<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Restrictions</th>
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<tbody>
<tr>
<td>MALS 625</td>
<td>FILM AND AMERICAN SOCIETY</td>
<td>3</td>
<td>Requires approval of instructor</td>
</tr>
<tr>
<td>MALS 626</td>
<td>STUDIES IN 20TH CENTURY AMERICAN LITERATURE</td>
<td>3</td>
<td>Requires approval of instructor</td>
</tr>
<tr>
<td>MALS 647</td>
<td>PHILOSOPHY OF TECHNOLOGY</td>
<td>3</td>
<td>For MALS students only</td>
</tr>
<tr>
<td>MALS 648</td>
<td>ENVIRONMENTAL ETHICS</td>
<td>3</td>
<td>For MALS students only</td>
</tr>
<tr>
<td>MALS 660</td>
<td>ON BECOMING HUMAN</td>
<td>3</td>
<td>Open to majors only</td>
</tr>
<tr>
<td>MALS 689</td>
<td>MASTER'S THESIS</td>
<td>1-6</td>
<td></td>
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<tr>
<td>MALS 879</td>
<td>SYNTHESIS PROJECT</td>
<td>1-6</td>
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### MARINE STUDIES

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>MAST 200</td>
<td>THE OCEANS</td>
<td>3</td>
<td>Integrates physical, chemical, geological and biological principles into an overview that addresses why and how the oceans work. Draws heavily on current ocean issues to illustrate processes and problems. Requires open to non-science majors or with permission from instructor.</td>
</tr>
<tr>
<td>MAST 314</td>
<td>COMPARATIVE TERRESTRIAL AND MARINE ECOLOGY</td>
<td>3</td>
<td>See ENW314 for course description.</td>
</tr>
<tr>
<td>MAST 366</td>
<td>INDEPENDENT STUDY</td>
<td>1-6</td>
<td></td>
</tr>
<tr>
<td>MAST 464</td>
<td>MARINE SCIENCE SUMMER INTERNSHIP</td>
<td>1-3</td>
<td>Students design a research project with an advisor and present it to peers, advisors and course instructor.</td>
</tr>
<tr>
<td>MAST 466</td>
<td>INDEPENDENT STUDY</td>
<td>1-3</td>
<td></td>
</tr>
<tr>
<td>MAST 482</td>
<td>INTRODUCTION TO OCEAN SCIENCES</td>
<td>3</td>
<td>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 MATH222; CHEM103 or CHEM111; PHYS201 or PHYS207.</td>
</tr>
<tr>
<td>MAST 601</td>
<td>INTRODUCTION TO OCEANOGRAPHY</td>
<td>3</td>
<td>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. REQUIREMENTS: Open to non-oceanographers Requires graduate status.</td>
</tr>
<tr>
<td>MAST 602</td>
<td>PHYSICAL OCEANOGRAPHY</td>
<td>3</td>
<td>Geographical 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, vertical dynamics, viscous flow and eddy flow. REQUIREMENTS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MAST 603</td>
<td>INTRODUCTION TO MARINE AND AQUATIC EDUCATION</td>
<td>3</td>
<td>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 exploratory in development of thematic curricula. For inservice educators. REQUIREMENTS: Inservice educators only.</td>
</tr>
<tr>
<td>MAST 604</td>
<td>ENVIRONMENTAL DATA MANAGEMENT</td>
<td>1</td>
<td>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. REQUIREMENTS: Requires approval of instructor.</td>
</tr>
<tr>
<td>MAST 605</td>
<td>TOPICS: MARINE SCIENCE EDUCATION</td>
<td>1-4</td>
<td>Stimulates Delaware teachers into incorporating integrated marine sciences into their classroom teaching.</td>
</tr>
<tr>
<td>MAST 606</td>
<td>OCEAN AND ATMOSPHERE REMOTE SENSING</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MAST 607</td>
<td>WRITING PAPERS IN THE MARINE SCIENCES</td>
<td>3</td>
<td>The process and mechanics of publishing scientific papers in marine journals. Covers organizing data in tables and figures; mechanics of drawing up effective figures; marshalling of tables, figures and scientific ideas into a coherent story; and strategies and techniques used in effective writing.</td>
</tr>
<tr>
<td>MAST 615</td>
<td>INTRODUCTION TO MARINE BIOLOGY</td>
<td>3</td>
<td>Involves laboratory, field and lecture study for a broad understanding of marine biology and biochemistry. REQUIREMENTS: For non-biologically oriented marine studies graduate students.</td>
</tr>
<tr>
<td>MAST 616</td>
<td>METHODS IN MOLECULAR BIOLOGY</td>
<td>3</td>
<td>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: MAST613.</td>
</tr>
<tr>
<td>MAST 617</td>
<td>METHODS IN MOLECULAR BIOLOGY LABORATORY</td>
<td>3</td>
<td>Provides practical experience in molecular biological techniques with emphasis on applications to marine related problems. COREQ: MAST616.</td>
</tr>
<tr>
<td>MAST 618</td>
<td>MARINE MICROBIAL ECOLOGY</td>
<td>3</td>
<td>Examines role of microbes in the oceans and their impact on ecosystem 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. REQUIREMENTS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MAST 620</td>
<td>ENERGY POLICY AND ADMINISTRATION</td>
<td>3</td>
<td>See POSC624 for course description.</td>
</tr>
<tr>
<td>MAST 621</td>
<td>COASTAL FIELD BIOLOGY</td>
<td>2</td>
<td>Hands-on study of estuarine and coastal communities with emphasis on patchiness in time and space. Instruction in field techniques as well as analysis and presentation of data. Experience in scientific writing. PREREQ: General biology, ecology, genetics, physiology.</td>
</tr>
<tr>
<td>MAST 622</td>
<td>CONSERVATION AND RENEWABLE ENERGY POLICY</td>
<td>3</td>
<td>See UAPP626 for course description.</td>
</tr>
<tr>
<td>MAST 623</td>
<td>PHYSIOLOGY OF MARINE ORGANISMS</td>
<td>3</td>
<td>Processes and mechanisms of adaptation of organisms to marine environments. Examines how environmental factors affect physiological processes in marine organisms. Lectures address physiological processes at cellular, whole organism and habitat levels. PREREQ: MAST634 or equivalent. Requires permission of instructor.</td>
</tr>
<tr>
<td>MAST 624</td>
<td>BIOLOGICAL OCEANOGRAPHY</td>
<td>3</td>
<td>Broad, multidisciplinary approach to marine life and biological processes in the oceans and estuaries. Species composition and biogeography discussed in relation to physical, chemical and geological processes. Examines and quantifies organisms' physiological responses to the abiotic and biotic environment.</td>
</tr>
<tr>
<td>MAST 626</td>
<td>TOPICS IN HALOPHYTE BIOLOGY</td>
<td>1</td>
<td>Analysis of current research in the biology of halophytic plants. Emphasis on student seminars and group discussions of the current literature. REQUIREMENTS: May be repeated for credit when topics vary.</td>
</tr>
<tr>
<td>MAST 627</td>
<td>MARINE BIOLOGY</td>
<td>3</td>
<td>Ecologically oriented study of elementary oceanography, adaptive physiology, aspects of population and community ecology, reproductive and larval biology and marine production systems. Emphasis on coastal and estuarine habitats including soft- and hard-substrate intertidal regions, subtidal regions and coral reefs. PREREQ: General biology, ecology, genetics, and physiology. REQUIREMENTS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MAST 628</td>
<td>COMPARATIVE ENVIRONMENTAL POLITICS</td>
<td>3</td>
<td>Selected topics in marine ecology and physiology. Topics may vary and will be announced in the registration booklet. REQUIREMENTS: Requires permission of instructor. May be repeated for credit when topics vary.</td>
</tr>
<tr>
<td>MAST 629</td>
<td>TOPICS IN MARINE ECOLOGY</td>
<td>1-3</td>
<td>See UAPP627 for course description.</td>
</tr>
</tbody>
</table>
MAST 631  MARINE GEOLOGY  3
See GEOLE631 for course description.

MAST 633  IMAGE PROCESSING  3
See ELEG633 for course description.

MAST 634  MARINE BIOCHEMISTRY  3
Addresses biochemical processes and enzyme, metabolic and structural adaptations of marine
plants and animals. Discussions on topics such as enzyme kinetics, enzyme structure and
metabolic pathways to organisms in the marine environment.
Restrictions: Requires sufficient background in chemistry and permission of instructor.

MAST 635  TURBULENCE IN THE ENVIRONMENT  3
Fundamentals of turbulence including the dynamics of vorticity, the cascade of energy and the
theory of Kolmogorov, turbulent diffusion and turbulence in density stratified flows.
Applications to many engineering disciplines as well as to meteorology and oceanography.

MAST 637  GEOLOGICAL OCEANOGRAPHY  3
Focuses on processes that create the oceanic and continental margin sedimentary record. Topics
include marine particle production and composition, transport, seafloor morphometry,
stratigraphy and paleoceanography. Students will gain a broad understanding of concepts in
geological oceanography and marine geology.

MAST 640  OPIO-ELECTRONICS  3
See ELEG640 for course description.

MAST 645  GENERAL OCEANOGRAPHY  3
Introduction to the science of oceanography for teachers, emphasizing the physical and natural
sciences, nature of the subject matter and application to social schemes. Where applicable mid-
Atlantic environments are emphasized to demonstrate physical, chemical, geological and
biological themes associated with oceanographic sciences.
Restrictions: Offered off-campus, for public school teachers and general public.

MAST 646  CHEMICAL OCEANOGRAPHY  3
Composition of seawater; physicochemical properties of seawater distributions of gases,
nutrients and trace metals; and effect of biological processes on seawater composition.
Prereq: CHEM103 and CHEM104.

MAST 647  PHYSICAL CHEMISTRY OF SEAWATER  3
Introduction to chemical equilibria in seawaters: Topics include electrolyte theory, gas
solubility, chemical speciation, acid-base equilibria and the carbon dioxide system. Emphasizes
use of computer techniques to study oceanic chemical processes.
Prereq: One year of chemistry.
Restrictions: Computer experience not required.

MAST 670  UNITED STATES OCEAN AND COASTAL POLICY  3
Provides an overview and assessment of the evolution of U.S. ocean and coastal policies,
including such policy areas as coastal management, fisheries management, marine mammal
protection, offshore oil development, and marine pollution control.

MAST 671  COASTAL PROCESSES AND MANAGEMENT  3
Introduction to key processes operating in the coastal zone and to management techniques
appropriate to these processes and environments. Emphasis on policy, regulatory and
intergovernmental complexities that characterize coastal zone management (in the United States
and in other coastal nations).

MAST 672  APPLIED POLICY ANALYSIS  3
Empirical analysis of environmental and natural resource policy issues. Topics include
valuation of natural resources, decision making under uncertainty, dynamic control and
intertemporal issues in resource use and institutional aspects of policy analysis.
May be cross-listed with ECON670.
Prereq: ECON401.

MAST 673  INTERNATIONAL LAW  3
Origins, sources and applications of law to international relations, including the nature of
treaties, the legal powers of states and international organizations, jurisdiction and immunities,
and the role of international courts. Special attention given to the law of the sea for navigation,
fisheries conservation, mineral exploitation and environmental protection.
May be cross-listed with POSC604.
Restrictions: Requires permission of instructor.

MAST 674  LEGAL ASPECTS OF THE COASTAL ZONE  3
Examines basic legal doctrines and public policy implications relevant to the development and
protection of the coastal zone of the United States. Use, ownership and control of water and
land beneath and bordering upon water; relationships between the states and the federal
government in areas of marine affairs; environmental protection and legal controls of water
pollution.
Restrictions: Requires permission of instructor.

