are examined in relationship to social organization, environment and technology

SOCI 336 THE Detective IN FILM AND FICTION 3
See CRJU336 for course description

SOCI 341 WELFARE AND SOCIETY 3
Institutional apparatus created to deal with the welfare problems of an industrial society, development of welfare institutions, their structure and functioning
PREREQ: 18 credit hours in sociology, psychology, political science or economics.

SOCI 343 SOCIETY, POLITICS AND HEALTHCARE 3
See POSC343 for course description

SOCI 345 SOCIOLOGY OF LAW 3
Analysis of law as a social process in both historical and comparative perspective. Focuses on various theories of law and society and relevant empirical research
May be cross-listed with CRJU345

SOCI 346 GENDER AND AGING 3
Empirical and theoretical investigation of the aging process
PREREQ: SOCI201 or SOCI203 or PSYC100

SOCI 348 THEORIES OF SOCIAL WORK PRACTICE 3
Methods of social work practice; casework, group work, community organization; sociological and psychological foundations underlying social services
PREREQ: SOCI201

SOCI 350 SOCIAL INEQUALITY AND FILM 3
Using a sociological framework for understanding equality, major films are used to explore the depictions and representations of race, gender, sexuality and social class issues. Examines the ideologies presented in films, the contexts that create them and how they contrast with social realities
PREREQ: SOCI201

SOCI 356 RACE, CLASS AND CRIME 3
See CRJU355 for course description

SOCI 360 SOCIOLOGY OF RELIGION 3
Sociological analysis of major religions and the societies with which they have been associated; social settings of particular systems of belief; the relation of status; religious affiliation and personal behavior in modern societies
May be cross-listed with JWST360

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SOCL 361 RACIAL INEQUALITY 3
A detailed examination of racial inequality, including the social construction of race, the nature of oppression and advantage, government policies and resistance strategies. There will be attention to the status of men and women and social class diversity within racial-ethnic communities. May be cross-listed with BAMS361.
PREREQ: SOCI201.

SOCL 366 INDEPENDENT STUDY 1-3

SOCL 368 INDEPENDENT RESEARCH 1-6
Independent research under the supervision of a faculty member. Requirements include preparation of a research report consistent with the professional literature in the field. Student and faculty member will file a learning contract describing the research and a report with the department chair.
RESTRICTIONS: Requires permission of instructor.

SOCL 369 ALCOHOL, DRUGS AND CRIME 3
See CRJU369 for course description
PREREQ: CRJU110 or SOCI201.

SOCL 399 PRACTICUM: TEACHING SOCIOLOGY 3 PF
Practical experience in undergraduate education is gained by serving as a discussion leader in a course taught by a regular member of the faculty
RESTRICTIONS: Requires permission of instructor. Not for major credit.

SOCL 401 ADVANCED SOCIOLOGICAL METHODS 3
Conceptualization, design, data collection and data analysis in sociological research

SOCL 402 URBAN STUDIES PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in urban planning and service agencies where students work for approximately 160 hours under professionally trained supervisors. Students meet in a weekly seminar with coordinator.
PREREQ: SOCI204.

SOCL 407 SOCIOLOGY OF SEX AND GENDER 3
Seminar on sex and gender relations from a sociological perspective. Surveys current research on gender stratification in the paid work force, the feminization of poverty, gender relations in the family, sexual violence, and feminism as a social movement. Special attention given to current theoretical debates on the origins and persistence of sexual inequality and the intersection of gender with race and class in patterns of social stratification.
May be cross-listed with WOMS407.
PREREQ: SOCI201, and either SOCI213 or WOMS201.
RESTRICTIONS: Restricted to junior and senior sociology and women's studies majors.

SOCL 410 HEALTH SERVICES PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in health service settings where student works for about 160 hours under supervision of health service administrators. Students meet in a weekly seminar with coordinator.
RESTRICTIONS: Requires permission of instructor.

SOCL 411 TECHNIQUES OF DEMOGRAPHIC ANALYSIS 3
Study of demographic equation (fertility, mortality and migration), population processes (composition and distribution) and the use of computers to analyze demographic data.
PREREQ: SOCI301.

SOCL 412 RESEARCH PRACTICUM 4 PF
Field experience and related seminar. Placement in research, planning and service agencies where students work for approximately 160 hours under professionally trained supervisors. Students meet in a weekly seminar with coordinator.
PREREQ: SOCI301
RESTRICTIONS: Requires permission of instructor.

SOCL 415 RACE, CLASS AND GENDER 3
Analysis of current American social issues that show interrelationship of race, class and gender. Readings from sociology, Afro-American studies, feminist studies, history and literature.
May be cross-listed with BAMS415 and/or WOMS415.

SOCL 416 SOCIAL THOUGHT AND CONTEMPORARY SOCIETY 3
Seminar focuses on ways in which social thought defines and analyzes contemporary society. Explores how alternative theories and methods serve to create knowledge about contemporary concerns with everyday life, democracy, equality, social structure and power.
PREREQ: SOCI312.

SOCL 418 RACE, GENDER AND POVERTY 3
An examination of contemporary American poverty with attention to race and gender as fundamental dimensions of inequality. Social policy, employment and family composition are key topics.
May be cross-listed with BAMS418 and/or WOMS418.
PREREQ: SOCI201.

SOCL 422 FADS AND FASHIONS 3
Examination of the dynamics of short-term enthusiasm. Emphasis will be on fads and fashions in education, science, medicine, and other institutions, rather than on fashions in clothing.

SOCL 428 CORPORATE CRIME 3
Nature and causes of the deviant behaviors and crimes of large organizations. How organizations act, are accused of deviance and defend themselves in cases such as price-fixing, sale of unsafe drugs and illegal spying.
May be cross-listed with CRJU428.

SOCL 430 COMPARATIVE SOCIOLOGY 3
Examines sociological similarities and differences between the United States and a selected country on a number of critical sociological topics. Topics include ethnic and religious diversity, culture, demographic structure, social institutions, social stratification and urbanization.
May be cross-listed with JWST430.
RESTRICTIONS: Requires permission of instructor. Only three credits may apply toward departmental requirement of six 400-level credits. Offered only in the study abroad program and subject to acceptance by the Office of International Programs.

SOCL 433 SOCIOLOGY OF AMERICAN JEWRY 3
Examines the demographic, socioeconomic, cultural and institutional dimensions of the US Jewish population in the context of models of social integration and in comparison to other immigrant groups in the population. These dimensions are used to discuss current issues facing this population sub-group.
May be cross-listed with JWST433.
PREREQ: SOCI201.

SOCL 441 SOCIAL WELFARE PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in social service agencies where students work for approximately 160 hours under professionally trained supervisors; students meet in a weekly seminar with coordinator.
PREREQ: SOCI341.
RESTRICTIONS: Requires permission of instructor.

SOCL 442 LAW AND SOCIETY PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in court, law firm or other law-related institutions where students work for approximately 160 hours under professionally trained supervisors; weekly seminar with program coordinator.
PREREQ: SOCI345.
RESTRICTIONS: Requires permission of instructor.

SOCL 448 COMMUNITY-BASED TREATMENT 3
Explores issues related to the appropriateness and design of community-based programs for the mentally disabled, substance abusers, the homeless, dependent children, etc. Emphasis on analyzing client needs and community resources, and on understanding the perspectives of clients, staff and neighbors about these programs.
May be cross-listed with CRJU448.

SOCL 450 POLITICAL SOCIOLOGY 3
Analysis of political organization and action, including evaluation of major approaches. Case studies of political structures and behavior.
PREREQ: SOCI201.

SOCL 456 LAWYERS AND SOCIETY 3
Seminar focusing upon the social organization and dynamics of the legal profession. Topics include professional association, law school socialization, professional ethics and law practice.
May be cross-listed with CRJU456.
PREREQ: SOCI201 and three additional sociology courses.

SOCL 460 WOMEN IN INTERNATIONAL DEVELOPMENT 3
Understanding of international development process in third world countries by examination of the roles of men and women. Analyzes processes of development with emphasis on women's participation and/or exclusion. Examines development at the project proposal or program implementation level. Hands-on experience in practical project development and proposal presentation skills.
May be cross-listed with GEGC460, IFST460, and/or WOMS460.

SOCL 464 INTERNSHIP 1-4 PF
Provides students an opportunity to apply sociological theory and research while working in an agency or other organizational setting under supervision of department faculty. Must complete an internship agreement and secure approval from faculty member to sponsor internship.
A substantive and theoretical introduction to the major issues in environmental sociology: the emergence and development of the environmental movement; the development of environmental issues; and how environmental issues are related to structural, contextual and perceptual factors.

RESTRICTIONS: Requires upper division status.

SOCIOLOGY 620
Field Experience in Criminal Justice
See CR/J/495 for course description

SOCIOLOGY 621
Practicum in Teaching
1–3 PF

SOCIOLOGY 622
Qualitative Methodology
3

SOCIOLOGY 623
Sociology of Gender
3

SOCIOLOGY 624
Gender, Work, and Families
3

SOCIOLOGY 625
Techniques of Demographic Analysis
3

SOCIOLOGY 626
Development of Sociological Theory
3

SOCIOLOGY 627
Advanced Data Analysis
3

SOCIOLOGY 628
Theories and Approaches in Social Deviance
3

SOCIOLOGY 629
Collective Behavior
3

SOCIOLOGY 630
Corporate and Governmental Deviance
3

SOCIOLOGY 631
Law and Society in Historical Perspective
3

SOCIOLOGY 632
Law and Society
3

SOCIOLOGY 633
Social Science, Law and the Legal Process
3

SOCIOLOGY 634
Practicum in Teaching
1–3 PF

SOCIOLOGY 635
Qualitative Methodology
3

SOCIOLOGY 636
Sociology of Gender
3

SOCIOLOGY 637
Gender, Work, and Families
3

SOCIOLOGY 638
Techniques of Demographic Analysis
3

SOCIOLOGY 639
Development of Sociological Theory
3

SOCIOLOGY 640
Advanced Data Analysis
3

SOCIOLOGY 641
Theories and Approaches in Social Deviance
3

SOCIOLOGY 642
Collective Behavior
3

SOCIOLOGY 643
Corporate and Governmental Deviance
3

SOCIOLOGY 644
Law and Society in Historical Perspective
3

SOCIOLOGY 645
Law and Society
3

SPANISH

SPANISH 101
Elementary Spanish I
3

SPANISH 102
Elementary Spanish II
3

SPANISH 105
Spanish I – Elementary
4

SPANISH 106
Spanish II – Elementary/Intermediate
4

SPANISH 107
Spanish III – Intermediate
4

SPANISH 111
Advanced Data Analysis
3

SPANISH 112
Theories and Approaches in Social Deviance
3

SPANISH 113
Collective Behavior
3

SPANISH 114
Corporate and Governmental Deviance
3

SPANISH 115
Law and Society in Historical Perspective
3

SPANISH 116
Law and Society
3

SPANISH 117
Social Science, Law and the Legal Process
3

SPANISH 118
Practicum in Teaching
1–3 PF

SPANISH 119
Qualitative Methodology
3

SPANISH 120
Sociology of Gender
3

SPANISH 121
Gender, Work, and Families
3

SPANISH 122
Techniques of Demographic Analysis
3

SPANISH 123
Development of Sociological Theory
3

SPANISH 124
Advanced Data Analysis
3

SPANISH 125
Theories and Approaches in Social Deviance
3

SPANISH 126
Collective Behavior
3

SPANISH 127
Corporate and Governmental Deviance
3

SPANISH 128
Law and Society in Historical Perspective
3

SPANISH 129
Law and Society
3
### SPANISH

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 111</td>
<td>Intermediate Spanish I</td>
<td>3</td>
<td>Review of grammar. Increasing mastery of the basic skills of speaking, listening, reading and writing. PREREQ: SPAN102 or SPAN106. RESTRICTIONS: Three years of high school Spanish acceptable in lieu of prerequisite.</td>
</tr>
<tr>
<td>SPAN 112</td>
<td>Intermediate Spanish II</td>
<td>3</td>
<td>Continued practice in speaking and writing, reading texts of average difficulty, grammar review needed. PREREQ: SPAN111. RESTRICTIONS: Four years of high school Spanish acceptable in lieu of prerequisite. Satisfies College of Arts and Sciences language requirement.</td>
</tr>
<tr>
<td>SPAN 200</td>
<td>Spanish Composition and Grammar</td>
<td>3</td>
<td>First part of a thorough grammar review and intensive practice, targeting structure, essential vocabulary, speaking, listening and extensive writing. PREREQ: SPAN107 or SPAN112.</td>
</tr>
<tr>
<td>SPAN 201</td>
<td>Spanish Reading and Composition</td>
<td>3</td>
<td>Major emphasis on reading development, composition and literary analysis. PREREQ: SPAN200.</td>
</tr>
<tr>
<td>SPAN 205</td>
<td>Spanish Conversation</td>
<td>3</td>
<td>Practical use of Spanish by means of oral reports and discussions. Emphasis on improvement of basic conversational skills. Grammar review where appropriate, and/or some written work. PREREQ: SPAN107 or SPAN112. RESTRICTIONS: Prerequisites require a minimum grade of B. Not intended for native speakers.</td>
</tr>
<tr>
<td>SPAN 206</td>
<td>Culture Through Conversation</td>
<td>3</td>
<td>Discussion of topics drawn from contemporary Spanish or Latin American life. For students who wish to broaden their knowledge of Hispanic culture while improving their oral and aural language skills. PREREQ: SPAN107 or SPAN112. RESTRICTIONS: Taught abroad only.</td>
</tr>
<tr>
<td>SPAN 207</td>
<td>Contemporary Latin America I</td>
<td>3</td>
<td>Introduction to contemporary Latin America, its culture, its people, their way of life and the issues confronting them. RESTRICTIONS: Taught abroad, in both English and Spanish. Not for major credit. Does not satisfy College of Arts and Sciences language requirement. May be repeated for credit when taken on different study abroad programs.</td>
</tr>
<tr>
<td>SPAN 208</td>
<td>Contemporary Spain I</td>
<td>3</td>
<td>Introduction to contemporary Spain, its culture, its people, their way of life and the issues confronting them. RESTRICTIONS: Taught abroad, in both English and Spanish. Not for major credit. Does not satisfy College of Arts and Sciences language requirement.</td>
</tr>
<tr>
<td>SPAN 234</td>
<td>Latin America in the News</td>
<td>3</td>
<td>Explores topics in contemporary Latin American society, culture and politics as expressed in the news media. Emphasis on current events and issues of Latin America. Focus of study is the Latin American press: newspapers and magazines printed in the Latin American language. PREREQ: SPAN107 or SPAN112. SPAN200 highly recommended.</td>
</tr>
<tr>
<td>SPAN 235</td>
<td>Spain in the News</td>
<td>3</td>
<td>Explores topics in contemporary Spanish society, culture and politics as expressed in the news media. Emphasis on current events and issues of Spain. Focus of study is the Spanish press: newspapers and magazines printed in the Spanish language. PREREQ: SPAN107 or SPAN112. SPAN200 highly recommended.</td>
</tr>
<tr>
<td>SPAN 300</td>
<td>Advanced Spanish Composition and Grammar I</td>
<td>3</td>
<td>Second part of a thorough review and intensive practice, targeting structure, essential vocabulary, speaking, listening and extensive writing. PREREQ: SPAN200.</td>
</tr>
<tr>
<td>SPAN 301</td>
<td>Survey of Spanish Literature</td>
<td>3</td>
<td>Development of Spanish literature from its origins through the 17th century. Study of representative works, discussions and collateral readings. PREREQ: SPAN201.</td>
</tr>
<tr>
<td>SPAN 302</td>
<td>Survey of Spanish Literature</td>
<td>3</td>
<td>Spanish literature from the 18th century to the present. Selection of representative works, discussions and collateral readings. PREREQ: SPAN201.</td>
</tr>
<tr>
<td>SPAN 303</td>
<td>Survey of Spanish-American Literature</td>
<td>3</td>
<td>Representative works in all genres of Latin American literature from pre-Columbian to Modernism. PREREQ: SPAN201.</td>
</tr>
<tr>
<td>SPAN 304</td>
<td>Survey of Spanish-American Literature</td>
<td>3</td>
<td>Representative works in all genres of Latin American literature in the 20th century. PREREQ: SPAN201.</td>
</tr>
<tr>
<td>SPAN 305</td>
<td>Oral Communication</td>
<td>3</td>
<td>For individuals with a comprehensive knowledge of Spanish grammar and vocabulary. Emphasis on refinement of expression of abstract ideas as well as mastery of practical communication. PREREQ: SPAN200. RESTRICTIONS: Not intended for native speakers.</td>
</tr>
<tr>
<td>SPAN 306</td>
<td>Practical Oral/Written Expression</td>
<td>3</td>
<td>Strengths skills in grammar and vocabulary in preparation for advanced courses. Includes oral exposés, discussion of articles and videos, textual analysis and compositions. PREREQ: SPAN200. RESTRICTIONS: Taught abroad only.</td>
</tr>
<tr>
<td>SPAN 308</td>
<td>Contemporary Spain II</td>
<td>3</td>
<td>Discussion and study of issues related to contemporary cultural, political and social developments in Spain, including its place in today's European community. PREREQ: Any two 200-level Spanish courses taught in the Spanish language. RESTRICTIONS: Taught abroad and in Spanish.</td>
</tr>
<tr>
<td>SPAN 325</td>
<td>Spanish Civilization and Culture</td>
<td>3</td>
<td>Survey of geography, history, art and society of Spain. PREREQ: SPAN200.</td>
</tr>
<tr>
<td>SPAN 326</td>
<td>Latin American Civilization and Culture</td>
<td>3</td>
<td>Survey of geography, history, art and society of Latin American lands. PREREQ: SPAN200.</td>
</tr>
<tr>
<td>SPAN 332</td>
<td>Introduction to Business Spanish</td>
<td>3</td>
<td>Introduction of essential business/commercial terminology in common business context. Reinforcing strategies for understanding, interpreting, and responding to new information, and providing opportunities for interactive practice. Familiarizes student with basic policies and practices of the Hispanic business community. Includes writing, conversation, grammar and culture. PREREQ: SPAN200 and SPAN201.</td>
</tr>
<tr>
<td>SPAN 355</td>
<td>Special Topics</td>
<td>3</td>
<td>Explores an area of special interest in Spanish literature or culture studies. Subject matter varies and will be announced in the registration booklet. PREREQ: SPAN201. RESTRICTIONS: May be repeated for credit when topics vary.</td>
</tr>
<tr>
<td>SPAN 366</td>
<td>Independent Study</td>
<td>1-3</td>
<td></td>
</tr>
<tr>
<td>SPAN 370</td>
<td>Studies in Spanish Literature Taught in Spain</td>
<td>3</td>
<td>Presents an historical overview of an area of special interest in Spanish literature or culture studies with emphasis on its cultural and/or cross-cultural context. Topics may include a general survey of Spanish literature from its medieval roots in Latin, Arabic, and Hebrew texts to the multiple influences impacting Spanish literature of the 20th century. PREREQ: SPAN201. RESTRICTIONS: May be repeated for credit when topics vary.</td>
</tr>
<tr>
<td>SPAN 401</td>
<td>Advanced Spanish Grammar II</td>
<td>3</td>
<td>Study and practice of selected problems of written and oral Spanish syntax and vocabulary as well as textual analysis. PREREQ: SPAN500.</td>
</tr>
<tr>
<td>SPAN 403</td>
<td>History of the Spanish Language</td>
<td>3</td>
<td>History of the language from Latin to the present. Historical phonology and morphology. PREREQ: Any 300-level Spanish course.</td>
</tr>
<tr>
<td>SPAN 406</td>
<td>Advanced Spanish Language</td>
<td>3</td>
<td>Advanced grammatical structure and stylistics with special attention given to technical vocabulary and discourse (e.g., business, law, science, agriculture). PREREQ: Any 300-level Spanish course. RESTRICTIONS: Taught abroad only.</td>
</tr>
<tr>
<td>SPAN 415</td>
<td>Latin American Literature and its Political Context</td>
<td>3</td>
<td>Analysis of selected works by contemporary Latin American authors, focusing on the techniques used by these writers to reveal the political upheaval that has affected Latin America in recent years. PREREQ: One SPAN300-level survey of literature.</td>
</tr>
</tbody>
</table>
SPAN 416  Cervantes: Don Quijote  3
The reading of Don Quijote in Spanish, major themes of the book. The life and
times of Cervantes. Antecedents to Don Quijote in Spanish literature. The purpose
of Don Quijote. Introduction to the language of Cervantes.
PREREQ: One SPAN300-level survey of literature

SPAN 417  Hispanic Nobel Prize Authors  3
Covers the works of Spanish and Latin American Nobel Prize authors—
Echegaray, Benavente, Mistral, Jimenez, Austurias, Alexandre, Neruda, Garcia
Marquez, Paz and Cela—in relation to their cultural milieux on the regional,
national and international levels and in relation to their authors' biographies.
PREREQ: One SPAN300-level survey of literature

SPAN 418  God, Man and Woman  3
Analysis of the presentation of God, man and woman in a selection of narrative
poems, dramas and novels from the 15th to the 17th centuries. Authors studied
include Santillana, Diego de San Pedro, Luis de Leon, Zayas and others.
PREREQ: One SPAN300-level survey of literature

SPAN 420  Topics: Medieval Literature  3
Works of one or more authors or of a special theme or genre within Spanish
medieval literature. Example: Love and Passion in the Middle Ages on the Iberian
Peninsula
PREREQ: One SPAN300-level survey of literature

SPAN 421  Spanish Medieval Literature  3
Survey of the major authors and genres of Spanish medieval literature from the
early lyric poetry through narrative poetry, short story, drama, novel to the 15th
century
PREREQ: One SPAN300-level survey of literature course

SPAN 430  Latin American Novel and Cinema  3
Study of a selection of novels of the 20th century which brought international
recognition to Latin American writers. These novelists depict the social, economic,
political and cultural traits of their respective countries. Film versions of some of
the novels illustrate artistic interpretations of the subject matter
PREREQ: One SPAN300-level survey of literature

SPAN 436  Topics: Literature of the Spanish Golden Age  3
Works of one or more authors or of a special theme or genre within Spanish
literature of the Golden Age (16th and 17th centuries)
PREREQ: One SPAN300-level survey of literature course

SPAN 439  Postwar Spanish Narrative  3
The Spanish novel from 1960 to the present. Focuses on novels by leading
authors such as Luis Martin-Santos, Juan Goytisolo, Juan Sastre, Carmen Martin
Goite, Ana Maria Moix and Esther Tusquets. Analysis of these works grounded in
international literary theory and criticism
PREREQ: One SPAN300-level survey of literature

SPAN 440  Topics: Eighteenth and Nineteenth Century Hispanic
Literature  3
Works of one or more authors or of a special theme or genre within Hispanic
literature of the 18th and 19th centuries.
PREREQ: One SPAN300-level survey of literature course

SPAN 447  Contemporary Hispanic Fiction by Women  3
Explores current fiction by women in Spain and Spanish America. Analyzes
selected works as individual literary creations, and also situates them in their
cultural, historical and aesthetic contexts, using appropriate critical
methodologies
PREREQ: One SPAN300-level survey of Spanish literature course

SPAN 450  Topics: Modern Hispanic Literature 1898-1936  3
Works of one or more authors or of a special theme, genre, or topic within
Hispanic literature from 1898 to 1936
PREREQ: One SPAN300-level survey of literature course

SPAN 451  Contemporary Spanish Poetry  3
Analysis of Spanish poetry from Beacquer to the present day.
PREREQ: One SPAN300-level survey of literature

SPAN 452  Advanced Business Spanish  3
Refines basic knowledge of Spanish business/commercial terminology, by helping
students realize the importance of cultural awareness in doing business in Hispanic
countries or with Hispanics in the United States
PREREQ: SPAN200 and SPAN201 SPAN300 and SPAN352 highly recommended

SPAN 454  Introduction to Spanish Cinema  3
Study of modern Spanish cultural history through the films of such masters as
Bardem, Saura, Bunuel, Almodovar, Berlanga, Miro, Amenabar, Medem, Paris,
Feijerman, etc. Relation of these films to Spanish culture, politics, history, and to
European film theory and analysis.
PREREQ: Any 300-level survey of Spanish literature. SPAN325 is strongly
recommended

SPAN 455  Selected Authors, Works and Themes  3
Works of one or more outstanding authors or on a special theme
PREREQ: One 300-level Spanish literature course
RESTRICTIONS: May be repeated for credit when topics vary

SPAN 460  Topics: Contemporary Hispanic Literature
1936—present  3
Works of one or more authors or of a special theme, genre, or topic within
Hispanic literature from 1936 to the present
PREREQ: One SPAN300-level survey of literature course

SPAN 462  Topics: Hispanic Short Fiction  3
Explores short stories and novelas by major writers of the Hispanic world. Each
narrative is analyzed as an individual work of literature and is situated in its
literary, historical and critical contexts
PREREQ: One SPAN300-level survey of literature course

SPAN 464  Contemporary Spanish American Literature by Women  3
Explores twentieth-century fiction by women authors from diverse regions of
Spanish America. Analyzes selected works as individual literary creations and
situates each author in her specific socio-cultural, historical and literary contexts.
PREREQ: One SPAN300-level survey of literature course

SPAN 466  Independent Study  1-3

SPAN 475  Topics: Hispanic Culture and Civilization  3
Study of topics in Hispanic culture and civilization, ranging through the
geography, history, art and society of Spain and Latin American countries
PREREQ: Either SPAN325 or SPAN326

SPAN 484  Contemporary Spanish Theatre  3
Twentieth century Spanish theater as a reflection of and commentary on society.
Principal authors: Garcia Lorca, Buero Vallejo and Sastre.
PREREQ: One SPAN300-level survey of literature

SPAN 601  Advanced Spanish Grammar  3
Study and practice of selected problems of written and oral Spanish syntax and
vocabulary as well as textual analysis

SPAN 603  History of the Spanish Language  3
History of the language from Latin to the present. Historical phonology and
morphology

SPAN 615  Latin American Literature and Its Political Context  3
In-depth analysis of selected works by contemporary Latin American authors,
focuses on techniques used by these writers to reveal the political upheaval that
has affected Latin America in recent years

SPAN 616  Cervantes: Don Quijote  3
The reading of Don Quijote in Spanish; major themes of the book. The life and
times of Cervantes. Antecedents to Don Quijote in Spanish literature. The purpose
of Don Quijote. Introduction to the language of Cervantes

SPAN 617  Hispanic Nobel Prize Authors  3
Studies the works of Spanish and Latin American Nobel Prize authors—
Echegaray, Benavente, Mistral, Jimenez, Austurias, Alexandre, Neruda, Garcia
Marquez, Paz and Cela—in relation to their cultural milieux on the regional,
national and international levels and in relation to their authors' biographies

SPAN 618  God, Man and Woman  3
Analysis of the presentation of God, man and woman in a selection of narrative
poems, dramas and novels from the 15th to the 17th centuries. Authors studied
include Santillana, Diego de San Pedro, Luis de Leon, Zayas and others.