MAST 675  ECONOMICS OF NATURAL RESOURCES  3
Study of the allocation of natural resources, especially marine and coastal zone resources, in
modern economies. Application of economic theory to the problems of misallocations and the
means of correction, under both free and planned markets.
May be cross-listed with ECON675.
Restrictions: Requires permission of instructor.

MAST 676  ENVIRONMENTAL ECONOMICS  3
Study of the choice of policies to protect the environment, including land, air and water
resources. Theory of market failure and externalities, use of economic incentives in policy
design, valuation of environmental resources and examination of inefficiencies in existing U.S.
environmental policies.
May be cross-listed with ECON676.
Prereq: ECON300.

MAST 677  INTERNATIONAL OCEAN AND ENVIRONMENTAL POLICY  3
Focuses on understanding the strengths and weaknesses of the legal framework which governs
ocean resources, ocean space and the environment beyond the limits of national jurisdiction.
Evaluates international conventions which pertain to the ocean and environment as to impact
and effectiveness.

MAST 678  COASTAL AND MARITIME LAW  3
Introduction to U.S. coastal and maritime law including legal issues of coastal title and
boundaries, beach access, public trust doctrine, and carriage of goods by sea, torts against
seamen, collisions, salvage, and marine pollution.
May be cross-listed with POSC678 and/or UAPP678.
Restrictions: Open to Juniors, Seniors and graduate students.

MAST 679  SHIPPING 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 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 based data. Application to oceanography, coastal processes, geology,
land use, geography, agriculture, climate and pollution studies.
May be cross-listed with ELEG681 and/or GEOG681.
Restrictions: Requires permission of instructor.

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,
eutrium productivity, ocean dynamics and climatic effects presented by University students,
faculty and guest speakers. Stresses advanced data acquisition and spatial and spectral image
analysis techniques.
Restrictions: May be repeated for credit when topics vary.

MAST 691  OCEAN FLUID DYNAMICS  4
See CIEG691 for course description.

MAST 692  ENVIRONMENTAL VALUES, MOVEMENTS 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.
Prereq: MEEG690.

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 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: MEEG663 and MEEG664.
MATH 901 INTERMEDIATE ALGEBRA 3 R

Review skills necessary for Pre-calculus and College Mathematics and Statistics courses. 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 R
Reviews skills necessary for Pre-calculus and College Mathematics and Statistics courses. 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.
PREREQ: MATH101 or MATH102
RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH116, 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 MATH101
RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH116, MATH170 and MATH171 can count toward graduation.

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 (MATH221) are emphasized.
PREREQ: MATH101 or MATH102
RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH116, MATH170 and MATH171 can count toward graduation.

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 MATH114, MATH115, MATH117, MATH170 and MATH172 can count towards graduation

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, 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: MATH101 or MATH102
RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH117, 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 tests 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, simple 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: MATH120 or MATH230.

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

MATH 221 CALCULUS I 3
Topics include functions, graphing functions, limits, derivatives, sequences, series, exponential and logarithmic functions, and integration.
RESTRICTIONS: Two years of high school algebra and one year of geometry. Credit cannot be received for both MATH221 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 241 ANALYTIC GEOMETRY AND CALCULUS A 4
Functions, limits, continuity, derivatives and definite integrals.
RESTRICTIONS: Requires two years of high school algebra, one year of geometry and trigonometry. 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 MATH221.

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: MATH120 and MATH243.

MATH 251 MATHEMATICS FOR THE ELEMENTARY SCHOOL I 3
Basic concept development in sets, numeration systems, functions, system of whole numbers and related algorithms, selected topics from number theory, and integers. Emphasis placed on problem solving and general number sense.
RESTRICTIONS: Requires School of Education Mathematics Competency Test.

MATH 252 MATHEMATICS FOR THE ELEMENTARY SCHOOL II 3
Basic concept development in rational numbers expressed as fractions and decimals, proportional reasoning, percent, properties of real numbers, basic statistical topics and probability.
PREREQ: MATH251.

MATH 253 MATHEMATICS FOR ELEMENTARY SCHOOL III 3
Basic geometric concept development in classifying and analyzing basic two and three dimensional geometric shapes, the role of definitions, symmetry, congruence, similarity, Euclidean constructions, measurement topics including linear and regional, coordinate geometry and graphing in a plane.
PREREQ: MATH252.

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 inchers 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: MATH120 and MATH243.

MATH 302 ORDINARY DIFFERENTIAL EQUATIONS 3
Solutions and applications of ordinary differential equations as well as systems. Consider 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
PREQ: MATH202
RESTRICTIONS: For chemical engineering majors only

MATH 315 DISCRETE MATHEMATICS II 3
Algorithmic graph theory, correctness and complexity of algorithms, recurrence relations, numerical algorithms, algorithms for polynomials (such as Horner’s method)
PREQ: MATH210 and MATH241

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
PREQ: 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 those topics and appropriate physical systems
PREQ: 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
Systems of linear equations, matrix algebra and determinants. Vector spaces, linear dependence and independence, basis and dimension. Linear transformations, matrix representation and similarity transformations. Includes use of the computer for analysis and solution of problems in linear algebra
PREQ: MATH230 or MATH242
RESTRICTIONS: Credit not given for both MATH349 and either MATH341, MATH342 or MATH351

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 MATH349. 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, Laplacian, line integrals, divergence theorem, Stokes’ theorem, Fourier series, orthogonality, diffusion equation, Laplace’s equation, wave equation, separation of variables, with engineering applications
PREQ: MATH351
RESTRICTIONS: Open to MEEG and CIEG students only

MATH 353 ENGINEERING MATHEMATICS III 3
Numerical Methods in engineering, linear and non-linear algebraic equations, numerical solution of ordinary differential equations, Runge-Kutta methods, boundary value problems, finite differences, diffusion, Laplace equation, applications to engineering problems with programming
PREQ: MATH351
RESTRICTIONS: Open to MEEG and CIEG students

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: MATH380
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 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
PREQ: MATH380
COREQ: EDUC400

MATH 389 GRAPH THEORY 3
Basic graph theory (paths and circuits, trees and forests, connectivity and coloring theorems) and network flow theory. Applications to areas such as economics, engineering, chemistry and sociology
PREQ: MATH210

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
PREQ: 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-square problems and nonlinear equations. Stress both numerical analysis and algorithmic aspects
PREQ: MATH249 or MATH349 or MATH351; and either MATH105 or CISC101
RESTRICTIONS: Requires familiarity with computing (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
PREQ: MATH245 or CISC410

MATH 450 STATISTICS FOR ENGINEERING AND PHYSICAL SCIENCES 3
Combinatorial probability: distribution theory, estimation and hypothesis testing. Experimental design, analysis of variance and regression theory
PREQ: MATH243.

MATH 451 ABSTRACT ALGEBRA I 3
Basic properties of the integers and the rationals, fields, quotients, polynomial rings, root-finding, introduction to groups, rings and fields. A historical perspective on the development of the notion of number and algebraic structure will be provided
PREQ: MATH249 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
PREQ: A 300 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
PREQ: MATH243.

MATH 510 MODELING AND ANALYSIS OF ENVIRONMENTAL SYSTEMS 3
An elementary course to introduce basic analytical and numerical methods for studying mathematical problems arising in environmental sciences
PREQ: MATH242 or equivalent
RESTRICTIONS: Open to environmental science graduate students or by consent of instructor

MATH 512 CONTEMPORARY APPLICATIONS OF MATHEMATICS 3
Aimed at providing 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
PREQ: 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 Walrasian equilibria; non-linear programming and the Kuhn-Tucker Theorem; dynamic programming including dynamic programming and Pontryagin's Maximum Principle. Emphasis on applications and interpretation in terms of economic models. May be cross-listed with ECON350.
PREREQ: MATH302, MATH349, ECON301 and ECON303.

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: MATH345.
RESTRICTIONS: Graduate credit only for teachers.

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: MATH381.
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 pre-calculus. Participants get hands-on experience with a function plotting, spreadsheet, geometry package and a statistical/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 non-routine problems. Teachers will become familiar with problem solving strategies that can be used not only for non-routine 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 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 Lebesgue 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 MEEG683 or PHYS207.

MATH 612 Introduction to Numerical Methods for Partial Differential Equations 3
PREREQ: MATH503 or MEEG683 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: MATH680 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 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, WKBJ and multiple-scale expansion techniques. Selected applications
PREREQ: MATH167 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: MATH167 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 property; convergence of nets and filters

MATH 835  PARTIAL DIFFERENTIAL EQUATIONS I  3
Existence and uniqueness for elliptic, parabolic and hyperbolic equations. Boundary and initial value
problems for equations of hyperbolic and parabolic type in two independent variables
Classical approaches employed
PREREQ: MATH167

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. Modern approaches
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: MATH612 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: MATH602 or consent of instructor.

MATH 868  RESEARCH  1-6

MATH 869  MASTER'S THESIS  1-6

MATH 870  READING IN MATHEMATICS  1-6

MATH 884  FINITE GEOMETRIES AND DESIGNS  3
Classical projective and affine spaces, n-dimensional Euclidean planes, coordinate systems, spreads
and packings, cocyclic and unitals, 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 MATH689

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

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 e-mail 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 immunoassays, 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 load testing and DNA sequencing.
PREREQ: BISC208, and CHEM213 or CHEM321.
RESTRICTIONS: Requires permission of instructor

MEDT 391  INTRODUCTION TO MOLECULAR DIAGNOSTICS
LABORATORY  1
Laboratory exercises that correlate with MEDT390. Techniques include isolation of nucleic
acids from biological fluids, electrophoresis, PCR, viral load testing and DNA sequencing.
PREREQ: BISC208, and CHEM213 or CHEM321.
COREQ: MEDT1390
RESTRICTIONS: Requires permission of instructor

MEDT 400  URINALYSIS AND BODY FLUIDS  2
The study of routine urinalysis examination, renal function and body fluid testing procedures.
RESTRICTIONS: Open to medical technology majors only

MEDT 401  CLINICAL PHYSIOLOGICAL CHEMISTRY I  3
Application and theory of automated techniques used in diagnostic and therapeutic
medicine. Emphasis on clinical procedures for carbohydrates, proteins, lipids, non-protein
amino acids, blood gases and pH, and electrolytes.
RESTRICTIONS: Open to medical technology majors only

MEDT 403  CLINICAL PHYSIOLOGICAL CHEMISTRY II  4
Application and theory of methodologies in enzymology, endocrinology and toxicology.
Relationship of normal and abnormal laboratory findings in organ functional tests.
PREREQ: MEDT401

MEDT 404  HEMATOLOGY I  2
Quantitative and qualitative study of the formed elements of the blood with emphasis on the
normal state, as well as the study of normal and abnormal coagulation and hemostasis
RESTRICTIONS: Open to medical technology majors only
MEDT 405  HEMATOLOGY II  2
Study of the pathophysiology of erythrocytic and leukocyte disorders and the laboratory findings of these disorders.
PREREQ: MEDT404.

MEDT 406  MEDICAL MICROBIOLOGY  3
Study of the occurrence and pathogenesis of human infectious and microorganisms associated with humans in health and disease
RESTRICTIONS: Open to medical technology majors only.

MEDT 409  IMMUNOHEMATOLOGY I  1
Study of antigens and antibody systems of human red cells and compatibility testing of blood for transfusion.
RESTRICTIONS: Open to medical technology majors only.

MEDT 410  CLINICAL PHYSIOLOGICAL CHEMISTRY LABORATORY I  2
Laboratory exercises that complement the topics covered in MEDT401.
COREQ: MEDT401.

MEDT 411  CLINICAL PHYSIOLOGICAL CHEMISTRY LABORATORY II  2
Laboratory exercises that complement the topics covered in MEDT403.
COREQ: MEDT403.

MEDT 414  HEMATOLOGY I LABORATORY  1
Study and implementation of laboratory procedures that correlate with the material taught in MEDT404.
COREQ: MEDT404.

MEDT 415  HEMATOLOGY II LABORATORY  2
Study and implementation of laboratory procedures in hematology consistent with the material taught in MEDT405.
COREQ: MEDT405.

MEDT 416  MEDICAL MICROBIOLOGY LABORATORY  2
Laboratory study of microorganisms important in the normal flora and infectious diseases of humans.
COREQ: MEDT406.

MEDT 418  MEDICAL TECHNOLOGY SENIOR SEMINAR  0 PF
Readings, case studies, career planning and orientation for clinical education.
RESTRICTIONS: Requires Senior and major status.

MEDT 419  IMMUNOHEMATOLOGY I LABORATORY  1
Laboratory procedures consistent with MEDT409.
COREQ: MEDT409.

MEDT 420  IMMUNOHEMATOLOGY II  1
Study of blood and component transfusions, their risks, complications and quality assurance. Also blood component therapy and testing of the neonate and adult.
PREREQ: MEDT409.

MEDT 421  IMMUNOHEMATOLOGY II LABORATORY  1
Laboratory procedures consistent with MEDT420.
COREQ: MEDT420.

MEDT 430  DIAGNOSTIC BACTERIOLOGY 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 MEDT146.
COREQ: MEDT431.

MEDT 431  DIAGNOSTIC BACTERIOLOGY AND MEDICAL MYCOLOGY LABORATORY  2
Study and implementation of laboratory procedures that correlate with the material taught in MEDT430.
COREQ: MEDT430.

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

MEDT 471  LABORATORY PRACTICE AND LEADERSHIP II  1
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 AND SEROLOGY PRACTICUM  1 PF
Clinical experience in the application of laboratory theory and techniques in urinalysis and serology.
PREREQ: MEDT380 and MEDT400.

MEDT 473  CLINICAL CHEMISTRY PRACTICUM  3 PF
Supervised experience in the application of laboratory theory and techniques 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: MEDT409 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 MEDT412.

MECHEICAL 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 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  3
Introduces computer-aided mechanical engineering by developing the student’s ability to 1) think visually, 2) communicate spatial information to an engineering 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  3
Intermediate-level development of the kineinematics 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  4
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  3
Kinematic analysis of mechanisms and machines, kinematic synthesis, cam design, gear train analysis and machine dynamics.
PREREQ: MEEG211.

MEEG 304  MACHINE DESIGN-ELEMENTS  3
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  4
MEEG 321  MATERIALS ENGINEERING  3
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 MEEG302.

MEEG 331  FLUID MECHANICS I  4
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  3
Compressible flows, isotropic 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  3
PREREQ: PHYS310.

MEEG 344  THERMODYNAMICS  3
PREREQ: PHYS310.

MEEG 346  THERMAL LAB  1
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  3
Linear algebra; vector field theory; Fourier series and partial differential equations in engineering applications.
PREREQ: MATH302.

MEEG 366  INDEPENDENT STUDY  1-6

MEEG 401  SENIOR DESIGN  6
In this capstone engineering practice course, student teams develop real engineering system designs; discover customer requirements; benchmark best practices; develop engineering specifications; generate concepts; and justify a specific concept. They then design, fabricate, assemble, test and improve an actual prototype.
PREREQ: MEEG304.
RESTRICTIONS: For majors only.

MEEG 411  STRUCTURAL MECHANICS FOR MECHANICAL AND AEROSPACE ENGINEERING  3
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 undereas vehicles, pressure vessels and other continuous structures.
PREREQ: MEEG211 and MEEG215.

MEEG 415  FINITE ELEMENT ANALYSIS  3
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  3
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  3
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 432  AERODYNAMICS  3
PREREQ: MEEG 331.

MEEG 433  BIOENGINEERING FLUIDS AND TRANSPORT  3
Anatomy and physiology of pulmonary, cardiac, genitourinary, cerebrospinal and anovulial systems. Application of fluid, heat and mass transport fundamentals to analysis of these biological systems.
PREREQ: MEEG332 and MEEG342.

MEEG 434  AIR POLLUTION PROCESSES  3
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  3
Fundamentals and application of combustion. Topics include thermodynamics; chemical kinetics; explosive 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 445  SENIOR RESEARCH I  3
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  3
Investigation of an experimental nature to be carried out and reported upon by each student.
RESTRICTIONS: Open to Seniors only.

MEEG 466  INDEPENDENT STUDY  1-6

MEEG 481  COMPUTER SOLUTION OF ENGINEERING PROBLEMS  3
Overview of numerical modelings 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  3
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 vitro, in vivo and mathematical modeling studies of joint system mechanics.

MEEG 483  ORTHOPEDIC BIOMECHANICS  3
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  3
Biomaterials for mechanical replacement of orthopedic 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 600  SEMINAR  1 PF

MEEG 610  INTERMEDIATE SOLID MECHANICS  3
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, plate problems in elasticity (Airy stress function) and elements of linear elastic fracture mechanics.

MEEG 619  SANDWICH STRUCTURES  3
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  3
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 615  MECHANICAL PROPERTIES OF MATERIALS  3
See MSE615 for course description.

MEEG 616  COMPOSITE MATERIALS STRUCTURES  3
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; hysteresis; thermal effects; stress analysis, buckling, vibrations and impact.

498
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 theory 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.

MEEG 620 INTERMEDIATE DYNAMICS
Reference frames, angular velocity, linear velocity, angular acceleration, linear acceleration, multibody systems, inertial properties, kinetic energy, equations of motion, generalized d’Alembert’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.

MEEG 623 NONLINEAR DYNAMICS AND CHAOS
Nonlinear dynamics and chaotic phenomena 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.

MEEG 624 CONTROL OF DYNAMIC SYSTEMS

MEEG 630 INTERMEDIATE FLUID MECHANICS

MEEG 632 BIOENGINEERING FLUIDS AND TRANSPORT
Anatomy and physiology of pulmonary, cardiac, genitourinary, 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.

MEEG 636 FLUID MECHANICS MEASUREMENTS
Point-wise 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 industry such as particle separation, dispersion, agglomeration, transport and handling. Particle measurements and characterization.

MEEG 640 INTERMEDIATE HEAT TRANSFER
Theory and equations of heat conduction, boundary conditions, steady and transient heat conduction, theory of convection, forced convection in laminar flows, derivation of convection 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.

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. Modeling 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.

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, pulltrusion and resin transfer molding.

MEEG 658 METALS AND ALLOYS

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.

MEEG 671 INTRODUCTION TO ROBOTICS
Topics include: rigid motions and transformations, forward kinematics, Denavit-Hartenberg representations, inverse kinematics, velocity kinematics, dynamics, independent joint control, multivariable control, force control. Requires familiarity with kinematics and basic dynamics. Restrictions: 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 pathology and the goals of surgical correction to counteract them are explored through in vitro, in vivo and mathematical modeling studies of joint system mechanics.

MEEG 683 ORTHOPEDIC BIOMECHANICS
Anatomy and physics 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.

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 biocompatibility, 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 MANUFACTURING PROCESSES AND SYSTEMS
Focus on 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.

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

MECH 813 THEORY OF ELASTICITY


MECH 814 THEORY OF PLASTICITY


PREREQ: MEEG 6410 or MEEG 813

MECH 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.

MECH 817 COMPOSITE MATERIALS

Introduction, thermoelastic behavior of laminated composites, statistical strength theories of continuous-fiber composites, short-fiber composites, hybrid composites, two-dimensional textile structural composites, three-dimensional textile structural composites, flexible composites, and nonlinear finite deformation of flexible composites. May be cross-listed with MEEG 817.

PREREQ: MEEG 610 or MEEG 616 or MEEG 817

MECH 818 PLATES AND SHELLS IN AEROSPACE STRUCTURES I


MECH 819 PLATES AND SHELLS IN AEROSPACE STRUCTURES II

General theory of thin shells from three-dimensional equations of elasticity; shells of revolution under axially symmetric loads; asymmetric loads; thermoelastic effects; general bending theory; membrane theory; inextensibility; Donnell equations; edge load solutions; orthotropic shells; laminated shells.

MECH 821 ADVANCED DYNAMICS

General principles of spatial dynamics. Lagrangian and Hamiltonian methods. Application to engineering problems.

MECH 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 Lagrangean method and normal coordinate analysis of complex systems.

MECH 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: MEEG 211, MEEG 311 and MAIE 525.

MECH 830 SPECIAL TOPICS IN FLUID MECHANICS

Offered occasionally and with varying subject matter. Topics may include turbulence, plasma kinetic theory, stability, etc.

MECH 831 FLUID DYNAMICS


PREREQ: MATH 630, MEEG 690, or permission of instructor.

MECH 832 FLUID DYNAMICS II

Rotational and irrotational flows, potential theory, airfoils, creeping motion, lubrication theory, wave motion, compressibility, supersonic flow and shock waves, and hydrodynamic stability.

MECH 840 SPECIAL TOPICS IN CONTINuum MECHANICS

Study of advanced principles of continuum mechanics in one or more special fields. Topics selected by instructor. Special subjects may include the general theory of constitutive equations, hyperelasticity, electroelasticity, hypoelasticity, simple and non-simple fluids, and solutions of special problems in these areas.

MECH 855 PRINCIPLES OF COMPOSITES MANUFACTURING

Fundamental principles and an application involving composites manufacturing will be introduced. Modeling 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.

MECH 856 NANOCRYSTALLINE AND NANOCOMPOSITE MATERIALS

Covers developments in polymer, ceramic and metal nano systems, current applications, major processing routes, and the novel mechanical and physical properties of nanocomposites.

MECH 862 ADVANCED ENGINEERING ANALYSIS

Emphasis on asymptotic and perturbation methods. Topics include among the following: Steepest descent and stationary phase; plane waves; asymptotic analysis of ODEs and PDEs using such methods as WKBJ, matched asymptotic expansions, Pade approximants, straining, and multiple scales; similarity methods; catastrophe theory; and chaos. Engineering applications.

MECH 868 RESEARCH

1-9

MECH 869 MASTER'S THESIS

1-6

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.

MECH 871 RANDOM VIBRATIONS

3


PREREQ: CIEG 311 (for CIEG students), MEEG 311 (for MECH students). Knowledge of MEEG 24 is desirable but not required.

MECH 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.

RESTRICTIONS: Permission of instructor required.

MECH 873 APPLIED NONLINEAR CONTROL

3


PREREQ: MEEG 824 or equivalent, MEEG 690 and MEEG 691, and permission of instructor.

MECH 881 ADVANCED MUSCULOSKELETAL BIOMECHANICS

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 613.

MECH 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 690.

MECH 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.

MECH 969 DOCTORAL DISSERTATION

1-12 PF

MILITARY SCIENCE

MLSC 105 INTRODUCTION TO LEADERSHIP

1

Introduction to leadership principles using case studies, historical perspectives and hands-on leadership opportunities. Learn to apply, 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 MLSC 105. Provides additional leadership opportunities and expands upon leadership theory. Learn basic rifle marksmanship, develop public presentation abilities, and continue physical fitness development. No military obligations associated with this course.