SPAN 620  Topics: Medieval Literature  3
Study of the major authors and genres of Spanish medieval literature from the
early lyric poetry through narrative poetry, short story, drama, novel to the 15th
century

SPAN 621  Spanish Medieval Literature  3
Survey of the major authors and genres of Spanish medieval literature from the
early lyric poetry through narrative poetry, short story, drama, novel to the 15th
century

531
SPAN 630  LATIN AMERICAN NOVEL AND CINEMA 3
Study of a selection of novels of the 20th century which brought international recognition to Latin American writers. These novelists depict the social, economic, political and cultural traits of their respective countries. Film versions of some of the novels illustrate artistic interpretations of the subject matter.

SPAN 636  TOPICS: LITERATURE OF THE SPANISH GOLDEN AGE 3
Works of one or more authors of a special theme or genre within Spanish literature of the Golden Age (16th and 17th centuries).

SPAN 639  POSTWAR SPANISH NARRATIVE 3
Covers the Spanish novel from 1962 to the present. Focuses on novels by leading authors such as Luis Martin-Santos, Juan Goya-Also, Carmen Martin Guitue, and Esther Tusquets. Analysis of these works is grounded in international literary theory and criticism.

SPAN 640  TOPICS: EIGHTEENTH AND NINETEENTH CENTURY HISPANIC LITERATURE 3
Works of one or more authors of a special theme or genre within Hispanic literature of the 18th and 19th centuries.

SPAN 647  CONTEMPORARY HISPANIC FICTION BY WOMEN 3
Explores current fiction by women in Spain and Spanish America. Analyzes selected works as individual literary creations, and also situates them in their cultural, historical and aesthetic contexts, using appropriate critical methodologies.

SPAN 650  TOPICS: MODERN HISPANIC LITERATURE 1898-1936 3
Works of one or more authors of a special theme, genre, or topic within Hispanic literature from 1898 to 1936.

SPAN 651  CONTEMPORARY SPANISH POETRY 3
Analysis of Spanish poetry from Becquer to the present day. Special emphasis on stylics.

SPAN 655  SELECTED AUTHORS, WORKS AND THEMES 3
Works of one or more outstanding authors or on a special theme
RESTRICTIONS: May be repeated for credit when topics vary

SPAN 660  TOPICS: CONTEMPORARY HISPANIC LITERATURE 1936-PRESENT 3
Works of one or more authors of a special theme, genre, or topic within Hispanic literature from 1936 to the present.

SPAN 662  TOPICS: HISPANIC SHORT FICTION 3
Explores short stories and novellas by major writers of the Hispanic world. Each narrative is analyzed as an individual work of literature and is situated in its literary, historical and critical contexts.

SPAN 664  CONTEMPORARY SPANISH-AMERICAN LITERATURE BY WOMEN 3
Explores 20th century fiction by major women authors from diverse regions of Spanish America. Analyzes works as individual literary creations, and situates each author in her specific socio-cultural, historical and literary contexts. Examines the international criticism elicited by each work.

SPAN 675  TOPICS: HISPANIC CULTURE AND CIVILIZATION 3
Study of topics in Hispanic culture and civilization, ranging through the geography, history, art and society of Spain and Latin American countries. PREREQ: Either SPAN325 or SPAN326

SPAN 684  CONTEMPORARY SPANISH THEATRE 3
Twentieth-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Bueno Vallejo and Sastre

SPAN 869  MASTER'S THESIS 1-6

SPAN 875  SEMINAR: TOPICS IN SPANISH LITERATURE 3
Study of selected topics, authors and works in the various fields of Spanish literature. Variable content. Emphasizes preparation of seminar presentations and term papers.
RESTRICTIONS: May be repeated for credit when topics vary.

STAT 366  INDEPENDENT STUDY 1-6

STAT 370  INTRODUCTION TO STATISTICAL ANALYSIS I 3
Basic probability; continuous, discrete and joint distributions; distribution of functions of random variables; order statistics; expected value and central limit theorem
PREREQ: MATH222 or MATH243

STAT 371  INTRODUCTION TO STATISTICAL ANALYSIS II 3
Distributions of common statistics; sampling techniques; estimation, confidence intervals, hypothesis testing and selected topics
PREREQ: STAT370

STAT 409  REGRESSION AND EXPERIMENTAL DESIGN 3
Introduction and overview of inferential methods used in analyzing regression models and linear models for experimental designs
PREREQ: STAT200 or FREC408 or equivalent

STAT 418  SAMPLING METHODS 3
Types of sampling, census vs survey, methods of sample selection, sampling and non-sampling errors. Planning and execution of surveys, and data collection in selected fields of application.
PREREQ: STAT371

STAT 420  DATA ANALYSIS AND NONPARAMETRIC STATISTICS 3
Techniques of exploratory analysis and graphical data analysis for univariate and multivariate data sets, and numerical and categorical variables. Emphasis on exploratory behavior of different statistical techniques with a variety of environmental data sets.
PREREQ: MATH243 and GEOG250
RESTRICTIONS: If STAT420 is taken, degree credit cannot be given for any of the following courses: MATH300, STAT370, STAT371 or MATH450

STAT 601  PROBABILITY THEORY FOR OPERATIONS RESEARCH AND STATISTICS 3
Provides the basic background in probability theory for further work in statistics and operations research. Basic topics: sample spaces and axioms of probability; conditional probability and independence; Bayes theorem; random variables; moments and moment generating functions; transformations of random variables; common families of distributions; multivariate distributions, covariance and correlation; probability inequalities and limit theorems.
PREREQ: MATH243

STAT 602  MATHEMATICAL STATISTICS 3
Derived sampling distributions; decision theory; estimation theory; multivariate normal; hypotheses testing; special topics
PREREQ: STAT601

STAT 603  VECTOR SPACES AND OPTIMIZATION 3
Bases, linear transformations, subspaces, projection theorem, least squares, eigenvalues, eigenvectors, matrix factorizations. Quadratic programming, convexity, duality, Karush-Kuhn-Tucker conditions, constraints, sequential quadratic programming. Linear programming, simplex method, interior point methods
Examples taken from maximum likelihood estimation, robust and ridge regression, resource allocation, transportation problems.
PREREQ: MATH243 and MATH349

STAT 608  STATISTICAL RESEARCH METHODS 3
See FREC608 for course description

STAT 609  REGRESSION AND EXPERIMENTAL DESIGN 3
Introduction and overview of inferential methods used in analyzing regression models and linear models for experimental designs
PREREQ: STAT508 or equivalent

STAT 611  REGRESSION ANALYSIS 3
Simple linear and nonlinear regression. Subset regression; principal component and ridge regression. Introduction to experimental design and design models
PREREQ: MATH202 or STAT371

STAT 612  ADVANCED REGRESSION TECHNIQUES 3
Selected topics in advanced regression analysis
RESTRICTIONS: Requires permission of instructor
STAT 615  DESIGN AND ANALYSIS OF EXPERIMENTS  3
Fundamental principles of design, randomized designs, Latin squares, sources of error, components of error. Factorial designs, response surfaces, models for design
PREREQ: STAT371

STAT 616  ADVANCED DESIGN OF EXPERIMENTS  3
Planning of experiments, designs for specific problems, fractional factorial, quasi-factorial experiments, balanced and unbalanced designs, confounding, introduction to linear estimation.
PREREQ: STAT615

STAT 617  MULTIVARIATE METHODS  3
Multivariate analysis of variance and covariance; classification and discrimination; canonical correlation; principal components; factor analysis.
PREREQ: STAT371

STAT 618  SAMPLING TECHNIQUES  3
Simple random sampling; stratified random sampling; ratio estimates; regression estimates; systematic sampling; cluster sampling; double sampling.
PREREQ: STAT371

STAT 619  TIME SERIES ANALYSIS  3
Fundamental topics in time series analysis—features the Box and Jenkins techniques of fitting time series data. Includes an introduction to appropriate statistical packages.
RESTRICTIONS: Requires permission of instructor

STAT 620  NONPARAMETRIC STATISTICS  3
Statistical procedures valid under unrestrictive assumptions; scales of measurement; efficiency comparisons; signed rank procedures; two-sample rank tests; zeros, ties, and other problems of discrete data; order statistics; k-sample procedures; nonparametric measures of correlation.
PREREQ: STAT371, STAT601

STAT 621  SURVIVAL ANALYSIS  3
Statistical techniques used in the analysis of censored data including the Kaplan-Meier estimator, the analysis of one, two and K sample problems, and regression analysis based on the Cox proportional hazards model
RESTRICTIONS: Requires permission of instructor

STAT 624  ADVANCED TOPICS IN STATISTICS  3
Current statistical and research techniques not covered in other courses.
RESTRICTIONS: Requires permission of instructor.

STAT 635  STATISTICAL QUALITY CONTROL  3
Process variation, sequence plotting, central charts, cumulative sum process control procedures; process capability studies; acceptance sampling; quality control and management, and trouble shooting using graphical techniques.
PREREQ: STAT371

STAT 640  STATISTICAL CONSULTING  3
Topics include the client/consultant relationship; effective communication; identifying the question, developing a plan and presenting the results; following up; actual consulting experience

STAT 641  STATISTICAL LABORATORY  1
Requires attendance at the weekly statistical laboratory meetings.

STAT 656  BIOSTATISTICS  3
An introduction to statistics focused toward applications in biological, medical and other life sciences. Topics include graphical and numerical techniques, random variables and their distribution, estimation and inference.
PREREQ: MATH201

STAT 657  STATISTICS FOR EARTH SCIENCES  3
Spatial distributions; directional data; statistical graphics, regression and time series analysis; model validation; sampling; principal components; cluster analysis; discriminant analysis; and statistical software routines. May be crosslisted with GEOC637.
PREREQ: MATH201

STAT 664  STATISTICS INTERNSHIP  1–6 PF
Supervised on the job experience, performing statistical analysis of problems for clients.
RESTRICTIONS: Requires permission of instructor

STAT 674  APPLIED DATA BASE MANAGEMENT  3
See FREC674 for course description.

STAT 675  LOGISTIC REGRESSION  3
Practical and computational introduction to logistic regression and related topics. Applications include financial, marketing and biomedical research. The use of SAS and other statistical packages will be emphasized.
RESTRICTIONS: Requires permission of instructor

STAT 800  ESTIMATION AND STATISTICAL INFERENCE I  3
Selected topics in estimation and inference such as uniformly most powerful tests, uniformly most powerful unbiased tests, similarity and completeness, sufficiency, likelihood ratio tests, invariant tests, permutation test.
PREREQ: STAT602, MATH602.

STAT 801  ESTIMATION AND STATISTICAL INFERENCE II  3
Further topics in estimation and inference will be covered.
PREREQ: STAT800

STAT 815  LINEAR STATISTICAL INFERENCE I  3
Vector random variables, matrix operations, multivariate normal distributions, distribution of functions of vector random variables, topics from multivariate analysis and specific linear models.
PREREQ: STAT602, STAT615

STAT 819  TIME SERIES ANALYSIS  3
Introduction to fundamental topics in time series analysis featuring analysis in both time and frequency domains. The Box and Jenkins technique of fitting data to autoregressive moving average models will be covered. Emphasis on model building, evaluation and forecasting. Analysis in frequency domain includes such topics as digital filtering and methods of estimating and interpreting the spectrum.
PREREQ: STAT602

STAT 824  ADVANCED TOPICS IN STATISTICS I  3
A presentation of a current area of statistical application or research. Examples of topics which may be covered include: biometry, bootstrapping, data analysis, response surfaces, survival analysis and time series.
PREREQ: STAT816

STAT 831  TIME SERIES ANALYSIS  3
Introduction to fundamental topics in time series analysis featuring analysis in both time and frequency domains. The Box and Jenkins technique of fitting data to autoregressive moving average models will be covered. Emphasis on model building, evaluation and forecasting. Analysis in frequency domain includes such topics as digital filtering and methods of estimating and interpreting the spectrum.
PREREQ: STAT602 and either STAT611 or STAT617

STAT 840  STATISTICAL COMPUTING  3
PREREQ: STAT602 and knowledge of Fortran or equivalent

STAT 852  ADVANCED TOPICS IN MATHEMATICAL STATISTICS  3
Selected topics: Sequential methods, reliability theory, multivariate contingency tables, large sample theory, density estimation, robust and nonparametric estimation.
RESTRICTIONS: Requires permission of instructor

STAT 969  DOCTORAL DISSERTATION  1–12 PF

THEATRE

THEA 102  INTRODUCTION TO PERFORMANCE  3
A survey of performance training techniques for the non-minor, including the elements of voice, improvisation, movement, dance, character analysis and portrayal.

THEA 104  INTRODUCTION TO THEATRE AND DRAMA  3
Survey of the elements of theatre and drama. Includes attendance at theatrical productions, readings of representative plays, discussion of a method of dramatic analysis, explanation of staging in periods of major importance and discussion of the actor, the designer and the director.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 106</td>
<td>THEATRICAL EXPERIENCE ABROAD</td>
<td>3</td>
<td>Survey of the elements of performance, theatre and drama in relationship to observed field performances. Attendance at rigorous program of theatrical performances. Studies elements of voice, improvisation, movement, dance, character analysis and portrayal specifically based on observed performances. Restrictions: Offered abroad.</td>
</tr>
<tr>
<td>THEA 200</td>
<td>INTRODUCTION TO THEATRE PRODUCTION</td>
<td>3</td>
<td>Processes involved in the production of scenery, properties, lighting, sound and costumes for live performance events. Plays read and analyzed for production requirements. Restrictions: Mandatory attendance at performance events.</td>
</tr>
<tr>
<td>THEA 202</td>
<td>INTRODUCTION TO THEATRE DESIGN</td>
<td>3</td>
<td>Survey of the evolution of design theory and aesthetics for live production. Elements include the design of scenery, properties, costumes, lighting and sound. Plays read and analyzed for design requirements. Restrictions: Mandatory attendance at performance events.</td>
</tr>
<tr>
<td>THEA 203</td>
<td>INTRODUCTION TO COSTUMING</td>
<td>3</td>
<td>Explores the evolution of costume design and technology. Discusses and analyzes all aspects of costumes through reading of plays.</td>
</tr>
<tr>
<td>THEA 204</td>
<td>INTRODUCTION TO VOICE AND SPEECH</td>
<td>3</td>
<td>The use of voice and speech in performance. Includes exercises to develop relaxation, breath support, resonance, vocal strength, optimum pitch and articulatory precision, as well as studies in basic vocal anatomy. Studio format. Restrictions: Involves some strenuous physical activity.</td>
</tr>
<tr>
<td>THEA 206</td>
<td>INTRODUCTION TO DANCE</td>
<td>3</td>
<td>Examines the function and impact of dance in the lives of individuals, societies, and cultures. Lecture and participatory format.</td>
</tr>
<tr>
<td>THEA 207</td>
<td>TECHNICAL PRODUCTION PRACTICUM</td>
<td>1-4</td>
<td>Laboratory course for the production of scenery, properties, lighting and sound for public performances of the Professional Theatre Training Program Productions.</td>
</tr>
<tr>
<td>THEA 209</td>
<td>COSTUME PRODUCTION PRACTICUM</td>
<td>1-4</td>
<td>Laboratory course for the production of costumes and costume crafts for public performances of the Professional Theatre Training Program Productions.</td>
</tr>
<tr>
<td>THEA 226</td>
<td>FUNDAMENTALS OF ACTING</td>
<td>3</td>
<td>Exploration of basic elements of the actor's art and craft so as to deepen and broaden the experience of viewing the theatre. May utilize theatre games, basic text work, improvisation and lecture/demonstrations.</td>
</tr>
<tr>
<td>THEA 236</td>
<td>FUNDAMENTS OF JAZZ DANCE</td>
<td>3</td>
<td>Jazz Dance as an art form and vehicle for individual and group expression. Emphasis on rhythm and style. Restrictions: Previous dance experience recommended.</td>
</tr>
<tr>
<td>THEA 300</td>
<td>FUNDAMENTALS OF STAGECRAFT</td>
<td>3</td>
<td>Concentrates on traditional techniques used in the construction and rigging of scenery and properties for the stage. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. Prerequisites: THEA 200 or THEA 202.</td>
</tr>
<tr>
<td>THEA 301</td>
<td>FUNDAMENTALS OF PROPERTIES CONSTRUCTION</td>
<td>3</td>
<td>Introduces basics of organization and management of properties for a theatrical production in addition to basic techniques of property construction. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. Prerequisites: THEA 200 or THEA 202.</td>
</tr>
<tr>
<td>THEA 302</td>
<td>FUNDAMENTALS OF STAGE LIGHTING</td>
<td>3</td>
<td>Introduces basic techniques and processes used in the lighting of theatrical productions. Emphasis on the use and manipulation of lighting equipment. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. Prerequisites: THEA 200 or THEA 202.</td>
</tr>
<tr>
<td>THEA 303</td>
<td>FUNDAMENTALS OF SCENE PAINTING</td>
<td>3</td>
<td>Introduction to the tools, materials, and techniques of painting scenery for the stage. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. Prerequisites: THEA 200 or THEA 202.</td>
</tr>
<tr>
<td>THEA 304</td>
<td>FUNDAMENTALS OF AUDIO FOR THE STAGE</td>
<td>3</td>
<td>Introduces the physical phenomenon of sound and the techniques of controlling and manipulating it for theatrical productions. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. Prerequisites: THEA 200 or THEA 202.</td>
</tr>
<tr>
<td>THEA 305</td>
<td>FUNDAMENTALS OF COSTUME CONSTRUCTION FOR THE STAGE</td>
<td>3</td>
<td>Introduces basic costume construction techniques through lectures, demonstrations, and laboratory experience. Concludes in the construction of a finished costume. Prerequisites: THEA 203.</td>
</tr>
<tr>
<td>THEA 306</td>
<td>FUNDAMENTALS OF PATTERNMKING FOR THE STAGE</td>
<td>3</td>
<td>Teaches basic patternmaking techniques required in costume production. Examines historical details used for period theatrical garments. Prerequisites: THEA 203.</td>
</tr>
<tr>
<td>THEA 307</td>
<td>FUNDAMENTALS OF DRAPING FOR THE STAGE</td>
<td>3</td>
<td>Teaches basic draping skills and applies them to period costumes. Examines historical periods commonly used in theatrical productions. Students create muslin or finished garments from at least four historical periods. Prerequisites: THEA 203.</td>
</tr>
<tr>
<td>THEA 308</td>
<td>FUNDAMENTALS OF COSTUME CRAFTS</td>
<td>3</td>
<td>Provides basic experience in several crafts-related areas commonly utilized in costume making, including mask making, surface design, hat making, leather work and thermoplastics. Prerequisites: THEA 203.</td>
</tr>
<tr>
<td>THEA 309</td>
<td>FUNDAMENTALS OF STAGE MANAGEMENT</td>
<td>3</td>
<td>Study of the techniques and procedures used in managing theatrical productions from conception through performance. Prerequisites: THEA 200 or THEA 202.</td>
</tr>
<tr>
<td>THEA 310</td>
<td>FUNDAMENTALS OF MASKMAKING</td>
<td>3</td>
<td>Introduces basic techniques and processes used in making theatrical masks. Includes how to recreate historical masks. Prerequisites: THEA 203.</td>
</tr>
<tr>
<td>THEA 311</td>
<td>FUNDAMENTALS OF SCENE DESIGN</td>
<td>3</td>
<td>Introduces the exploration of conceptual principles underlying the practice of scene design. Explores the use of visual thinking through the manipulation of drafting and drawing with emphasis on line, form, color, and spatial relationships as they relate to the play. Some artistic ability is helpful. Prerequisites: THEA 200 or THEA 202, or permission of instructor.</td>
</tr>
<tr>
<td>THEA 341</td>
<td>THEATRE/DRAMA: CLASSIC/ENGLISH</td>
<td>3</td>
<td>Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT 341.</td>
</tr>
<tr>
<td>THEA 342</td>
<td>THEATRE/DRAMA: RENAISSANCE TO 1700</td>
<td>3</td>
<td>Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT 342.</td>
</tr>
<tr>
<td>THEA 343</td>
<td>THEATRE/DRAMA: 1700 TO 1900</td>
<td>3</td>
<td>Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT 343.</td>
</tr>
<tr>
<td>THEA 344</td>
<td>THEATRE/DRAMA: 1900 TO PRESENT</td>
<td>3</td>
<td>Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT 344.</td>
</tr>
<tr>
<td>THEA 345</td>
<td>HISTORY OF THEATRE: AMERICAN MUSICAL THEATRE</td>
<td>3</td>
<td>See MUSC 345 for course description.</td>
</tr>
<tr>
<td>THEA 347</td>
<td>SPECIAL TOPICS IN THEATRE HISTORY</td>
<td>3</td>
<td>A series of changing topics in history and theory. Topics range from studies of significant movements in theatre to the study of theoretical issues and individual playwrights and genres.</td>
</tr>
<tr>
<td>THEA 360</td>
<td>FUNDAMENTALS OF ORAL INTERPRETATION</td>
<td>3</td>
<td>Basic course in interpretation of text for the stage. Concentrates on texts from plays; explores prose and poetry. Emphasis on diction, meaning and presentation. Studio format.</td>
</tr>
<tr>
<td>THEA 366</td>
<td>INDEPENDENT STUDY</td>
<td>1-6</td>
<td></td>
</tr>
</tbody>
</table>
THEA 607 THEATER PRACTICUM FOR MAJORS 1–4

Students assigned production responsibilities on departmental productions in the areas of lighting, sound, scenery, properties, costumes, stage management, painting and theatre management

RESTRICTIONS: Open to majors only. Requires permission of instructor.

THEA 410 FUNDAMENTALS OF DRAMATURGY 3

Topics covered include various methods of dramatic and entertainment analysis, scene analysis, development of dramaturgical plot, table and practice. Survey of function and role of the dramaturg in contemporary theatre. Readings in primary and secondary material.

THEA 420 FUNDAMENTALS OF STAGE DIRECTING 3

Exploration of the director's part in the creative process of theatre. Philosophy, techniques and problems of directing plays

PREREQ: THEA 104

THEA 466 INDEPENDENT STUDY 1–6

THEA 490 SEMINAR IN THEATRE AND DRAMA 3

Seminar in theatre and drama. Topics will be announced.

RESTRICTIONS: Requires permission of instructor.

THEA 600 DISTINCTIONS OF PROFESSIONAL THEATRE PRACTICE 1–3

Inquiry into the nature of the theatre as an art form; techniques and issues of communication, organization, management, leadership team participation and creativity necessary to the pursuit and accomplishment of fulfilling careers in institutional and commercial theatres. Explores how the nature and purpose of the theatre as an art informs the day-to-day practices, values and behavior of the individual artist

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated up to 12 credit hours.

THEA 601 DYNAMICS 1

A vocal/physical warmup. Exercises designed to prepare student for the day's work.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated up to six credit hours.

THEA 602 VOICE DEVELOPMENT I 1

Basic breath control and tone production to develop strength, control, flexibility and awareness

RESTRICTIONS: Requires enrollment in the Professional Theatre Program/Acting or Directing.

THEA 603 VOICE DEVELOPMENT II 1

Continuation of THEA 602

PREREQ: THEA 602

THEA 604 VOICE DEVELOPMENT IIIA 1

Continuation of THEA 603, with an emphasis on range extension and the development of greater variety in expressiveness

PREREQ: THEA 603

THEA 605 VOICE DEVELOPMENT IIIB 1

Continuation of THEA 604

PREREQ: THEA 604

THEA 606 VOICE DEVELOPMENT IIIC 1

Individual instruction to identify habitual vocal patterns and to strengthen individual weaknesses in voice

PREREQ: THEA 605

THEA 607 VOICE DEVELOPMENT IID 1

Continuation of THEA 606

PREREQ: THEA 606

THEA 608 STAGE MOVEMENT I 1

Exercises and assignments to develop alignment, strength, flexibility, control, awareness, endurance, rhythmic sensitivity, balance and expressiveness

RESTRICTIONS: Requires enrollment in the Professional Theatre Program/Acting or Directing.

THEA 609 STAGE MOVEMENT II 1

Continuation of THEA 608

PREREQ: THEA 608

THEA 610 STAGE MOVEMENT III 1

Continuation of THEA 609, with an emphasis on stage combat, tumbling, circus and other advanced movement techniques

PREREQ: THEA 609

THEA 611 STAGE MOVEMENT IIIB 1

Continuation of THEA 610

PREREQ: THEA 610

THEA 612 STAGE MOVEMENT IIIC 1

Individual instruction to identify habitual movement patterns and to strengthen individual weaknesses in stage movement.

PREREQ: THEA 611

THEA 613 STAGE MOVEMENT IIIB 1

Continuation of THEA 612

PREREQ: THEA 612

THEA 614 STAGE SPEECH I 1

Ear training and phonetics. Corrective work on regional speech habits

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting or Directing.

THEA 615 STAGE SPEECH II 1

Continuation of THEA 614. Beginning work on verse scansion

PREREQ: THEA 614

THEA 616 STAGE SPEECH II 1

Continuation of THEA 615 with an emphasis on phrasing and verse scansion

PREREQ: THEA 615

THEA 617 STAGE SPEECH III 1

Continuation of THEA 616

PREREQ: THEA 616

THEA 618 STAGE SPEECH IIIA 1

Stage dialects and advanced work in phrasing and verse scansion. Individual tutoring in problem areas

PREREQ: THEA 617

THEA 619 STAGE SPEECH IIIB 1

Continuation of THEA 618

PREREQ: THEA 618

THEA 620 REHEARSAL AND PERFORMANCE/ACTING 1–6

Practical instruction and assignments in the preparation, rehearsal and performance of theatrical productions

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting. May be repeated up to 24 credit hours.

THEA 633 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES I 1–2

Development of organizational structuring and communication techniques for the administration of stage managerial projects

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management

THEA 634 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES II 1–2

Further development of organizational structuring and communication techniques for the administration of stage managerial projects

PREREQ: THEA 633

THEA 635 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES III 1–2

Development of organizational structuring and communication techniques for the administration of stage managerial projects

PREREQ: THEA 634

THEA 636 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIIA 1–2

Further development of organizational structuring and communication techniques for the administration of stage managerial projects

PREREQ: THEA 635

THEA 638 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIIIB 1–2

Further development of organizational structuring and communication techniques for the administration of stage managerial projects

PREREQ: THEA 637

THEA 639 STAGE MANAGEMENT PRODUCTION SKILLS I 1–2

Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management
THEA 640 Stage Management Production Skills IB 1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA639

THEA 641 Stage Management Production Skills IIA 1-2
Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA640

THEA 642 Stage Management Production Skills IIIB 1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA641

THEA 644 Stage Management Production Skills IIIC 1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA643

THEA 645 Rehearsal and Performance/Stage Management 1-5
Practical instruction and assignments in the preparation, rehearsal and performance of theatrical productions.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management. May be repeated up to 24 credit hours.

THEA 648 Costume Construction 1
Introductory course exploring the mechanics and technology of the art of costuming. Surveys all aspects of the costumer's craft including practical work in the costume shop.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Construction.

THEA 664 Internship in Professional Theatre 1-9
Engagement with professional theatre in individual discipline area.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated up to 18 credit hours.

THEA 665 Theatre Literacy 2
Discussion, research, and practice in theatre terminology, literature and history.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated up to 12 credit hours.