MLSC 205 BASIC LEADERSHIP

1

Enhance 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.
MSEG 206 BASIC LEADERSHIP II 1
Continues to build on the basics of MSLC205. 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.

MSEG 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.

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
Designed to prepare 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 cadet battalion 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: MLSC306.

MLSC 406 ADVANCED LEADERSHIP II 2
Builds on leadership skills from MLSC405 and helps complete the transition from cadet 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

MATERIALS SCIENCE

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 metallurgical 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 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 507 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. Electromagnetic, magnetic and optical effects in metals, semiconductors, ceramics, polymers and amorphous materials. Operation of basic electronic devices and semiconductors.

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

RESTRICTIONS: Requires graduate status.

MSEG 616 CHEMISTRY AND PHYSICS OF SURFACES AND INTERFACES 3
See CIEG616 for course description.

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

MSSS 205 SCIENCE AND THE DETECTION OF ART FORGERIES 3
Concepts from many scientific disciplines are useful for interpreting works of art. Analytical techniques based on those concepts often reveal art forgeries. Case studies will use basic scientific principles to investigate a wide variety of known or alleged art forgeries. May be cross-listed with ARTH205.

MSSS 206 QUEER SEXUAL IMAGERY IN THE VISUAL ARTS 3
Introduction to the diversities of representation of the human body in western visual art with an emphasis on coded as well as explicit images of queer sexuality.

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 vs. team work, and networking and mentorship in accomplishing career goals. Includes guest speakers from local industries, technical writing and oral communication exercises.

MSEG 666 SPECIAL PROBLEM 1-12

MSEG 803 EQUILIBRIA IN MATERIAL SYSTEMS 3
PREREQ: MSEG302.

MSEG 804 KINETICS IN MATERIAL SYSTEMS 3
PREREQ: MSEG302.

MSEG 806 PHYSICAL PROPERTIES OF SOLIDS 3

MSEG 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; band-gap engineering; novel materials systems; electron emission; particularly field emission.
PREREQ: MSEG607.

MSEG 811 ADVANCED TOPICS IN MATERIALS 1-3
Discussion of a topic of current interest in the science or engineering of materials.

MSEG 817 COMPOSITE MATERIALS 3
See MEEG817 for course description.

MSEG 821 DIFFRACTION OF RADIATION BY MATTER 3
Theory and analysis of diffraction from ideal and imperfect crystals, gases and liquids, and other atomic aggregates.

MSEG 823 TRANSMISSION ELECTRON MICROSCOPY IN MATERIALS SCIENCE 3
May be cross-listed with CHEG823.

MSEG 866 SPECIAL PROBLEM 1-12

MSEG 868 RESEARCH 1-9

MSEG 964 PRE-CANDIDACY STUDY 3-12 PF
Research and readings in preparation for 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.

MSEG 969 DOCTORAL DISSERTATION 1-12 PF

MSS 403 HISTORY, PHILOSOPHY, FUNCTIONS AND FUTURE OF MUSEUMS 3
Introduction to philosophy, purposes, structure, historical development and future of museums, and botanical and zoological gardens. Examinations of function of conservation, research, exhibition, interpretation, and social/cultural services; museum field growth.
May be cross-listed with ARTH403 and/or HIS1403.

MSS 408 PUBLIC HISTORY: RESOURCES, RESEARCH AND PRACTICE 3
See HIST408 for course description.

MSS 444 TECHNOLOGY OF CULTURAL MATERIALS: GLASS AND CERAMICS 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 ARTH444.

MSS 445 TECHNOLOGY OF CULTURAL MATERIALS: MEALS 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 ARTH445.

MSS 464 MUSEUM STUDIES INTERNSHIP 3
Internship practicum supplementing theoretical and methodological background in administration, collections management, exhibition, research, interpretation, and public programming and services of museums. Students intern at the University museum or other acceptable museums, related institutions or organizations in the United States. Requires permission of instructor.

MSS 485 COLOR MIXING AND MATCHING 3
Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors without instruments. Pigments, dyes and the manufacture of paint. Major topics include color interaction and the Munsell system of color description.
May be cross-listed with ART 426 and/or ARTH485. RESTRICTIONS: Requires permission of instructor.

MSS 488 STUDIOS MATERIALS AND TECHNIQUES OF PAINTING I 3
Major masters and the materials, tools, supports and techniques of architectural painting 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 ART 427, ARTH488, and/or ARTH489. RESTRICTIONS: Requires permission of instructor.

MSS 489 STUDIOS MATERIALS AND TECHNIQUES OF PAINTING II 3
Major masters and the materials, tools and techniques of indirect and direct oil painting. Time frame: 1500 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 ART 428, ARTH489, and/or ARTH489. RESTRICTIONS: Requires permission of instructor.

MSS 490 STUDIOS 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, lithograph and wood engraving. Studio reconstructions, lectures and library research.
May be cross-listed with ART 429, ARTH490, and/or ARTH490. RESTRICTIONS: Requires permission of instructor.

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

MSS 608 PUBLIC HISTORY: RESOURCES, RESEARCH, AND PRACTICE 3
See HIST608 for course description.

MSS 629 SEMINAR IN HISTORIC PRESERVATION 3
See UAPP629 for course description.
MSST 644  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 ARTH644 and/or ARCT644.

MSST 645  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 functions. Case studies from a wide variety of cultural traditions. May be cross-listed with ARTH645 and/or ARCT645.

MSST 680  STUDIO IN THE MATERIALS AND TECHNIQUES OF DRAWING IN THE WEST  3
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, erasers and fixatives. Studio reconstructions of masterworks, lectures and library research. May be cross-listed with ARTH680 and/or ARTH680.

RS Restrictions: Requires permission of instructor.

MSST 681  MATERIALS AND TECHNIQUES OF THE CONTEMPORARY PAINTER AND DRAUGHTSMAN  3

MSST 685  COLOR MIXING AND MATCHING  3
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 ARTH685 and/or ARTH685.

RS Restrictions: Requires permission of instructor.

MSST 688  STUDIO MATERIALS AND TECHNIQUES OF PAINTING I  3
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 ARTH688, ARTH688, and/or ARTH688.

RS Restrictions: Requires permission of instructor.

MSST 689  STUDIO MATERIALS AND TECHNIQUES OF PAINTING II  3
Major masters and the materials, tools and techniques of indirect and direct oil painting. Time frame: 1500 to the present. 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 ARTH689, ARTH689, and/or ARTH689.

RS Restrictions: Requires permission of instructor.

MSST 690  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. 1400-20th century. 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 ARTH690, ARTH690, and/or ARTH690.

RS Restrictions: Requires permission of instructor.

MSST 801  MUSEUM CURATORSHIP: COLLECTIONS MANAGEMENT  3
A course on collections management theory and practice 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.

RS Restrictions: Open to graduate students only.

MSST 802  LEADERSHIP AND MANAGEMENT OF MUSEUMS  3
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. Requires: Open to graduate students only. Includes field trips and team task force project.

MSST 803  MUSEUMS AND MODERN TECHNOLOGY  3
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  3
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.

RS Restrictions: Open to graduate students only. Requires at least one semester course in museum studies and permission of instructor.

MSST 805  HISTORICAL PROPERTIES  3
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.

RS Restrictions: Open to graduate students only.

MSST 807  MUSEUM CURATORSHIP: TEMPORARY AND ECONOMICAL EXHIBITS  3
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.

RS Restrictions: Open to graduate students only.

MSST 808  MUSEUM EDUCATION AND INTERPRETATION  3
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.

RS Restrictions: Open to graduate students only.

MSST 810  ENVIRONMENTAL INSTITUTION MANAGEMENT  6
Seminars at Delaware Nature Society headquarters with staff and guest lecturers including attorneys, investment counselors, University faculty and museum lecturers. 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.

RS Restrictions: Open to graduate students only. Permission of instructor required.

MUSIC EDUCATION

MUED 179  FRESHMEN SEMINAR IN MUSIC EDUCATION  1
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.

MUED 279  PRACTICUM IN MUSIC EDUCATION  3
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.

RS Restrictions: Requires permission of instructor.

MUED 336  CHORAL CONDUCTING  2
Specific problems in conducting choral literature. Comparative analysis of works to be conducted. PREREQ: MUSC335

RS Restrictions: For vocal music education majors.

MUED 337  INSTRUMENTAL CONDUCTING  2
Specific problems in conducting instrumental literature. Practical application of conducting techniques through supervised conducting of instrumental ensembles. PREREQ: MUSC335

RS Restrictions: For instrumental music education majors.

MUED 366  INDEPENDENT STUDY  1-3

MUED 379  MUSIC IN THE ELEMENTARY AND JUNIOR HIGH (OR MIDDLE) SCHOOL  3
Introduction to music materials and approaches through clinical experiences. PREREQ: MUED279

COREQ: MUED336 or MUED337

RS Restrictions: For music majors.

503
MUED 390  MUSIC IN THE ELEMENTARY SCHOOL  3
Introduction to music materials and approaches through clinical experiences.
RESTRICTIONS: For elementary education and child development majors.

MUED 391  AESTHETICS AND EDUCATION  3
Exploration of the philosophical basis of the performing and visual arts in education and
strategies for their integration into core curriculum subjects. Satisfies the Fine Arts requirement
for Elementary Education majors.

MUED 479  SECONDARY MUSIC MATERIALS AND APPROACHES  3
Procedures and materials used for teaching music in the secondary school.
PREREQ: MUED337, and MUED336 or MUED337.
RESTRICTIONS: Requires permission of instructor.

MUED 574  MUSIC CONCEPTS IN THE ELEMENTARY SCHOOL  3
Methods and materials for developing children's understanding of music concepts by
involvement in listening to, performing and describing musical sound events.
RESTRICTIONS: For experienced teachers.

MUSIC

MUSC 095  BASIC HARMONY AND EAR-TRAINING  3 R
Designed to establish or re-establish basic harmony and ear-training skills.
RESTRICTIONS: For beginning music majors and minors. Requires Musicianship Test
Credit does not apply toward degree.

MUSC 100  RECITAL ATTENDANCE  0 PF
A recital experience; see Department of Music Student Handbook for details.
RESTRICTIONS: May be repeated.

MUSC 101  APPRECIATION OF MUSIC  3
Introduction to Western music literature through a non-technical presentation of various musical
styles and forms.

MUSC 102  APPRECIATION OF MUSIC  3
Music literature through a non-technical presentation of various musical styles and forms.
Continuation of MUSC101 with emphasis on the larger forms: symphonies, operas, oratorios,
concertos - and the 20th century.
PREREQ: MUSC101.

MUSC 103  INTRODUCTION TO OPERA  3
Explores the world of opera including categories of singers; types of operas, e.g., opera seria,
opera buffa, singspiel; and the roles of the chorus. Includes experience seeing an opera
performed live.

MUSC 104  INTRODUCTION TO OPERA II  3
Introduction to opera, concentrating on opera comique, singspiel, opetta, baroque opera, seria,
and Wagnerian music drama. Explores philosophies associated with music in the context of
opera. Time span covered is 1607 to present.

MUSC 105  FUNDAMENTALS OF MUSIC I  3
Introduction into the elements of music theory including ear training, music reading and
harmony with keyboard application. RESTRICTIONS: Designed for nonmusic majors.