THEA 668 Research 1-6

THEA 674 Scenery Production 1
Materials, tools, hardware and construction methods used for scenery construction. Emphasis on traditional scenic construction with wood as the primary material.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 675 Properties Production 1
Concentrates on property production techniques with emphasis on properties management, acquisition, and health and safety.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 676 Scenery/Metalworking 1
Materials, tools and methods of working with metal for scenery construction.
PREREQ: THEA674

THEA 677 Properties Production II 1
Tools, materials and methods for upholstery and drapery, casting, mold-making, and other properties techniques.
PREREQ: THEA675

THEA 679 Scenery/Stage Rigging 1
Tools, hardware and methods of rigging scenery. Emphasis on standard theatre rigging systems.
PREREQ: THEA674

THEA 680 Lighting Production 1
Electrical theory and practice as applied to theatre production. Emphasis on current lighting production practice, systems and equipment.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 681 Audio Production 1
Sound theory and practice as applied to contemporary theatre production. Emphasis placed on utilizing current systems, equipment and technology for audio production.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program/Technical Production

THEA 682 Lighting Design 1
Essential skills and procedures for creating, documenting and realizing a lighting design for a theatrical production.
PREREQ: THEA680

THEA 683 Production Project Management 1
Examines how project management techniques are applied to technical production. Techniques for project analysis, priority setting, scheduling, resource allocation and project tracking will be examined.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 684 Technical Production Seminar 1
Investigation and discussion of technical problems and issues encountered in productions.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production. May be repeated up to six credit hours.

THEA 686 Information Technologies for Theatre 1
Application of computer software to theatrical production practice. Emphasis is placed on CAD (drafting) techniques for theatre production.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 687 Scenery Painting 1
Painting tools, materials, color theory and scenery painting techniques for theatrical production.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program/Technical Production.

THEA 688 Computer Aided Drafting and Scenery Construction 1
Continued work on CAD (drafting) with emphasis on construction work drawings for scenery construction. Further study of standard and specialized scenery construction methods.
PREREQ: THEA686

THEA 692 Production and Performance/Technical 1-6
Practical instruction and assignments in the technical preparation and production of Professional Theatre Training Program public performances. Assignments may be repeated up to 20 credit hours.

THEA 693 Production Seminar 1
Development of management and communication techniques for effective interaction among stage management, costume production and technical production areas of theatre. May be repeated up to six credit hours.

THEA 694 Special Topics in Theatre Production 1-3
Multiple units on advanced topics in theatre production and management.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated up to nine credit hours.

UAPP 601 Measuring and Defining Planning Problems 1
Methods for identifying and measuring planning-related problems, including analyses of land use patterns, population dynamics, economic trends, social indicators, and ecological characteristics as predictors and determinants of future development.

UAPP 602 Introduction to Comprehensive Planning 1
Overview of the comprehensive planning process. Description of goals, objectives and components behind the development of a comprehensive plan and methods for preparing and understanding the value of a comprehensive plan to the community.

UAPP 603 Introduction to Zoning and Land Use Controls 1
Survey of the theories underlying land use patterns and description of the legal structure and methods surrounding public sector control and management of land use including police power, eminent domain, zoning, subdivision control, and master plans.
UAPP 604 LEADERSHIP IN ORGANIZATIONS 3
Understanding the process of change and positively affecting change in organizations through the exercise of leadership skills and knowledge.

UAPP 605 TOPICS IN URBAN AFFAIRS 3
Focuses on selected topics in urban affairs such as urban politics and government, urban education and neighborhood analysis.

RESTRICTIONS: May be repeated up to nine credits when topics vary.

UAPP 606 LOCAL ECONOMIC DEVELOPMENT: POLICY AND PRACTICE 3
Examines theory and contemporary practice for promoting the economic development of local communities. Reviews alternative ways of understanding the dynamics of local economic development and devising strategies that will benefit community residents.

UAPP 607 SEMINAR IN COMMUNITY DEVELOPMENT AND NONPROFIT LEADERSHIP 1
Examines the complex ways in which the concepts of community analysis and development are used and understood. May be cross-listed with IST607.

UAPP 608 POVERTY, NEIGHBORHOODS AND COMMUNITY DEVELOPMENT 3
Examines social science literature through which multidisciplinary analysts have described and explained poverty, analyzed neighborhoods, and categorized community development efforts. Focusing on the United States, particular attention is paid to analyses from 1960 to the present. May be cross-listed with IST608.

UAPP 609 FINANCIAL STATEMENT ANALYSIS FOR NONPROFITS 1
Geared toward graduate students with little or no background in accounting or reading financial statements. Intent is to give basic understanding of financial statement analysis. Will cover basic accounting concepts with an emphasis on understanding the financial statements of nonprofit organizations.

UAPP 610 URBAN LAND USE PLANNING AND ADMINISTRATION 3
Interaction of political, economic and social forces in the planning and land use control process. Emphasis on planning agency administration and current policies impacting the planning process, including recently enacted environmental and community development legislation. Concern for the role of the planner, the planning agency and the planning function as it relates to economic and community development.

UAPP 611 REGIONAL WATERSHED MANAGEMENT 3
Reviews the practical applications of watershed planning as a tool to manage land, water and ecosystem resources. Explores public policies and practices of watershed planning by examining case studies. Uses a multidisciplinary approach involving the fields of geography, environmental science, geology, public policy, land planning, geographic information systems (GIS) and engineering.

May be cross-listed with FREC611.

UAPP 612 URBAN HOUSING POLICY AND ADMINISTRATION 3
Examines problems associated with providing adequate and affordable housing in the United States. Covers the structure and dynamics of the housing market; supply and demand factors; market failure; financing methods; federal, state and local public policy affecting housing, including taxation, regulation, subsidy programs, and land use controls.

UAPP 613 PLANNING THEORY AND URBAN POLICY 3
Provides an overview of the development and current conceptual normative and methodological issues in planning theory as applied to urban regions.

UAPP 614 THE AMERICAN SUBURB 3
An examination of the historical and geographical origins of the American suburb and its role in metropolitan development and larger society. Includes the evolution of the streetcar and automobile suburbs with special emphasis on the post World War II suburban boom and contemporary post-suburban trends.

May be cross-listed with GEOG614 and/or HIST614.

UAPP 615 URBAN, REGIONAL AND ENVIRONMENTAL PLANNING 3
Provides an introduction to urban planning. Focuses mainly on U.S., but some comparisons made with Britain and Canada. Issues covered include zoning, urban growth management, land policies, regional policies and urban policy.

May be cross-listed with GEOG615.

UAPP 616 VOLUNTEER MANAGEMENT 1
Provides an introduction and overview of the field of volunteer administration, explores the components of the effective management of volunteers and builds students' problem solving skills. Comparisons to the management of paid staff and the role of volunteerism in the larger organizational structure.

UAPP 617 CONTEMPORARY ISSUES IN ENVIRONMENTAL AND ENERGY POLICY 1
Links students with leading energy and environmental policy scholars on a bi-weekly basis to debate key issues such as global warming, ozone layer deterioration, environmental justice, sustainable development and ecological democracy. International, national and community dimensions of these and other policy issues are explored through seminar discussion.

UAPP 618 HUMAN SERVICE SYSTEMS: POLICY, PRACTICES, ADMINISTRATION 3
Centers on operational practices and administration of human service systems. Includes an analysis of human service systems concepts and policies, delivery practices and administration. Human service systems dimensions reviewed in relation to the rising influence of organized human service professional (practitioner) groups and organized human service consumer groups.

UAPP 619 CONTEMPORARY ISSUES IN URBAN AFFAIRS AND PUBLIC POLICY 2
Overview of the origins of urban affairs and public policy and its current academic role and status as a profession. Students meet with and engage in discussions with leading scholars and policy makers invited to the campus to talk about their current research and interests.

UAPP 620 CRIMINAL JUSTICE ADMINISTRATION 3
Focuses on issues of concern to students planning careers as administrators in the criminal justice system. Covers administrative policy, organizational dynamics, budgetary matters, and the role of the computer in criminal justice. Explores the complexities, conflicts and ambiguities of criminal justice management.

UAPP 621 CONFLICT RESOLUTION 1
Introduction to conflict resolution skills. Provides communication and problem solving skills designed to de-escalate conflicts and create win-win solutions. Students learn new ways of approaching conflict while gaining an understanding of their own conflict management style. Examines how these skills transfer to the workplace.

RESTRICTIONS: Requires permission of instructor.

UAPP 622 RESOURCES, DEVELOPMENT AND THE ENVIRONMENT 3
See GEOG622 for course description.

UAPP 623 INDEPENDENT STUDY IN GEOGRAPHICAL INFORMATION SYSTEMS 1
Students complete self-paced individualized tutorials and apply knowledge in a project of their choice. Material addressed includes creation and display of digital maps and data bases, preparation of data sets, sources of data and GIS standards.

UAPP 624 SEMINAR IN CRIMINAL JUSTICE 3
Discussion and evaluation of institutional components of criminal justice systems. Topics include police, judicial and corrections systems.

UAPP 625 ENERGY POLICY AND ADMINISTRATION 3
See POSC624 for course description.

UAPP 626 CONSERVATION AND RENEWABLE ENERGY POLICY 3
Covers current policy issues for energy conservation, energy efficiency, and renewable energy sources. Some prior background in energy policy is assumed. Topics include environmental impacts, utility programs, and international comparisons.

May be cross-listed with MAST622 and/or POSC626.

PREREQ: POSC624.

UAPP 627 COMPARATIVE ENVIRONMENTAL POLITICS 3
Examines the effect of institutional and systemic factors in the formulation and implementation of environmental policy in several developed and developing countries. Considers the impact of modes of political participation, level of development, and type of political economy on policy.

May be cross-listed with MAST628 and/or POSC628.

UAPP 628 ISSUES IN LAND USE AND ENVIRONMENTAL PLANNING 3
See GEOG628 for course description.

UAPP 629 SEMINAR IN HISTORIC PRESERVATION 3
Survey of historic preservation and management of cultural resources examining cultural contexts and public policy. Covers techniques of preservation and the legal and legislative basis of conservation programs with particular attention to the National Register of Historic Places.

May be cross-listed with ARTH628, HIST652, and/or MAST629.

UAPP 630 METHODS IN HISTORIC PRESERVATION 4
Upper-level field research seminar concentrating on developing graphic, photographic and narrative skills for architectural documentation and professional skills related to historic preservation. Involves classroom and field sessions.
UAPP 631  DOCUMENTATION OF HISTORIC STRUCTURES  1
Focuses on learning to create scaled, annotated field notes of historic resources in preparation for making measured drawings of the buildings. Students spend all of their time in the field, working as part of a team to record a variety of buildings through plans, sections, elevations and details.

UAPP 632  MAKING THE AMERICAN CITY  3
Advanced research and reading seminar on the material organization of early American cities. Examination of historical and cultural issues related to housing, consumerism, gender, ethnicity, craft, poverty and wealth as means to interpreting the city as artifact and symbolic setting. Includes field trips to cities in the region. Students will work with primary sources including architectural materials, architecture and documentary evidence. May be cross-listed with ARTH632 and/or HIST632.

UAPP 633  ANALYSIS AND INTERPRETATION OF HISTORICAL LANDSCAPES  3
Explores the interpretation of historic vernacular and designed landscapes, with emphasis on application to historic preservation planning. Focuses on the examination of a series of historic American landscapes from eighteenth to twentieth century suburban and industrial environments. Involves a field orientation and individual projects interpreting an historical landscape.

UAPP 634  HOUSING FINANCE AND DEVELOPMENT  3
Fundamentals of real estate and housing finance and the methods available to finance the development of real estate. Financial institutions and institutions involved in each phase. Relevant tax laws and likely tax consequences. Development of public policy as it affects the availability of housing credit: the function, operation and regulation of financial and related institutions, including FHA, FNMA, GNMA, FHLLB and FHLMC.

UAPP 635  THE EVOLUTION OF THE AMERICAN URBAN LANDSCAPE  3
Reading and research seminar on the evolution of the American urban landscape from approximately 1850 to the present. Examination of historical, cultural and geographical issues and processes related to industrialization and capitalism, technology, gender and race, housing, poverty and wealth as means of understanding the formation of the historic American urban landscape. Includes field trips to cities in the region. May be cross-listed with GEOG635 and/or HIST635.

UAPP 636  RESEARCH TOPICS IN HISTORIC PRESERVATION  3
Seminar that addresses a specific research issue within historic preservation including hypothesis construction, design of research methodology and evaluation of results. Emphasis on the use of primary sources and application of database techniques. May be cross-listed with ARTH622, GEOG636, and/or HIST636.

UAPP 637  ORGANIZING FOR SOCIAL JUSTICE  1
An analysis and comparison of four contemporary types of organizing styles used in the United States; examining their ideologies, methods of application, theories of change, and expected outcomes relative to initiatives to change, propose, and/or oppose social, economic and political policies and practices.

UAPP 638  WORLD CITIES IN COMPARATIVE PERSPECTIVE  3
See GEOG638 for course description.

UAPP 639  COMMUNITY DEVELOPMENT THEORY, CONCEPTS AND PRACTICE  3
Explores the evolution of core principles and concepts associated with community development, examines various models of practice, and identifies and assesses current challenges and issues confronting the field in the United States.

UAPP 640  INTERNATIONAL AND DEVELOPMENT ADMINISTRATION  3
See POSC640 for course description.

UAPP 641  TOPICS IN NONPROFIT MANAGEMENT AND LEADERSHIP  3
Offers an additional and advanced opportunity to delve into nonprofit management and leadership in the context of the current sociopolitical and economic environment. Expands knowledge and understanding of the issues confronting the sector to a deeper level and builds analytical and problem-solving skills.