MUSC 106  FUNDAMENTALS OF MUSIC II  3
Continuation of MUSC105. Survey and analytical approach to music styles. Composing
original works for voice and instruments. PREREQ: MUSC105.

MUSC 107  HISTORY OF ROCK  3
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

MUSC 108  UNIVERSITY SINGERS  1
Members enter by audition. University Singers is a chorus of sopranos and altos that performs
its own concerts and may also perform with other choirs.
RESTRICTIONS: May be repeated for credit.

MUSC 109  CHORAL UNION  1
Members enter by audition. Choral Union is a chorus of 100+ voices that rehearses on
Monday nights. The Union performs large-scale choral works. Smaller sections perform
independently as well.
RESTRICTIONS: May be repeated for credit.

MUSC 110  CHORALE  1
Members enter by audition. Chorale is the university's most select chorus of mixed voices.
RESTRICTIONS: May be repeated for credit.

MUSC 113  MARCHING BAND  1
RESTRICTIONS: Contact the Director for detailed information. All interested percussionists,
colorguard and twirlers must audition. May be repeated for credit.

MUSC 114  SYMPHONIC BAND  1
The ensemble performs standard concert literature as well as new compositions. During fall
semester the ensemble meets one day a week and performs one full concert. The ensemble
participates in the Department of Music's CALLIOPE concert.
RESTRICTIONS: Requires audition. May be repeated for credit.

MUSC 115  WIND ENSEMBLE: ORCHESTRAL WINDS AND PERCUSSION  1
The Wind Ensemble is a select 45-member group of woodwind, brass and percussion players
that performs original band music, chamber music and transcriptions. The Orchestral Winds
and Percussion consists of select players from the Wind Ensemble, who form the wind and
percussion sections of the University Orchestra.
RESTRICTIONS: The Wind Ensemble requires audition and may be repeated for credit.

MUSC 116  JAZZ ENSEMBLE  1
Study and performance of the diverse styles characteristic of the medium.
RESTRICTIONS: Requires audition. May be repeated for credit.

MUSC 117  UNIVERSITY ORCHESTRA  1
Rehearsal and performance of representative works for orchestra.
RESTRICTIONS: Requires audition. May be repeated for credit.

MUSC 118  PERCUSSION ENSEMBLE  1
Study and performance of works for percussion instruments.
RESTRICTIONS: Requires audition. May be repeated for credit.

MUSC 121  GAMELAN ENSEMBLE  1
Gamelan is the largest instrumental ensemble from Southeast Asia, and is considered the
"orchestra of the Eastern world." This is a performing ensemble, dealing with traditional and
contemporary Indonesian and Balinese literature.
RESTRICTIONS: Open to anyone without prior musical experience. May be repeated for credit.

MUSC 125  COLLEGIATE 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.

MUSC 161  PRIVATE STUDY  1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an
orchestral instrument. RESTRICTIONS: Contact department to register for correct number of credit hours. Requires audition.

MUSC 162  PRIVATE STUDY  1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an
orchestral instrument. PREREQ: MUSC161.

MUSC 171  DICTION: ENGLISH AND ITALIAN  1
Study of pronunciation rules for singing in English and Italian includes practicum.
COREQ: Enrollment in applied study.

MUSC 173  CLASS VOICE  1
Fundamentals and techniques of singing. RESTRICTIONS: For nonmajors.

MUSC 174  CLASS VOICE: BEGINNING  1
Fundamentals of singing for the nonvocal music major. Study of basic technique, repertoire
and function of vocal mechanism. RESTRICTIONS: Requires permission of instructor for nonmajors. Requires one semester of University vocal experience.

MUSC 175  CLASS PIANO: ELEMENTARY I  1
Beginning piano primarily for the vocal or instrumental music major. Basic techniques,
reading, transposition and playing by ear. PREREQ: MUSC105 or corequisite of MUSC195. Preference for enrollment given to music majors.
RESTRICTIONS: None.

MUSC 176  CLASS PIANO: ELEMENTARY II  1
A continuation of MUSC175. Scale and arpeggio playing, keyboard harmony, repertoire of
pieces appropriate to technical ability. PREREQ: MUSC175 and MUSC195.
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.

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

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 hymns playing.
RESTRICTIONS: Requires permission of instructor.

MUSC 181  APPLIED JAZZ STYLES/TECHNIQUES I  2
Private studio instruction covering techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
RESTRICTIONS: Requires audition.

MUSC 185  EAR TRAINING AND SIGHT SINGING I  2
Techniques of sight-reading and music reading skills. Development of ability in theural recognition of melody, harmony and rhythm.
PREREQ: MUSC95, or passing grade on departmental musicality test.
COREQ: MUSC195.
RESTRICTIONS: Requires permission of instructor.

MUSC 186  EAR TRAINING AND SIGHT SINGING II  2
Techniques of sight-reading and music reading skills. Development of ability in theural recognition of melody, harmony and rhythm.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC196.

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.

MUSC 194  SIGHT READING AT THE KEYBOARD II  1
Continuation of MUSC193.
PREREQ: MUSC193.

MUSC 195  HARMONY I  3
Review of music fundamentals. Diatonic harmony, including parts-writing with keyboard application. Chord structures and functional relationships Basic melodic and contrapuntal compositional techniques Writing, playing and analysis.
PREREQ: MUSC95, MUSC105, or passing grade on departmental musicality test.
COREQ: MUSC185.

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: MUSC196.

MUSC 197  JAZZ HARMONY  3
Study of elementary aspects of melody, harmony, texture, dynamics, rhythm and form in selected jazz and American popular music literature, development of elementary aural-perceptual and compositional skills related to jazz and American popular music.
PREREQ: MUSC105.

MUSC 198  SEMINAR IN MUSIC COMPOSITION  1
An exploration of contemporary classical music and ethnic musics, score and part preparation, practical steps towards mounting composition performances, notational computer software, career opportunities, PR and business-related skills and publishing.
RESTRICTIONS: Open only to Music Theory/Composition majors.

MUSC 199  SEMINAR IN MUSIC COMPOSITION  1
An exploration of contemporary classical music and ethnic musics, score and part preparation, practical steps towards mounting composition performances, notational computer software, career opportunities, PR and business-related skills and publishing.
PREREQ: Open only to Music Theory/Composition majors.

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 performances/demonstrations Goal is the understanding and appreciation of various world musics.
PREREQ: MUSC105

MUSC 206  MUSIC OF CHINA, KOREA AND JAPAN  3
Systematically examines the origin and historical development of the musical cultures of the Far East. Studies how the musical and cultural influence of Chinese music has had an enormous impact on the development of such cultures in Korea and Japan.

MUSC 207  HISTORY OF JAZZ  3
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.
PREREQ: MUSC105

MUSC 208  HISTORY OF THE AMERICAN MUSICAL THEATRE  3
The musical-dramatic forms of the 18th, 19th and 20th centuries in the United States and their impact on the modern musical theatre. Complete works read in class and compared to a series of criteria found in successful modern shows. Comparison of older and current works May be cross-listed with THEA208.

MUSC 209  HISTORY OF SPANISH MUSIC  3
Covers the most outstanding traditions of Spanish music, including Arab-influenced Andalucian music, 18th-century music, schools of the "Zarzuela", 18th-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  3
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 an LONDON Semester, will include attendance at variety of London performances.
RESTRICTIONS: Requires permission of instructor.

MUSC 211  INTRODUCTION TO MUSIC HISTORY  3
Survey of selected works in music history with emphasis on selected basic terminology, forms and style changes, through score reading and listening.
PREREQ: MUSC105

MUSC 212  HISTORY OF LITURGY AND HYMNS  3
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 214  STRINGED INSTRUMENTS CLASS: VIOLIN, VIOLA, CELLO, BASS  1
Development of performing and teaching skills.
RESTRICTIONS: Open to only to students whose major requires this course.

MUSC 215  HIGH BRASS INSTRUMENTS CLASS  1
Development of performing and teaching skills.
RESTRICTIONS: MUSC215 and MUSC216 to be taken consecutively in one academic year.
Open only to students whose major requires this course.

MUSC 216  LOW BRASS INSTRUMENTS CLASS I  1
Development of performing and teaching skills.
RESTRICTIONS: MUSC215 and MUSC216 to be taken consecutively in one academic year.
Open only to students whose major requires this course.

MUSC 216  LOW BRASS INSTRUMENTS CLASS II  1
Development of performing and teaching skills.
RESTRICTIONS: MUSC217 and MUSC218 to be taken consecutively in one academic year.
Open only to students whose major requires this course.

MUSC 217  WOODWIND INSTRUMENTS CLASS I  1
Development of performing and teaching skills.
RESTRICTIONS: MUSC217 and MUSC218 to be taken consecutively in one academic year.
Open only to students whose major requires this course.

MUSC 218  WOODWIND INSTRUMENTS CLASS II  1
Development of performing and teaching skills.
RESTRICTIONS: MUSC217 and MUSC218 to be taken consecutively in one academic year.
Open only to students whose major requires this course.

MUSC 219  PERCUSSION INSTRUMENTS  1
Development of performing and teaching skills.
RESTRICTIONS: Open only to students whose major requires this course.

MUSC 241  ACCOMPANYING CHAMBER MUSIC: PIANO  1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: SIGHT-READING Placement Test.
RESTRICTIONS: First course of a six-semester sequence. Requires permission of instructor.