UAPP 642  STRATEGIC PLANNING FOR PUBLIC AND NONPROFIT ORGANIZATIONS  1
Provides an introduction to the process of strategic planning and attempts to build the skills and knowledge required for carrying out strategic planning in private nonprofit and public agencies. Focuses on the organizational environments in which planning takes place, examines the theories which underlie planning in general and strategic planning in particular and presents a usable model for strategic planning.

UAPP 644  GRANTSMANSHIP AND PROPOSAL WRITING  1
Helps public and nonprofit managers hone their abilities to successfully secure grant funding. Sessions cover currently available resources for identifying promising targets for one's grant proposals, do's and don'ts in dealings with foundations, what grantmakers really look for in a winning grant proposal, and strategies for transforming an idea into a feasible proposal capable of effectively attracting grant support.

UAPP 645  CIVIC ENGAGEMENT  3
Provides both hands-on experience and skill-building in engaging community groups in planning and implementing civic engagement initiatives that address government and nonprofit decision-making; and, the opportunity to examine and explore concepts and philosophies that support civic engagement, collaborative leadership, and facilitative participation.

UAPP 646  ADMINISTRATIVE LAW  3
Introduces the basic concepts and rules of administrative law and of the legal issues affecting public and nonprofit organizations in dealing with governmental agencies. Special attention placed on the impact politics has on efforts by administrators to comply with administrative law rules and regulations. No prior legal training or command of legal language necessary. May be cross-listed with LEG646.

UAPP 647  PHILOSOPHY OF TECHNOLOGY  3
See PHIL647 for course description.

UAPP 648  ENVIRONMENTAL ETHICS  3
See PHIL648 for course description.

UAPP 649  CIVIL RIGHTS LAW AND POLICY  3
Examines the origin and evolution of the laws and policies that govern the rights of African-Americans and other people of color in the United States. Examines emerging approaches to civil rights scholarship and considers the implications of the Supreme Court's recent embrace of a conservative posture in civil rights issues. May be cross-listed with BAM649 and/or LEG649.

UAPP 650  VALUES AND ETHICS OF LEADERSHIP  3
Looks at the "ends" served by leaders in various contexts (including government, nonprofits, business, and media) and the ethical standards by which the leaders' actions are judged. Examines cases of unethical conduct as well as cases of exemplary conduct.

UAPP 651  MANAGING RISK AND SECURITY  1
Examines the policy agenda regarding risk reduction during a time of increasing threats to safety and security. Readings and presentations by practitioners introduce public entity and intergovernmental risk assessment and response strategies. Topics include information system development, exposure reduction, loss prevention, incident management, and resource coordination.

UAPP 652  GEOGRAPHIC INFORMATION SYSTEMS IN PUBLIC POLICY  1
Hands-on introduction to Geographic Information Systems (GIS) and their uses in public policy areas. Content varies. Exercises focus on using geographic data in fields such as environmental analysis, land use planning, and socio-economic analysis.

UAPP 653  POLITICS AND HEALTHCARE  3
See POSC653 for course description.

UAPP 654  VERNACULAR ARCHITECTURE  3
See HIST654 for course description.

UAPP 655  GEOGRAPHIC INFORMATION SYSTEMS IN THE PUBLIC AND NONPROFIT SECTOR  3
Introduction to the use of Geographic Information Systems (GIS) in urban planning and water-resources fields. Emphasis on practical experience in developing research methodologies employing GIS techniques. Topics include data/metadata creation, remote sensing as it relates to GIS, cartographic representation of spatial data, and vector/raster spatial modeling. No previous GIS experience required.

UAPP 656  POLITICS AND DISASTER  3
See POSC656 for course description.

UAPP 657  HEALTH POLICY  3
Provides students with a basic understanding of the U.S. health system and gives them practical experience in analyzing how healthcare reform and health policy more generally affect various sectors of the economy.

UAPP 658  CONTEMPORARY ISSUES IN PUBLIC ADMINISTRATION  1
Focus on "cutting edge" issues in the field of public administration and public affairs, including the response of those in public administration as they seek to establish more clearly the role of administrators in the governance process.
UAPP 659  TOPICS IN PUBLIC ADMINISTRATION  1-3
Focuses on micro and macro public administration issues, i.e., privatization, health care cost containment, flexible benefits packages, ethics, organizational productivity, concession and productivity bargaining. May be cross-listed with POSC659.

UAPP 660  SEMINAR IN URBAN MANAGEMENT  3
Provides a theoretical and conceptual orientation to urban management perspectives on the development of urban management as a profession, a description of the intergovernmental, sociopolitical and economic environment of urban management, and analyses of current issues in the area.

UAPP 661  COMPARATIVE PUBLIC ADMINISTRATION AND POLICY  1
Examines contemporary experience in public administration and policy in other cultures and systems.

UAPP 662  MUNICIPAL MANAGEMENT  3
Surveys the major operational functions of local government with emphasis on the practical elements and problems in the management of these functions. Functions include solid waste disposal; economic development; planning and land use control; water supply; police and emergency services; and cultural, social, and recreational services. Emphasis on innovative approaches to the provision of services.

UAPP 663  DECISION TOOLS FOR POLICY ANALYSIS  3
See MAST663 for course description.

UAPP 664  CASE STUDIES IN STATE AND LOCAL MANAGEMENT  3
Uses analyses of cases in state and local decision making to enable students to improve their communication, decision making and management skills. Cases deal with a broad range of subject areas (e.g., health and recreation) and problems (e.g., facility location and personnel).

UAPP 666  SPECIAL PROBLEM  1-12
Introduction to the principles of fund development, a guide to organizing for fund development, and an overview of the fundamentals of annual, major and planned fundraising from individuals.

UAPP 670  FUND DEVELOPMENT: FUNDRAISING FROM INDIVIDUALS  1
Introduction to the principles of fund development, a guide to organizing for fund development, and an overview of the fundamentals of annual, major and planned fundraising from individuals.

UAPP 671  FUND DEVELOPMENT: FUNDRAISING FROM INSTITUTIONS  1
The second in a series of three, one-credit courses which focuses on corporate, foundation and government fund development activity in support of the nonprofit organization. Includes presentations by practitioners from the corporate, foundation and government sectors, helping students to understand the issues from the perspective of the funding sources and from professional fundraisers on identifying potential donors through research.

UAPP 675  LAND USE AND TRANSPORTATION LINKAGES  1
Explores the linkages between land use planning and the provision of transportation infrastructure. Discussions include guest speakers who are recognized practitioners in the fields of land use and transportation planning. Land development techniques and patterns which influence transportation needs are covered. Shows how the interplay between land use patterns and transportation infrastructure influences travel and development characteristics.

UAPP 676  SURVEY RESEARCH  1
Introduces the major concepts of survey research to include questionnaire development, sampling, survey management, quality control, and analytical concerns. Follows all aspects of pre-election polling undertaken by Center for Applied Demography and Survey Research during the semester.

UAPP 677  PLANNING INFORMATION TECHNOLOGY - ENHANCED PROJECTS  1
Introduces the issues surrounding planning for projects requiring the acquisition and application of technology in the public and nonprofit sectors. Focuses on three themes that impact the adoption, implementation, and evaluation of information technology (IT) efforts: technology, policy, and administration.

UAPP 678  ADMIRALTY AND MARITIME LAW  3
See MAST678 for course description.

UAPP 679  VIRTUAL GOVERNMENT  1
Explores the evolving field of E-government and evaluates opportunities to enhance the delivery of government services. Reviews developments throughout the world and strategies for implementation in Delaware.

UAPP 680  MYERS-BRIGGS AND PERSONAL DEVELOPMENT  1
Emphasis is on an intensive understanding of the elements of the Myers-Briggs Type Indicator (MBTI) indexes as they apply to individuals. Includes the application to and opportunity for individual development, conflict, communication, change and leadership. Although not as rigorous as the full qualifying program, it offers a thorough understanding and direct application to many other areas that impact individuals personally.

UAPP 681  METROPOLITAN INFRASTRUCTURE AND TRANSPORTATION  3
Movement is essential for metropolitan area performance. Roads and water systems are infrastructure components that impact on where houses, stores, and jobs are located; which in turn links into movement, pollution and congestion. This course treats infrastructure decision making using approaches from public economics. May be cross-listed with POSC681.

UAPP 682  MYERS-BRIGGS AND EFFECTIVE ORGANIZATIONS  1
Explores the "Type" of organizations, how to build effective teams and how to work with people who are not just like we are.

UAPP 683  REGIONAL POLICY ANALYSIS  3
Why do some regions cities grow and change? Course presents theories of regional development, methods of inter-regional analysis, as well as internal-regional topics such as land use, migration, city-suburban shifts, and neighborhoods. Various kinds of regional policies are analyzed.

UAPP 684  PERFORMANCE MANAGEMENT  3
Increases the knowledge of techniques and definitions used in the managing-for-results movement; introduces the indicators used by government and their use for accountability and improved effectiveness; furthers competence in the areas of strategic planning, benchmark indicators, performance-based budgeting, and performance measurement; and explores linkages and alignments of systems for improved efficiency and effectiveness.

UAPP 685  PERSONNEL AND HUMAN RESOURCE ISSUES: CURRENT TOPICS  3
Analysis of selected policies, practices, and issues currently important in the field of public personnel/human resources. Topics vary depending on instructor. Illustrations: EEO developments, "Glass Ceiling" issues, ADA, benefits/cost containment, labor negotiation trends, the changing workplace and workplace).

UAPP 686  STATE AND LOCAL GOVERNMENT: CONCEPT AND ISSUES  3
Explores the state and local government context in which public managers work. Examines the organizational, administrative, and economic forces shaping state and local public action, as well as the political decision making apparatus used by subnational governments. Assesses their contemporary role in the federal system.

UAPP 687  STATE GOVERNMENT POLICY AND MANAGEMENT  3
Focuses on roles and functions of United States state government. Topics include legislative policy making and operations, executive branch organization and functions, structure and role of state courts, and the role of the governor and the states in intergovernmental policy making. State government in the mid-Atlantic region will receive special attention.

UAPP 688  TOPICS IN STATE AND LOCAL MANAGEMENT  3
Focuses on selected topics in state and local management and policymaking. May include in-depth exploration of management processes/structures (e.g., budgeting) and/or contemporary policy issues (e.g., educational reform, environmental crises) within state and local government with which public managers must contend.

UAPP 692  ENVIRONMENTAL VALUES, MOVEMENTS AND POLICY  3
See MAST692 for course description.

UAPP 800  RESEARCH METHODS AND DATA ANALYSIS  4
Focuses on concepts, issues and techniques related to research design, data acquisition and data analysis in the fields of urban affairs and public policy.