MUSC 242  ACCOMPANYING CHAMBER MUSIC: PIANO  1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: MUSC241.
RESTRICTIONS: Requires permission of instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 261</td>
<td>Private Study</td>
<td>1-8</td>
<td>The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class. Coreq: MUSC162. Restrictions: Contact department to register for correct number of credit hours.</td>
</tr>
<tr>
<td>MUSC 262</td>
<td>Private Study</td>
<td>1-8</td>
<td>The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class. Coreq: MUSC261. Restrictions: Contact department to register for correct number of credit hours.</td>
</tr>
<tr>
<td>MUSC 271</td>
<td>Diction: German</td>
<td>1</td>
<td>A study of pronunciation rules for singing in German. Includes practical work. Coreq: Enrollment in applied study.</td>
</tr>
<tr>
<td>MUSC 275</td>
<td>Class Piano: Intermediate I</td>
<td>1</td>
<td>Piano techniques applicable to the levels and needs of the students; a continuation of reading and transposition; and improvisation and repertory of grade two pieces. Coreq: MUSC275.</td>
</tr>
<tr>
<td>MUSC 279</td>
<td>Introduction to the Organ</td>
<td>2</td>
<td>Designed to provide information about the organ: its history, use and literature as well as tonal and mechanical aspects of its design. Coreq: MUSC279.</td>
</tr>
<tr>
<td>MUSC 285</td>
<td>Advanced Ear Training and Sight Singing I</td>
<td>2</td>
<td>Continuation of MUSC185 and MUSC186. Coreq: MUSC186 and MUSC196.</td>
</tr>
<tr>
<td>MUSC 286</td>
<td>Advanced Ear Training and Sight Singing II</td>
<td>2</td>
<td>Continuation of MUSC185, MUSC186 and MUSC285. Coreq: MUSC285 and MUSC295.</td>
</tr>
<tr>
<td>MUSC 287</td>
<td>Music Technology I</td>
<td>3</td>
<td>Overview and experience with commercially-available music-related hardware and software. Coreq: MUSC105 or MUSC195.</td>
</tr>
<tr>
<td>MUSC 291</td>
<td>Practicum in Church Music</td>
<td>1</td>
<td>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. Coreq: MUSC197.</td>
</tr>
<tr>
<td>MUSC 292</td>
<td>Organ Improvisation and Service Playing</td>
<td>2</td>
<td>Student learns and applies skills used in improvising at the organ and playing for church services. A basic conducting component is included. Restrictions: Open only to Music Theory/Composition majors.</td>
</tr>
<tr>
<td>MUSC 293</td>
<td>Jazz Improvisation I</td>
<td>3</td>
<td>A comprehensive study of jazz improvisation vocabulary and techniques which will result in the student being able to improvise in a stylistically acceptable manner over a given set of chord progressions. Coreq: MUSC293.</td>
</tr>
<tr>
<td>MUSC 294</td>
<td>Jazz Improvisation II</td>
<td>3</td>
<td>An advanced study of jazz improvisation vocabulary and techniques which will result in the student being able to improvise in a stylistically acceptable manner. Coreq: MUSC293.</td>
</tr>
<tr>
<td>MUSC 298</td>
<td>Seminar in Music Composition</td>
<td>1</td>
<td>An exploration of contemporary classical and ethnic musics, score and part preparation, practical steps towards mounting composition performances, notational computer software, career opportunities, PR and business-related skills, and publishing. Coreq: MUSC186.</td>
</tr>
<tr>
<td>MUSC 301</td>
<td>Junior Recital</td>
<td>0 PF</td>
<td>A 30-minute public recital. Restrictions: Requires Junior status.</td>
</tr>
<tr>
<td>MUSC 302</td>
<td>Women in Music: An Alternate Survey</td>
<td>3</td>
<td>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 alternately encouraged and suppressed women's creativity. May be cross-listed with WOMS302.</td>
</tr>
<tr>
<td>MUSC 309</td>
<td>Patterns of Patronage</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Churches and Cathedrals of London</td>
<td>3</td>
<td>A study of ecclesiastical architecture of the 12th-20th centuries, noting structure, architectural style &amp; historical role, as well as the way in which music, liturgy and the visual arts unfold within each building. Restrictions: Taught in London only.</td>
</tr>
<tr>
<td>MUSC 311</td>
<td>Music History: 400 through 1600</td>
<td>3</td>
<td>The history of musical style and theory in the Middle Ages (5th through 14th centuries) and the Renaissance (15th and 16th centuries). Coreq: MUSC211 or MUSC101.</td>
</tr>
<tr>
<td>MUSC 312</td>
<td>Music History: 1600 through 1827</td>
<td>3</td>
<td>The history of musical style and theory during the Baroque period (1600-1750), and the Classic period through the death of Beethoven (1827). Coreq: MUSC211 or MUSC101.</td>
</tr>
<tr>
<td>MUSC 313</td>
<td>Music History: 1825 to the Present</td>
<td>3</td>
<td>The Romantic era, Impressionism and the 20th century. Musical thought and style from 1825 to the present. Coreq: MUSC211 or MUSC101.</td>
</tr>
<tr>
<td>MUSC 321</td>
<td>Ensemble: Instrumental, Piano, or Vocal</td>
<td>1</td>
<td>Performance of chamber literature for instrument, piano or voice. Restrictions: May be repeated for credit.</td>
</tr>
<tr>
<td>MUSC 327</td>
<td>German Lieder</td>
<td>2</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 328</td>
<td>Choral Literature</td>
<td>2</td>
<td>Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1500. Coreq: MUSC211.</td>
</tr>
</tbody>
</table>
MUSC 331 ORCHESTRATION
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.

MUSC 335 BASIC Conducting
The principles of conducting and score reading
PREREQ: MUSC286 and MUSC296.

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

MUSC 341 ACCOMPANYING CHAMBER Music: Piano
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC242.

MUSC 342 ACCOMPANYING CHAMBER Music: Piano
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC242.

MUSC 345 HISTORY OF THEATRE: AMERICAN Musical Theatre
Musical-dramatic forms of the 18th, 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 older and current works. May be cross-listed with THEA345.

MUSC 361 PRIVATE Study
The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC262.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 362 PRIVATE Study
The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC361.
RESTRICTIONS: Contact department to register for correct number of credit hours.

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

MUSC 364 KEYBOARD Literature II
Intensive study of one composer or style period from the keyboard repertory. Content varies from year to year.
PREREQ: MUSC363.

MUSC 366 INDEPENDENT Study
1-3

MUSC 387 MUSIC Technology II
Explores intermediate to advanced applications of music technology including professional level implementation of MIDI hardware and software. Topics include multipoint 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 388 PRINCIPLES OF Music Industry Practice
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 the influence of professional organizations. Emphasis on framework for interaction among writers, artists, performers, publishers, record companies, producers.

MUSC 389 ELEMENTS OF Music Management
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
See ARSC390 for course description
May be cross-listed with ENGL391

MUSC 392 CONTRAPUNTAL WRITING
Contrapuntal techniques with emphasis on 16th- and 18th-century styles and forms.
PREREQ: MUSC295.

MUSC 393 KEYBOARD Harmony
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.

MUSC 394 KEYBOARD Harmony II
An advanced practical course for the development of facility in applying knowledge of harmony to the keyboard.
PREREQ: MUSC393.

MUSC 395 FORM Analysis
Structure of homophonic and polyphonic music representing different periods of musical history.
PREREQ: MUSC296.

MUSC 397 CONTEMPORARY Harmony
Styles, harmonic principles and techniques in 20th century music.
PREREQ: MUSC296.

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
A 60-minute public recital.
RESTRICTIONS: Requires Senior status.

MUSC 403 CHAMBER Music Literature
Survey of chamber music literature from the 17th century to the present.
PREREQ: MUSC312, MUSC313.
RESTRICTIONS: Requires permission of instructor.

MUSC 405 SYMPHONIC Literature
Historical and structural analysis of major symphonic works from the 18th century to the present.
PREREQ: MUSC312, MUSC313.
RESTRICTIONS: Requires permission of instructor.

MUSC 407 CONTEMPORARY Music Literature
Analysis of styles and techniques of contemporary composers beginning with compositions of the late 1950s.
PREREQ: MUSC313 or permission of instructor.

MUSC 420 ADVANCED Composition
Creative writing in the vocal and instrumental media with individual and group criticism.
PREREQ: MUSC397.
RESTRICTIONS: May be repeated for up to nine credit hours.

MUSC 421 SPECIAL Projects in Music Theory
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 427 FRENCH Art Song
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 Poulenc.
PREREQ: MUSC485.

MUSC 428 TWENTIETH-CENTURY Art Song
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.

MUSC 441 ACCOMPANYING CHAMBER Music: Piano
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: MUSC342.

MUSC 442 ACCOMPANYING CHAMBER Music: Piano
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: MUSC441.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>MUSC 443</td>
<td>Chamber Music Performance</td>
<td>1</td>
<td>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. Open to both majors and non-majors and open to voice, string, piano, and wind players. RESTRICTIONS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MUSC 461</td>
<td>Private Study</td>
<td>1-8</td>
<td>The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class. PREREQ: MUSC362. RESTRICTIONS: Contact department to register for correct number of credit hours.</td>
</tr>
<tr>
<td>MUSC 462</td>
<td>Private Study</td>
<td>1-8</td>
<td>The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class. PREREQ: MUSC461. RESTRICTIONS: Contact department to register for correct number of credit hours.</td>
</tr>
<tr>
<td>MUSC 464</td>
<td>Internship</td>
<td>1-3</td>
<td>Students are placed with performing arts organizations or music businesses both within and outside the state. Requires participation in Careers Colloquium, an informal series of lectures/roundtable discussions with guests currently employed in the music industry or with performing arts organizations. RESTRICTIONS: Open to music management studies minors only.</td>
</tr>
<tr>
<td>MUSC 480</td>
<td>Vocal Pedagogy</td>
<td>3</td>
<td>Designed for those who plan to work with the singing voice. Includes vocal research, comparative pedagogy, observation of teaching and practical teaching experience.</td>
</tr>
<tr>
<td>MUSC 481</td>
<td>Pedagogy and Literature</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 485</td>
<td>Pedagogy of Theory</td>
<td>3</td>
<td>Materials, organization, techniques and problems of teaching high school and basic college theory courses. Attention to sight singing, ear training, keyboard and form and analysis materials. Observation and teaching of theory courses at the Freshman and Sophomore levels. PREREQ: MUSC286 and MUSC296.</td>
</tr>
<tr>
<td>MUSC 489</td>
<td>Opera Workshop</td>
<td>1-3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 561</td>
<td>Advanced Private Study</td>
<td>1-4</td>
<td>Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument, e.g., Private Study (Piano). PREREQ: MUSC462.</td>
</tr>
<tr>
<td>MUSC 603</td>
<td>Chamber Music Literature</td>
<td>3</td>
<td>Survey of chamber music literature from the 17th century to the present. RESTRICTIONS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MUSC 605</td>
<td>Symphonic Literature</td>
<td>3</td>
<td>Historical and structural analysis of major symphonic works from the 18th century to the present. RESTRICTIONS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MUSC 606</td>
<td>Wind Literature</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 611</td>
<td>Studies in Music History</td>
<td>3</td>
<td>A survey of representative compositions from various periods of music history. Includes a study of the relationship of music to the socio-cultural background of each epoch and discussions of performance practice problems. Topics of study may change with each time of offering.</td>
</tr>
<tr>
<td>MUSC 620</td>
<td>Large Ensemble</td>
<td>1</td>
<td>Participation as a performer in a large ensemble. RESTRICTIONS: Entry audition required.</td>
</tr>
<tr>
<td>MUSC 621</td>
<td>Chamber Ensemble</td>
<td>1</td>
<td>Participation as a performer in a chamber ensemble. RESTRICTIONS: Entry audition required.</td>
</tr>
<tr>
<td>MUSC 622</td>
<td>Materials and Methods of Research</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 637</td>
<td>Advanced Instrumental Conducting</td>
<td>3</td>
<td>Advanced conducting techniques for directors of instrumental performing groups. RESTRICTIONS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MUSC 638</td>
<td>Large Ensemble Practical</td>
<td>1</td>
<td>Participation in a large ensemble and seminar with ensemble director. RESTRICTIONS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MUSC 640</td>
<td>History and Philosophy of Music Education</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 661</td>
<td>Advanced Private Study</td>
<td>1-4</td>
<td>Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument, e.g., Private Study (Piano). RESTRICTIONS: Requires audition.</td>
</tr>
<tr>
<td>MUSC 662</td>
<td>Advanced Private Study</td>
<td>1-4</td>
<td>Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument, e.g., Private Study (Piano). PREREQ: MUSC661.</td>
</tr>
<tr>
<td>MUSC 675</td>
<td>General Music K-12</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 676</td>
<td>Seminar in Music Education</td>
<td>3</td>
<td>Advanced topics in music education. RESTRICTIONS: Requires permission of instructor.</td>
</tr>
<tr>
<td>MUSC 679</td>
<td>Professional Improvement Project I</td>
<td>3</td>
<td>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 MUSC680 as an alternative to thesis option.</td>
</tr>
<tr>
<td>MUSC 680</td>
<td>Professional Improvement Project II</td>
<td>3</td>
<td>Implementation of the portfolio developed in MUSC679. PREREQ: MUSC679. RESTRICTIONS: Taken in sequence with MUSC679 as an alternative to thesis option.</td>
</tr>
<tr>
<td>MUSC 681</td>
<td>Pedagogy and Literature</td>
<td>3</td>
<td>The study of teaching methods and literature (music scores, books and other media). Shows teaching skills needed at the university level and lower.</td>
</tr>
<tr>
<td>MUSC 695</td>
<td>Advanced Analytical Techniques</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>MUSC 869</td>
<td>Master's Thesis</td>
<td>1-6</td>
<td>A six-year study leading to a thesis in music, with the thesis to be written on a topic selected in conjunction with the instructor. RELATIONSHIPS: Requires permission of instructor.</td>
</tr>
</tbody>
</table>
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. Introduction to concepts of a profession and relevant professional organizations.
RESTRICTIONS: Open to Freshmen and Sophomores.

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 240  INTRODUCTION TO CLINICAL DIETICS  3
Orientation to clinical dietetics; basic skills required for nutritional care; nutritional assessment, dietary counseling, clinical simulations, nutritional care plans and composition of basic therapeutic diets.
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 restaurateurs and individuals as well as class preparation. Field trips to markets and ethnic food stores.
COREQ: NTDT 225.

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 120 and a course in biology.

NTDT 310  NUTRITION AND ACTIVITY  3
Energy and nutrient needs for activity with 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: NTDT 120 and a physical 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: NTDT 120 and NTDT 201.

NTDT 322  MANAGEMENT OF FOOD AND NUTRITION SERVICES  3
Organization and administration of not-for-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: NTDT 200 and NTDT 201.

NTDT 325  LABORATORY IN QUANTITY FOOD PRODUCTION AND SERVICE  1
Laboratory experience in quantity food production and delivery systems with emphasis on equipment, principles of safe food handling, quality standards and controls and menu planning.
COREQ: NTDT 121.

NTDT 326  ONLINE 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: NTDT 121.

NTDT 328  FOOD SERVICE FACILITY DESIGN  1
Development of quantity food production kitchen design. Considerations include material flow, equipment requirements, functional areas, safety and sanitation, and energy and water resources.
PREREQ: NTDT 205.
COREQ: NTDT 121.

NTDT 330  NUTRITION COUNSELING  3
Theories, skills and techniques of nutrition interviewing and counseling applied to changing food behaviors.
PREREQ: NTDT 200 and NTDT 201.

NTDT 350  NUTRITION AND OLDER ADULTS  3
Discussion of the physiology of aging on fundamental nutrition process, food and nutrient requirements and intakes, assessment of nutritional status, and nutrition related problems of older adults.
PREREQ: NTDT 200 and BISC 106 or BISC 276.

NTDT 356  INDEPENDENT STUDY  1-6

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: NTDT 200, CHEM 214 and CHEM 216.

NTDT 401  MICRONUTRIENTS  3
Mechanisms and interactions of vitamins and minerals in cellular metabolism, scientific bases of nutrient requirements during the life cycle.
PREREQ: NTDT 400.

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.

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: NTDT 400 and BISC 276.

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: NTDT 400 and a course in statistics.

NTDT 430  NUTRITION CLINIC PRACTICUM  1-3
Experience in on-going activities of the University of Delaware Nutrition Clinic including client counseling, group presentations, nutrition education materials development and research activities.
PREREQ: NTDT 330.
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: NTDT 400.

NTDT 440  NUTRITION AND DISEASE  3
Examination of the metabolic and physiological aberrations in selected conditions and implications for medical nutrition therapy.
PREREQ: NTDT 400 and BISC 106 or BISC 276.

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: NTDT 200.

NTDT 450  MEDICAL NUTRITION THERAPY I  3
PREREQ: NTDT 400, BISC 276.
COREQ: NTDT 421.
NTDT 451 Medical Nutrition Therapy II 3
Continuation of Medical Nutrition Therapy I. Pathophysiology, diet and disease relationships and diet therapy for diseases: renal, gastrointestinal, cancer, AIDS, inborn errors of metabolism. Critical care nutrition, institutional and home care, nutritional management of physiological stress and trauma.
PREREQ: NTDT1490

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: NTDT1400 and NTDT1321.

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: NTDT1322 and NTDT1440.
COREQ: NTDT1460.

NTDT 446 Independent Study 1-6

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: NTDT2700.

NTDT 550 Dietetics Practicum I 4 PF
Introduces supervised practice experiences for incorporation and application of skills, knowledge, and attitudes with special emphasis on current dietary issues facing the health professional in public health nutrition.
COREQ: NID1650
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 with special emphasis on current dietary issues facing the health professional.
PREREQ: NTDT1550.
COREQ: NID1651.
RESTRICTIONS: Open to dietetic internship students only.

NTDT 610 Fundamentals of Nutrition and Metabolism 3
Review of metabolic processes related to nutrition and current research related to macronutrient and micronutrient functions.
RESTRICTIONS: Undergraduate preparation in biochemistry, physiology and basic nutrition.

NTDT 611 Advanced Nutrition 3
Metabolism and its relation to human nutrition; current literature; methods and techniques of nutrition research.
PREREQ: NTDT1400 or NTDT1610.

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.

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: NTDT1400 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 concepts. Primarily 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: Junior-level 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: NTDT1301 or NTDT1400 or NTDT1401.

NTDT 645 Nutrition Education 3
Identification of objectives for nutrition education; selection and use of methods, materials and resources for different age levels; and integration of nutrition into the total health and consumer aspects of school, preschool and adult programs.
PREREQ: NTDT1200.

NTDT 650 Current Perspectives in Dietetics I 2
Introduces exploration of roles and responsibilities of today's dietician 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 dietician 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 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. 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: NTDT2700.
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
Assists new students in utilizing university resources, student services and technology. Interdisciplinary approach which promotes study habits and professionalism within the healthcare professions and introduces students to the roles of various healthcare professionals.

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 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: ENGL 110.
CORRQ: PSYC 201.
RESTRICTIONS: Open to nursing majors only.

NURS 222  PHARMACOLOGY 3
Focuses on the therapeutic and adverse biological, psychological and social reactions to pharmacological agents. Drug use and modification abuse, client teaching, lab data and current research are discussed. Nursing responsibilities and clinical applications are emphasized.
PREREQ: NURS 220.
CORRQ: NURS 220, NURS 240.
RESTRICTIONS: Open to nursing majors only.

NURS 230  FOUNDATIONS OF NURSING 3
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 will be discussed as individuals, members of families, and as parts of cultural and global communities. Clinical experiences in the laboratory and healthcare facilities provide opportunities to practice physical and health assessment skills and teaching/health promotion techniques.
PREREQ: BISC 207, CHEM 105, CHEM 106, NURS 220 and a course in anatomy.
CORRQ: IFST 201, NTD 1200, NURS 222 and NURS 240.
RESTRICTIONS: Open to nursing majors only.

NURS 240  SCIENTIFIC BASIS OF NURSING 5
Examines pathophysiological concepts and prototype diseases. Laboratory practice to provide practice of psychomotor skills.
PREREQ: BISC 207, CHEM 105, CHEM 106, NURS 220 and a course in anatomy.
CORRQ: BISC 276, BISC 300, NURS 222 and NURS 230.
RESTRICTIONS: Open to nursing majors only.

NURS 312  PATHOPHYSIOLOGY 3-4
Focuses on biological processes leading to alterations of body structure and functions emphasizing the identifications of etiology and pathogenesis of selected diseases.
PREREQ: BISC 276, BISC 300, IFST 201, NTD 1200, PSYC 201 and STAT 200.
RESTRICTIONS: Open to nursing majors only. Nursing majors must take three credits; BRN majors must take four credits.

NURS 314  PSYCHOPATHOLOGY 2-3
Delineates psychopathological processes across the life span. Emphasis on the etiology, manifestations and treatment options of selected psychopathological processes. Addresses current trends and issues in the mental health field.
RESTRICTIONS: Admission to BRN Program.

NURS 317  PRACTICUM II 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of adult clients with common and recurring health problems. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours.
RESTRICTIONS: Open to nursing majors only. Permission required by department.

NURS 318  PRACTICUM III 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of children with common and recurring health problems. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours.
RESTRICTIONS: Open to nursing majors only. Permission required by department.

NURS 319  PRACTICUM IV 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of adults with mental illness. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours.
RESTRICTIONS: Open to nursing majors only. Permission required by department.

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 foundations for practice within a pluralistic society. Provides 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 NURS 340 and NURS 342. Incorporates the practical application of evolving technologies with emphasis on nursing/client education. Introduces University and BRN program resources.
PREREQ: NURS 340 and NURS 342.

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: NURS 343.

NURS 345  CONCEPTUAL FOUNDATIONS FOR NURSING PRACTICE 3
Introduces conceptual foundations for practice within a pluralistic society. Provides 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: NURS 333.
RESTRICTIONS: Open to BRN majors only.

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 systems. Key elements include a health history, physical, and psychosocial assessment.
PREREQ: NURS 333, NURS 345.
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.

NURS 352  NURSING CARE OF ADULTS I 2
Selected concepts and theories related to restoring and maintaining optimal health of patients experiencing common acute and/or chronic health problems.
PREREQ: NURS 220, NURS 230, NURS 240 and NURS 222.
COREQ: NURS 353.
RESTRICTIONS: Open to nursing majors only.

NURS 353  CLINICAL APPLICATION OF ADULT NURSING CARE I 3
Clinical experiences in the hospital, community and laboratory which reinforce information presented in NURS 352.
PREREQ: NURS 222, NURS 230 and NURS 240.
COREQ: NURS 352.
RESTRICTIONS: Open to nursing majors only.

NURS 354  PSYCHOSOCIAL NURSING 2
Practices selected concepts and theories related to restoring and maintaining optimal health of patients experiencing psychosocial problems.
PREREQ: NURS 220, NURS 222, NURS 230 and NURS 240.
COREQ: NURS 355.
RESTRICTIONS: Open to nursing majors only.

NURS 355  CLINICAL APPLICATIONS: PSYCHOSOCIAL NURSING 3
Application experiences in the hospital, community and laboratory which reinforce the information presented in NURS 354.
PREREQ: NURS 220, NURS 222, NURS 230 and NURS 240.
COREQ: NURS 354.
RESTRICTIONS: Open to nursing majors only.

NURS 356  CHILDREN/FAMILIES NURSING CARE 2
Practices selected concepts and theories related to the nursing care of infants, children and adolescents and their families.
PREREQ: NURS 222, NURS 230 and NURS 240.
COREQ: NURS 357.
RESTRICTIONS: Open to nursing majors only.

NURS 357  CLINICAL APPLICATION: CHILDREN AND FAMILIES NURSING CARE 3
Application experiences in the hospital, community and laboratory which reinforce information presented in NURS 356.
PREREQ: NURS 222, NURS 230 and NURS 240.
COREQ: NURS 356.
RESTRICTIONS: Open to nursing majors only.
NURSING

NURS 358  CHILDREARING FAMILY NURSING CARE  2
Presents selected concepts and theories related to the nursing care of the childbearing family
PREREQ: NURS222, NURS320 and NURS420
RESTRICTIONS: Open to nursing majors only

NURS 359  CLINICAL APPLICATION: CHILDREARING FAMILY NURSING CARE  3
Application experiences in the hospital, community and laboratory which reinforce information presented in NURS358
PREREQ: NURS222, NURS420 and NURS430
COREQ: NURS335
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: NURS220, NURS222, NURS230 and NURS420
COREQ: NURS1AT200
 RESTRICTIONS: Open to nursing and health studies majors only.