UAPP 801  PROCESSES OF SOCIAL INQUIRY  3
Explores the philosophical underpinnings of social inquiry and epistemological and methodological issues surrounding the development and use of social research. Encourages students to consider the role of critical analysis in social change. Students prepare research designs on topics of their choosing and are assisted by the instructors in developing them into thesis and dissertation proposals.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAPP 802</td>
<td>Electricity Policy and Planning</td>
<td>3</td>
<td>Analyzes the technological and regulatory policy evolution of the electricity industry. Considers how technology innovations and policy/ regulatory actions have guided the planning of the industry from its early days.</td>
</tr>
<tr>
<td>UAPP 803</td>
<td>Seminar: Public Administration</td>
<td>3</td>
<td>Reading and discussion of theories and problems of public administration, including organization, coordination, field administration, contracts, personnel, policy making, participation, adjudication, budgeting and administrative behavior. May be cross-listed with POSC803.</td>
</tr>
<tr>
<td>UAPP 804</td>
<td>Program Evaluation for Health and Social Services</td>
<td>3</td>
<td>Introduces quantitative and qualitative methods for evaluating health and social service programs. Emphasizes program design evaluation, process evaluation, experimental and quasi-experimental design, and clinical trials.</td>
</tr>
<tr>
<td>UAPP 806</td>
<td>Survey Research</td>
<td>3</td>
<td>Methods and procedures for the design, administration and analysis of sample surveys.</td>
</tr>
<tr>
<td>UAPP 808</td>
<td>Qualitative Methods for Program Evaluation</td>
<td>3</td>
<td>Provides skills and exposure to issues in the use of qualitative methods in the context of program evaluation. Qualitative design, sampling approaches, data collection, and analysis are included.</td>
</tr>
<tr>
<td>UAPP 810</td>
<td>Political Economy of the Environment</td>
<td>3</td>
<td>Reviews major theories developed over the last half century to explain nature-society relations. Policy case studies on environmental justice, trade and environment, global climate change, and sustainable development are used to evaluate the current range of political-economic explanations of nature-society relations. International, national, and local responses to these problems are analyzed. May be cross-listed with MAST814 and/or POSC814.</td>
</tr>
<tr>
<td>UAPP 815</td>
<td>Public Management Statistics</td>
<td>3</td>
<td>Emphasis on the practical knowledge of statistical techniques and their use in the management of data (or data systems) in the public sector. Discussion and appraisal of various statistical tools from a theoretical standpoint, and application of statistical methods and procedures in a laboratory situation for the collection, organization and analysis of statistical information in public management research.</td>
</tr>
<tr>
<td>UAPP 816</td>
<td>Advanced Social Statistics</td>
<td>3</td>
<td>Provides advanced training in applied social research. Topics include analysis of variance, regression analysis, analysis of covariance, multi-dimensional cross-classifications and future analysis. Lectures supplemented by laboratory work involving computer statistical packages and simulations.</td>
</tr>
<tr>
<td>UAPP 817</td>
<td>Public Investment Policy</td>
<td>3</td>
<td>Focuses on the means by which government activities can be financed. Topics are tax vs. debt financing; use of appropriate instruments and policies, e.g., types of bonds; and forces that influence implementation, e.g., the design of instruments, fiscal capacity, rating system and market behavior. May be cross-listed with POSC817.</td>
</tr>
<tr>
<td>UAPP 818</td>
<td>Environmental Policy and Administration</td>
<td>3</td>
<td>See POSC818 for course description.</td>
</tr>
<tr>
<td>UAPP 819</td>
<td>Management Decision Making in Public and Nonprofit Sectors</td>
<td>3</td>
<td>Focuses on analytical decision making within public and nonprofit organizations. Examines processes by which decisions can be made and evaluated. Emphasis on conceptual factors that provide a guide to decisions and evaluations of decision methodologies, e.g., systems analysis, cost-benefit analysis, PERT/critical path method, decision trees, performance measurement and time series. May be cross-listed with POSC819. PREREQ: Excel.</td>
</tr>
<tr>
<td>UAPP 820</td>
<td>International Perspectives on Energy and Environment</td>
<td>3</td>
<td>See POSC820 for course description.</td>
</tr>
<tr>
<td>UAPP 821</td>
<td>Proseminar: Technology, Environment and Society</td>
<td>3</td>
<td>Over the last two centuries, forces of industrialization and urbanization have transformed economic, social and political life and the natural environment. Examines theories that explain and assess these transformations, with the goal of fostering critical analysis of social and environmental transformation in international, national and local contexts. May be cross-listed with POSC821.</td>
</tr>
<tr>
<td>UAPP 822</td>
<td>Proseminar in Governance, Planning and Management</td>
<td>3</td>
<td>Deals with policy and research issues concerning the making, administering and outcomes of public policies affecting urban populations and with how urban governance, planning and management processes are influenced by the interaction of the public, private and third sectors at the local, national and international scales.</td>
</tr>
<tr>
<td>UAPP 823</td>
<td>Proseminar: Social and Urban Policy</td>
<td>3</td>
<td>Social policy attempts to promote the well-being of individuals, families and communities through public action. Explores efforts to address social and economic problems in urban society. Considers differential policy impacts by social class, race/ethnicity, gender and age. Topics: welfare, housing, social security, health, education, criminal justice and employment. May be cross-listed with EDUC825 and/or IFS823.</td>
</tr>
<tr>
<td>UAPP 825</td>
<td>Comparative Public Administration</td>
<td>3</td>
<td>See POSC825 for course description.</td>
</tr>
<tr>
<td>UAPP 826</td>
<td>Multivariate Statistical Analysis</td>
<td>3</td>
<td>Provides an in-depth understanding of advanced statistical methods with an applied focus on estimation, inferences, and prediction of models. Major topics are: multiple regression, analysis of variance, collinearity, serial correlation, heterocedascity, and simultaneity, different estimators, comparison of models, dummy dependent variables, dynamic models and lags, and multi-equation models. PREREQ: UAPP815. RESTRICTIONS: A statistics course that introduces regression analysis.</td>
</tr>
<tr>
<td>UAPP 827</td>
<td>Program and Project Analysis</td>
<td>3</td>
<td>Explores the ways in which decision-makers in the public sector evaluate the feasibility of government programs and projects through the application of Cost-Benefit Analysis (CBA), Cost Utility Analysis (CUA), and Cost Effectiveness Analysis (CEA). Focuses on the determination of social costs and social benefits of public policies. PREREQ: UAPP834 or comparable course in public economics and permission of instructor.</td>
</tr>
<tr>
<td>UAPP 828</td>
<td>Urban Society and Urban Policy</td>
<td>3</td>
<td>Traces the evolution of the major social, economic and physical dimensions of U.S. cities in order to understand the nature of current challenges facing American society. Compares the &quot;American&quot; model of urban society with societal forms found in other parts of the world. Examines the role of public policy as a major determinant of the nature of urban communities.</td>
</tr>
<tr>
<td>UAPP 829</td>
<td>Taxation and Fiscal Policies</td>
<td>3</td>
<td>Advanced course in theory and application of financing, spending and regulatory policy instruments of state and local governments. Topics include efficiency, equity and impacts of different types of taxation, user charges, expenditure approaches/ transfers/subsidies and regulation alternatives. May be cross-listed with POSC829.</td>
</tr>
<tr>
<td>UAPP 833</td>
<td>Financial Management in Public and Nonprofit Sectors</td>
<td>3</td>
<td>Principles of public finance and public sector economics are used to examine issues of demand for and delivery of public goods by state and local governments and nonprofit organizations. Topics include revenues, expenditures, intergovernmental and cross-sectoral relationships, budgeting, debt management and asset allocation. May be cross-listed with POSC839. PREREQ: UAPP834.</td>
</tr>
<tr>
<td>UAPP 834</td>
<td>Economics in Public and Nonprofit Sectors</td>
<td>3</td>
<td>Develops microeconomic concepts and applies them to public issues, policies, and programs. Applications deal with a wide range of topics, including health care, education, transportation, housing, community development, energy, and the environment. Emphasizes how microeconomic analysis can enhance decision making.</td>
</tr>
<tr>
<td>UAPP 835</td>
<td>Organization and Management in Public and Nonprofit Sectors</td>
<td>3</td>
<td>Explores (1) theories and concepts of organizational phenomena, (2) current challenges and implications for the public and nonprofit sectors, and (3) issues for individuals who work in these organizations. Behavioral competencies are developed. May be cross-listed with POSC835.</td>
</tr>
<tr>
<td>UAPP 836</td>
<td>Real World Ethics</td>
<td>1</td>
<td>Examines real world situations requiring ethical considerations. Variety of topics to be covered including public policy issues, managerial responsibility and demonstrating ethical integrity in leadership.</td>
</tr>
</tbody>
</table>
UAPP 837  HUMAN RESOURCES MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
Examines the human resources function from three perspectives: 1) basic technical competencies (recruitment, selection, compensation, benefits), 2) legal and constitutional issues in HR, and 3) leadership and organizational change. May be crosslisted with POSC837.

UAPP 838  PUBLIC POLICY ANALYSIS  3
See POSC838 for course description

UAPP 839  ADMINISTRATIVE LAW SURVEY  1
Introduces basic concepts and rules of administrative law and an understanding of the legal issues affecting public and nonprofit organizations in dealing with governmental agencies. Special attention placed on the impact politics has on efforts by administrators to comply with administrative law rules and regulations. No prior legal training or command of legal language necessary.

UAPP 840  HISTORY AND DEVELOPMENT OF THE NONPROFIT SECTOR  3
Traces history and development of the nonprofit sector in the United States with a focus on social, economic, political and legal factors. Volunteering and philanthropy are emphasized. The role of nonprofit organizations in furthering the goals of community development is explored.

UAPP 841  MANAGEMENT AND GOVERNANCE OF NONPROFIT ORGANIZATIONS  3
Provides an introduction to the leadership and management issues facing nonprofit executives and governing boards. Topics include board relationships and voluntary leadership, financial management and budgeting, human resource management, organizational marketing and strategic planning, records management and the use of information technology in management and governance.

UAPP 843  GLOBAL GOVERNANCE: THEORY AND CASES  3
See POSC843 for course description.

UAPP 860  INTERNSHIP SEMINAR  1
Prepares students for the Internship Fieldwork requirement of the Master of Public Administration program. Focuses on informational interview skills, resume preparation and personal statement development. Introduces job search strategies and provides an orientation to the Career Services Center. Helps students make decisions about specialization, internship and career objectives.

UAPP 861  ACADEMIC AND PROFESSIONAL DEVELOPMENT FOR UAPP DOCTORAL STUDENTS  1
Explores a range of topics related to academic processes and professional development for doctoral students. Topics may include: strategies for successful graduate study, advisor/committee strategies, topic selection, the research experience, writing skills, time/stress management strategies, conference presentations, publishing, job searches, professional organizations and networking. Guest speakers include various faculty members, students and alumni.

UAPP 862  TEACHING PRACTICUM IN URBAN AFFAIRS AND PUBLIC POLICY  3
In consultation with a SUAPP faculty member and based on the student's long-term goals and professional background, the student participates in the development (or revision) and teaching of a course. Exposes Ph.D. students who anticipate teaching careers to the pedagogical issues, and planning and implementation of course instruction.

UAPP 863  DOCTORAL DISSERTATION PROPOSAL  3
Requirement of the doctoral program. A "defensible dissertation proposal" must be achieved for successful course completion.

UAPP 864  INTERNSHIP FIELDWORK  2
Three-month (or equivalent) compensated fieldwork, followed by the submission of a reflective paper. Requires prior approval of the SUAPP Internship Coordinator, completion of a work plan, and a professional performance evaluation by the site supervisor.

UAPP 866  SPECIAL PROBLEM  1-12

UAPP 868  RESEARCH  1-6

UAPP 869  MASTER'S THESIS  1-6

UAPP 870  READINGS  1-6

UAPP 872  ANALYTICAL PAPER  3
Demonstrates the student's ability to analyze a particular policy or administrative problem and develop an appropriate response.

UAPP 964  PRE-CANDIDACY STUDY  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.

UAPP 969  DOCTORAL DISSERTATION  1-12 PF

UNIV 101  FIRST YEAR EXPERIENCE I  1 PF
Provides an integrated, content-based, co-curricular experience for LIFE cluster students. Fosters academic and social competencies necessary for university success and provides structured, regular time for LIFE cluster students to meet with peer mentors and faculty.

UNIV 102  FIRST YEAR EXPERIENCE II  1 PF
Continuation of UNIV101. PREREQ: UNIV101.

UNIV 103  FIRST YEAR EXPERIENCE III  1 PF
Continuation of UNIV102. PREREQ: UNIV102.

UNIV 112  SKILMOD: ACADEMIC SELF MANAGEMENT  1 PF
Focuses on self-organization and growth in a college environment. Students investigate the nature of a university, learn how to maximize their productivity through time-management and careful decision-making and examine what a liberal arts education can mean to them.

UNIV 113  SKILMOD: STUDY SKILLS  1 PF
Teaches strategies for understanding and remembering college lectures and test materials. Strategies include identifying the underlying discourse structure of the field, summarizing, comprehension monitoring and transforming notes into test formats. Students practice on their own course materials.

UNIV 114  SKILMOD: CRITICAL THINKING  1 PF
Teaches strategies of good reasoning in humanities, social sciences and other liberal arts areas. Students learn how to become independent, well-informed thinkers and how to make persuasive arguments, using their own course materials.

UNIV 115  SKILMOD: PROBLEM SOLVING  1 PF
Teaches problem-solving strategies for college courses in chemistry, physics, economics, engineering, etc. Students learn methods for breaking problems into manageable components and for using example problems strategically. Students apply these techniques to courses they are currently taking.

UNIV 260  EXPERIENTIAL TEACHING  0-3
Teaching experience as group tutor, peer facilitator/instructor, workshop guide, or undergraduate teaching assistant. Leadership skills developed and applied in laboratory, problem-based learning (PBL), or peer-led team learning mode of instruction in an undergraduate course. Evaluation based on preparation and engagement in teaching and leadership process.

UNIV 262  EXPERIENTIAL LEARNING  0-6
Learning experience on or off campus. Other types of learning out of class and beyond existing department courses. Such experiences as non-major required discovery learning, service learning, fieldwork, coop, apprenticeship, and internship.

UNIV 268  UNDERGRADUATE RESEARCH  1-6
Undergraduate research conducted on or off campus, out of class, and under the supervision of a faculty member.

UNIV 301  PEER MENTOR PRACTICUM I  1 PF
Seminar for peer mentors working in the LIFE program. Covers issues in peer mentor activities and LIFE clusters.
**UNIVERSITY COURSES**

**UNIV 302** Peer Mentor Practicum II 1 PF
- Continuation of UNIV 301
- PREREQ: UNIV 301.

**UNIV 303** Peer Mentor Practicum III 1 PF
- Continuation of UNIV 302
- PREREQ: UNIV 302.

**UNIV 320** Contemporary Issues for Resident Assistants 1
- Introduces new resident assistants to issues affecting college students. All topics covered focus on the needs of the new resident assistant in the Office of Residence Life.
- RESTRICTIONS: Must be a resident assistant.

**UNIV 360** Experiential Teaching 0–3
- Teaching experience as group tutor, peer facilitator/instructor, workshop guide, or undergraduate teaching assistant. Leadership skills developed and applied in laboratory, problem-based learning (PBL), or peer-led team learning mode of instruction in an undergraduate course. Evaluation based on preparation and engagement in teaching and leadership process.
- RESTRICTIONS: Requires permission of instructor. May not substitute major courses required in department curriculum.

**UNIV 362** Experiential Learning 0–6
- Learning experience on or off campus. Other types of learning out of class and beyond existing department courses. Such experiences as non-major required discovery learning, service learning, fieldwork, co-op, apprenticeship, and internship. Leadership skills developed and applied.
- RESTRICTIONS: Requires permission of instructor. May not substitute major courses required in department curriculum.

**UNIV 364** Experiential Internship 3
- Internship experience of fifty hours combined with a seminar emphasizing career development, reflection, and personal learning skills. Internship must be arranged and Learning Contract signed prior to first class meeting. Open to major and non-major related internships, paid or volunteer.
- RESTRICTIONS: May not substitute major courses required in department curriculum.

**UNIV 368** Undergraduate Research 1–6
- Undergraduate research conducted on or off campus, out of class, and under the supervision of a faculty member.
- RESTRICTIONS: Requires permission of instructor. May not fulfill course requirements in a major curriculum except by departmental permission.

**UNIV 369** Honors: Undergraduate Research Sustaining 0 PF
- Research apprenticeship with faculty mentor.
- RESTRICTIONS: Limited to those appointed as Undergraduate Research Scholars in the Undergraduate Research Program. Must have approval of the Coordinator of Undergraduate Research.

**UNIV 401** Senior Thesis 2–4
- Senior thesis for students working toward a degree with distinction.
- RESTRICTIONS: Total credits for UNIV 401 and UNIV 402 not to exceed six.

**UNIV 402** Senior Thesis 2–4
- Continuation of UNIV 401.
- RESTRICTIONS: Total credits for UNIV 401 and UNIV 402 not to exceed six.

**UNIV 460** Experiential Teaching 0–3
- Teaching experience as group tutor, peer facilitator/instructor, workshop guide, or undergraduate teaching assistant. Leadership skills developed and applied in laboratory, problem-based learning (PBL), or peer-led team learning mode of instruction in an undergraduate course. Evaluation based on preparation and engagement in teaching and leadership process.
- RESTRICTIONS: Requires permission of instructor. May not substitute major courses required in department curriculum.

**UNIV 462** Experiential Learning 0–6
- Learning experience on or off campus. Other types of learning out of class and beyond existing department courses. Such experiences as non-major required discovery learning, service learning, fieldwork, co-op, apprenticeship, and internship. Leadership skills developed and applied.
- RESTRICTIONS: Requires permission of instructor. May not substitute major courses required in department curriculum.

**UNIV 468** Undergraduate Research 1–6
- Undergraduate research conducted on or off campus, out of class, and under the supervision of a faculty member.
- RESTRICTIONS: Requires permission of instructor. May not fulfill course requirements in a major curriculum except by departmental permission.

**UNIV 490** Honors Tutorial: Humanities 3
- Designated faculty direct the studies of up to four students per semester. Readings of classical works in the humanities described. Group as well as individual discussions.
- RESTRICTIONS: Requires 3.4 GPA, junior standing or above, and permission of the Honors Program.

**UNIV 491** Honors Tutorial: Natural/Social Science 3
- Designated faculty direct the studies of up to four students per semester. Reading of classical works in the social and natural sciences described. Group as well as independent discussions.
- RESTRICTIONS: Requires 3.4 GPA, junior standing or above and permission of the Honors Program.

**UNIV 495** Honors Seminar 3
- Topics vary; usually interdisciplinary.
- RESTRICTIONS: Requires 3.4 GPA, junior status or above, and permission of the Honors Program. May be repeated for credit with a different topic and instructor.

**UNIV 500** Leave of Absence 0 NF
- Explores cognitive, affective and social aspects of the learning process through research and reflection on learning and teaching literature in higher education. Students develop skills to facilitate learning in their respective disciplines. Modern information technologies and library resources access essential.
- RESTRICTIONS: May be repeated with different Learning Module.

**UNIV 601** Pedagogy 0 PF
- Explores cognitive, affective and social aspects of the learning process through research and reflection on learning and teaching literature in higher education. Students develop skills to facilitate learning in their respective disciplines. Modern information technologies and library resources access essential.
- RESTRICTIONS: May be repeated with different Pedagogy Module.

**UNIV 602** Faculty Roles 0 PF
- Explores cognitive, affective and social aspects of the learning process through research and reflection on learning and teaching literature in higher education. Students develop skills to facilitate learning in their respective disciplines. Modern information technologies and library resources access essential.

**WOMS 201** Introduction to Women’s Studies 3
- Study of the causes and conditions determining women’s status in society, as evidenced in institutional structures and personal relations between men and women. Taught from multidisciplinary perspectives.

**WOMS 202** Introduction to International Women’s Studies 3
- Examines how public policies and traditional customs affect women’s lives around the world. Focuses on the effects of political and economic status, social norms and institutional structures on women’s conditions in family life, education and employment.

**WOMS 203** Contemporary Moral Problems 3
- See Phil 202 course description.

**WOMS 205** Women in the Arts and Humanities 3
- Interdisciplinary survey of women’s contributions to the arts and humanities, also including literary/artistic images of women, contributions of minority non-Western women, and study of the relationship between women’s socioeconomic roles and cultural expressions.

**WOMS 206** Women and Work 3
- Covers a variety of topics including women in traditional and non-traditional occupations, gender-based discrimination (wage inequities, sexual harassment, exclusionary policies), the contributions of women to the economy and the role of law in shaping conditions for women in the workplace. May be cross-listed with SOC 206.
WOMS 207 Women, Power and Success 3
Research, theory and possible strategies related to expanding the horizons in achieving "power" and "success" in women's lives. Topics include socializing girls to be successful, evaluating personal strengths and goals, and a new model of women and power.

WOMS 210 Women and Religion 3
Examines the impact of Near Eastern and Judeo-Christian scriptures on women in the family and society, especially focusing on women's roles as mystics and leaders within and outside of institutional religion. Also covers recent feminist approaches to religion. May be cross-listed with PHIL 210.

WOMS 211 Men, Conflict and Social Change 3
Examination of male roles and images in society, utilizing an interdisciplinary social science perspective. Topics include the family, war, military, violence and the implications of feminism for men. Issue oriented. May be cross-listed with SOC 211.

WOMS 212 Motherhood in Culture and Politics 3
Examines contemporary cultural and political issues related to motherhood and mothering experience, including definitions and cultural significance of motherhood, experiences of childbirth, effects of new reproductive technologies, surrogate mothering and "maternal thinking." Also, efforts to avoid motherhood through contraception and abortion and related legal controversies.

WOMS 213 Men and Women in American Society 3
See SOC 213 for course description.

WOMS 215 Queer Sexual Imagery in the Visual Arts 3
See MSST 215 for course description.

WOMS 216 Introduction to Feminist Theory 3
See PHIL 216 for course description.

WOMS 222 Language and Gender 3
SeeLING 222 for course description.

WOMS 233 Women, Biology and Medicine 3
Considers societal theories and medical practices concerning women and discusses their biological basis, their biological effects, sources of information with which to evaluate them, etc. Emphasis on preparing the student to make own medical and obstetrical decisions and to critically evaluate claims concerning male/female differences. May be cross-listed with CSCC 233.

WOMS 240 Women and Violence 3
Analyzes a variety of issues and topics relating to women and violence, including rape, domestic violence, images of women in popular culture, incest and child abuse, pornography, sexual harassment and women who use violence. Presents descriptive materials, sociological analysis and strategies for change.

WOMS 242 Woman as Image and Imagemaker 3
See ARTH 242 for course description.

WOMS 250 Topics in International Women's Studies 3
Explores topics related to women's lives in various parts of the world and may include women's history, women's creativity, and social movements in Africa, Asia, Europe, Australia or Latin America. RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 260 Women: Cultural Representations 3
Examines issues of representation across time and cultures. Offers critical analysis of how women have been presented and represented themselves, as well as how their cultural productions and creative labors in a variety of media have been represented by others.

WOMS 290 Women and Gender in International Films 1 PF
Through viewing feature films about women and/or gender in cultures outside that of mainstream United States, explores how sex and gender shape lives and experiences. Enriches understanding of the diversity of gendered cultural norms and ways filmmakers choose to illustrate them.

WOMS 291 Women's History Through Film 1
Explores women's historical experiences through the medium of film. Students will view and discuss a variety of feature and documentary films on women and read materials related to topics covered in the films. Films will deal with historical and contemporary issues in the United States and internationally. May be cross-listed with HIST 291.

WOMS 298 Research on Race, Ethnicity and Culture 1 PF
Lecture series in which faculty and guest speakers discuss their research on contemporary and historical perspectives on race, ethnicity and culture. Research presented from several disciplines, including sociology, history, literature, anthropology and psychology, among others. May be cross-listed with AMS 298.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 299 Research on Women 1 PF
Interdisciplinary lectures in which faculty, staff and advanced students share results of their research on women. Lectures cover issues in anthropology, sociology, political theory, psychology, philosophy, literature, history, theology, ethnic studies, music, art, math education, health, etc. RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 300 Women in American History 3
See HIST 300 for course description.

WOMS 302 Women in Music: An Alternate Survey 3
See MUSC 302 for course description.

WOMS 305 The Evolution of Human Sex Roles and Reproduction 3
See ANTH 305 for course description.

WOMS 311 Renaissance Women, Society and Art 3
See ARTH 311 for course description.

WOMS 315 Third World Women in Politics 3
See POSC 315 for course description.

WOMS 318 Studies in Film 3
See ENGL 318 for course description. PREREQ: ENGL 110. RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 320 Varying Authors and Genres 3
See FLIT 320 for course description.

WOMS 321 Topics: Chinese Literature in Translation 3
See FLIT 321 for course description. RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 322 Topics: Classical Literature in Translation 3
See FLIT 322 for course description.

WOMS 323 Introduction to Women and Politics 3
See POSC 323 for course description.

WOMS 326 Topics: Hispanic Literature in Translation 3
See FLIT 326 for course description.

WOMS 327 Race, Gender, Science 3
See PHIL 327 for course description.

WOMS 328 Topics: Japanese Literature in Translation 3
See FLIT 328 for course description.

WOMS 329 Topics: Italian Literature in Translation 3
See FLIT 329 for course description.

WOMS 330 Varying Authors, Themes and Movements 3
See FLIT 330 for course description.

WOMS 333 Psychology of Women 3
See PSYC 333 for course description.

WOMS 334 African American Women's History 3
See HIST 334 for course description.

WOMS 350 Gender and Criminal Justice 3
See CRJU 350 for course description.

WOMS 352 Studies in Nineteenth-Century Literature 3
See ENGL 352 for course description. PREREQ: ENGL 110. RESTRICTIONS: May be repeated once for credit when topics vary.

WOMS 353 Twentieth Century British Literature 3
See ENGL 353 for course description.

WOMS 363 Women in Cross-Cultural Perspective 3
Social realities of women within the cultures of Asia, Africa and Latin American societies. How institutions such as motherhood, the family, sexuality and work structure women's lives within the dominant social ideologies. May be cross-listed with ANTH 363.
WOMS 366 Independent Study 1-6
See HIST372 for course description.

WOMS 372 Popular Culture in Urban Japan 3
See HIST372 for course description.

WOMS 375 Topics: Russian and Soviet Culture in Translation 3
See FLIT375 for course description.

WOMS 380 Women Writers 3
See ENGL380 for course description.

WOMS 381 Women in Literature 3
See ENGL381 for course description.

WOMS 382 Studies in Multicultural Literature in English 3
See ENGL382 for course description.

WOMS 383 Topics: Chinese Culture in Translation 3
See FLIT383 for course description.
RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 385 Women and the Economy 3
See ECON385 for course description.
PREQ: ECON111.

WOMS 389 Topics: Women and Health Issues 3
Varying topics related to women's health. Topics may include, but are not limited to: the relationship between women, health and development; theoretical contributions of feminism to thinking about relationship between gender and health; women's health conditions in various parts of the world. May be cross-listed with CSCS389 and/or PHIL389.
RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 390 Honors Colloquium 3
See IFST390 for description.
May be cross-listed with IFST390.

WOMS 392 Honors Colloquium 3
See PHIL392 for course description.

WOMS 401 Foundations of Human Sexuality 3
See IFST401 for course description.

WOMS 402 Topics in Constitutional Law 3
See POSC402 for course description.
RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 407 Sociology of Sex and Gender 3
See SOC407 for course description and restrictions.

WOMS 409 Domestic Violence Services 3
See IFST409 for course description.
PREQ: IFST235 or SOC4201 or WOMS201.
RESTRICTIONS: Open to juniors and seniors only.

WOMS 410 Critical Issues in Feminist Scholarship 1
Capstone course for majors. Culminates in a senior conference. One of the following options must be completed: 400-level seminar course cross-listed with WOMS, a women's studies internship (WOMS498), a study abroad program with a WOMS component in the senior year, or a WOMS thesis (WOMS411) or equivalent such as an art portfolio or performance piece.
RESTRICTIONS: Senior majors and minors. Requires approval of women's studies advisor and course instructor. Students who select the cross-listed seminar option, study abroad option, thesis option or equivalent, or internship option must register for the appropriate courses.

WOMS 411 Seminar in American History 3
See HIST411 for course description.
RESTRICTIONS:

WOMS 413 Problems in American Government 3
See POSC413 for course description.

WOMS 415 Race, Class and Gender 3
See SOC415 for course description.

WOMS 418 Race, Gender and Poverty 3
See SOC418 for course description.
PREQ: SOC401.

WOMS 420 Women's Studies Senior Thesis 3-6
Senior thesis for women's studies majors or minors.
COREQ: Students enrolled in WOMS420 must also take WOMS410 the same semester or the following semester.
RESTRICTIONS: Women's studies majors or minors and permission of the WOMS program.

WOMS 430 Family Life Education 3
See IFST430 for course description.

WOMS 436 Politics and Literature 3
See POSC436 for course description.

WOMS 439 Women and Revolution in Africa 3
See HIST439 for course description.

WOMS 440 Topics in Interpersonal and Organizational Communication 3
See COMM440 for course description.

WOMS 442 Topics in Organizational Communication 3
See COMM442 for course description.

WOMS 444 Seminar: Women in the Islamic Middle East 3
See HIST444 for course description.

WOMS 460 Women in International Development 3
See SOCI460 for course description.

WOMS 465 Studies in Literature Genres, Types and Movements 3
See ENGL465 for course description.

WOMS 466 Independent Study 1-6

WOMS 472 Seminar in Medieval History 3
See HIST471 for course description.

WOMS 475 Seminar in Modern European History 3
See HIST475 for course description.

WOMS 480 Seminar 3
See ENGL480 for course description.

WOMS 484 Women in Sports 3
See HESC484 for course description.

WOMS 498 Internship in Women's Studies 3
Students work 115 hours per semester in an agency or program associated with women's issues. Academic knowledge applied to actual working situations. Seminar discussions focus on internship experience in light of academic research and theory.
RESTRICTIONS: Requires permission of instructor.

WOMS 610 Critical Issues in Feminist Scholarship 3
Provides a survey introduction to women's studies for graduate students.