NURS 405  INTRODUCTION TO NURSING RESEARCH  2-3
Introduction to nursing research methods basic to identification of researchable nursing problems and to evaluation of existing nursing research for consumerism
PREREQ: BRN major - NURS441
COREQ: Nursing major - NURS408, NURS417, NURS418 or NURS419
RESTRICTIONS: Nursing majors must take three credit hours; BRN majors must take two credit hours. Open to nursing majors only

NURS 408  RESTORATIVE NURSING PRACTICE II  4
Concepts and theories pertinent to promotion of optimal health of clients with selected and less common health problems
COREQ: NURS417; NURS418 or NURS419; and NURS420
RESTRICTIONS: Open to nursing majors only. Permission required by department

NURS 409  PROFESSIONALISM IN NURSING PRACTICE  2
Concepts, theories and issues that influence nurses' legal, ethical and professional responsibilities to nursing and to the public
PREREQ: NURS405; NURS408; NURS417; NURS418 or NURS419
COREQ: NURS420
RESTRICTIONS: Open to nursing majors only

NURS 411  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 417  PRACTICUM V  3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health of children with common and/or recurring health problems. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours
PREREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332 or NURS222
COREQ: NURS408; NURS417 or NURS419; and NURS405
RESTRICTIONS: Open to nursing majors only

NURS 418  PRACTICUM VI  3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health of children with common and/or recurring health problems. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours
PREREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332 or NURS222
COREQ: NURS408; NURS417 and NURS405
RESTRICTIONS: Open to nursing majors only

NURS 419  PRACTICUM VII  3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health of adults with mental illness. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours
PREREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332 or NURS222
COREQ: NURS408; NURS417 and NURS405
RESTRICTIONS: Open to nursing majors only

NURS 420  PRACTICUM VIII  6
Selected experiences for the exploration and application of the basic concepts and theories of nursing leadership and management that facilitate transition to the professional role of the nurse. Comprises 168 clinical hours
PREREQ: NURS405, NURS408, NURS417, and NURS418 or NURS419
COREQ: NURS409
RESTRICTIONS: Open to nursing majors only

NURS 433  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 441  LEARNING LABORATORY: HEALTH ASSESSMENT  1
Demonstrates and integrates physical and psychological assessment skills on selected clients in the laboratory setting. Incorporates the practical application of evolving technologies in nursing practice and administration. Includes orientation to BRN Role Practicum.
PREREQ: NURS446

NURS 442  COMMUNITY 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: NURS444

NURS 443  BRN ROLE PRACTICUM  3
A preceptorized clinical experience focused upon the integration of concepts learned in baccalaureate nursing education
PREREQ: NURS441, NURS442
RESTRICTIONS: NURS445 and NURS446 required as prerequisites or corequisites

NURS 445  NURSING RESEARCH APPLICATIONS  1
Demonstrates the practical application of technology in selected steps of the research process. Explores the process of research utilization as a mechanism to develop a research based nursing practice
PREREQ: NURS405, NURS441 and NURS442
RESTRICTIONS: NURS443 and NURS446 required as prerequisites or corequisites

NURS 450  SYNTHESIS 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 NURS443
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 adult patients with critical and/or complex healthcare problems
PREREQ: NURS220, NURS222, NURS230, NURS240, NURS352 and NURS533
COREQ: NURS453
RESTRICTIONS: Open to nursing majors only

NURS 453  CLINICAL APPLICATION OF ADULT NURSING CARE II  3
Application experiences in the hospital, community and laboratory which reinforce information presented in NURS452
PREREQ: NURS220, NURS222, NURS230, NURS240, NURS352 and NURS353
COREQ: NURS452
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: NURS455
RESTRICTIONS: Open to nursing majors only
NURS 455 CLINICAL APPLICATION: 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: NURS454.
RESTRICTIONS: Open to nursing majors only.
NURS 467 INDEPENDENT STUDY 1-6
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 610 CULTURAL 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 AND 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 804 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 HSA804.
RESTRICTIONS: Permission required from department.
NURS 810 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 EDUC655 required as prerequisites or corequisites.
NURS 816 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.
PREREQ: NURS820.
COREQ: NURS820.
RESTRICTIONS: Open to majors only. Permission required from department.
NURS 817 PRECEPTORSHIP 1
Focuses on clinical topics in primary care relevant to each practitioner concentration.
PREREQ: All required clinical courses except NURS827.
RESTRICTIONS: Open to nursing majors only. Permission of department required.
NURS 819 FINANCIAL MANAGEMENT IN HEALTH SERVICES ORGANIZATIONS 3
Provides the basic principles and concepts of effective management of budgets for healthcare entities. Includes analysis of the environment and departmental organization and their impact on healthcare.
May be cross-listed with HSA819.
RESTRICTIONS: Permission of department required.
NURS 820 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 821 ADVANCED PATHOPHYSIOLOGY 3
Presents the pathogenesis of common conditions affecting children and adults as a basis for clinical management.
RESTRICTIONS: Permission of department required.
NURS 822 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 823 MANAGEMENT OF WOMEN’S HEALTHCARE 3
Focuses on gynecological and reproductive primary healthcare. Emphasizes management of gynecologic health needs and the normal reproductive cycle.
PREREQ: NURS820 and NURS821.
RESTRICTIONS: NURS820 and NURS821 required as prerequisites or corequisites.
NURS 824 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.
PREREQ: NURS820 and NURS821.
RESTRICTIONS: NURS820 and NURS821 required as prerequisites or corequisites.
NURS 825 MANAGEMENT OF ADULT EPISODIC HEALTH NEEDS AND PROBLEMS 3
Focuses on delivery of primary care to adults and the elderly with acute episodic health problems. Emphasizes the clinical decision making necessary to serve as a foundation for planning primary healthcare services.
PREREQ: NURS820 and NURS821.
RESTRICTIONS: NURS820 and NURS821 required as prerequisites or corequisites.
NURS 826 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: NURS820 and NURS821.
RESTRICTIONS: NURS820 and NURS821 required as prerequisites or corequisites.
NURS 827 PRECEPTORSHIP II 3
Emphasizes clinical decision making in an interdisciplinary environment with the nurse practitioners as the principal provider of primary care.
RESTRICTIONS: NURS821 required as either a prerequisite or corequisite.
NURS 828 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 clinical courses except NURS827.
NURS 829 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: NURS823.
NURS 830 ADVANCED MANAGEMENT OF CHILDREN AND ADOLESCENT HEALTHCARE 3
Focuses on the delivery of primary health care to specific populations. Emphasizes special problems of the neonate and high risk children and adolescents.
PREREQ: NURS824.
NURS 831 COMPREHENSIVE ASSESSMENT OF OLDER PERSONS 3
Provides a conceptual foundation for geriatric/gerontological clinical nurse specialists and nurse practitioners. Involves assessing older adults and their families and assisting them with a continuum of health promotion, disease prevention and disease management care.
RESTRICTIONS: NURS804 and NURS821 required as either prerequisites or corequisites.
NURS 832 HEALTH PROMOTION AND DISEASE PREVENTION/MANAGEMENT FOR OLDER PERSONS 3
Builds on NURS831 by providing opportunities for students to gain knowledge and skills related to primary, secondary and tertiary prevention of disease and disabilities in older persons.
PREREQ: NURS831.
NURS 836 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 HSADS36.
RESTRICTIONS: NURS804 required as prerequisite or corequisite.

NURS 837 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 goal attainment with ethical constraints of healthcare. May be cross-listed with HSADS36.
RESTRICTIONS: NURS804 required as prerequisite or corequisite.

NURS 838 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 HSADS36.
RESTRICTIONS: NURS804 required as prerequisite or corequisite.

NURS 840 Cardiopulmonary Nursing I 3-4
Explores the scientific basis of prevention programs for cardiopulmonary problems as well as of therapy for newly diagnosed or acute problems. Emphasizes assessment and therapeutic intervention.
RESTRICTIONS: NURS804 and NURS821 required as prerequisites or corequisites.

NURS 841 Cardiopulmonary Nursing II 3-4
Focuses on theoretical and clinical investigations of cardiopulmonary nursing problems requiring long-term care or follow-up of adult clients in a variety of community settings. Emphasizes assessment, health maintenance and rehabilitation.
PREREQ: NURS840.

NURS 850 Nursing of Women and Newborns I 3-4
Explores the biopsychosocial needs of women and newborns. Emphasizes interventions by the advanced practice nurse to maintain or restore steady state in low risk clients.
RESTRICTIONS: NURS804 and NURS821 required as prerequisites or corequisites.

NURS 851 Nursing of Women and Newborns II 3-4
Explores the biopsychosocial needs of women and newborns. Emphasizes interventions by the advanced practice nurse to maintain or restore steady state in clients with highly complex healthcare needs.
PREREQ: NURS850.

NURS 854 Nursing of Children I 3-4
Explores the scientific basis for the routine healthcare guidance required by children and their families. Focuses primarily on the acutely ill child.
RESTRICTIONS: NURS804 and NURS821 required as prerequisites or corequisites.

NURS 855 Nursing of Children II 3-4
Explores the biopsychosocial needs of children with chronic conditions and their families. Emphasizes interventions of the advanced practice nurse to assist these children to attain, maintain or regain health.
PREREQ: NURS854.

NURS 860 Clinical Nurse Specialist Advanced Clinical Practice 2 PF
Provides the opportunity for students in the clinical nurse specialist concentration to enhance proficiency as clinical experts within their chosen specialty area.
PREREQ: NURS831, NURS840, NURS850, NURS854 or NURS871.
RESTRICTIONS: Open to majors only. Permission required from department.

NURS 864 Nursing Practicum 1-3
In conjunction with his/her 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 contact in real life settings. Requires 135 hours of on-site experience, which can be taken in one semester or divided over three semesters.
RESTRICTIONS: NURS836, NURS837, or NURS838 is required as a prerequisite or prerequisite.

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.
PREREQ: NURS810.

NURS 869 Master's Thesis 1-6

PHILOSOPHY

PHIL 100  PHILosophies of life  3
Survey of selected past and present philosophies that people strive to live by, typically including individualistic, group-oriented, religious and nonreligious positions

PHIL 101  GReat westErn philosophers  3
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.

PHIL 102  INTRODUCTION TO PHILOSOPHY  3
An examination of such central philosophical problems as ethics, theories of knowledge, the nature of reality, philosophy of religion and political philosophy

PHIL 103  CRITICAL THINKING  3
Emphasis on developing skill at logical criticism of arguments. Topics include informal fallacies, deceiving films and music interpretations, the role of definitions in reasoning, the importance of evidence and confirmation.

PHIL 104  MODERN RELIGIOUS ISSUES  3
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 myths.

PHIL 125  TOPICS: PHILOSOPHY IN POPULAR CULTURE  1-4
Philosophical ideas expressed in popular media such as science fiction or fantasy literature, film and music. Topics are variable.

PHIL 200  BUSINESS ETHICS  3
Ethical theory applied to moral problems in business. Corporate social responsibility, and ethical issues in advertising, personnel and investment.

PHIL 201  SOCIAL AND POLITICAL PHILOSOPHY  3
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

PHIL 202  CONTEMPORARY MORAL PROBLEMS  3
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.

PHIL 203  ETHICS  3
Study of moral value, moral obligation and moral virtue through comparison of notable schools of ethical theory, including utilitarianism, existentialism, Kantianism, classical Greek eudaimonism, pessimism and Thomism.

PHIL 204  WORLD RELIGIONS  3
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

PHIL 205  LOGIC  3
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.

PHIL 207  SCIENTIFIC REASONING  3
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.

PHIL 208  INTRODUCTION TO JEWISH PHILOSOPHY  3
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.

RESEARCH

PHIL 802  OPERATIONS RESEARCH APPLICATIONS  3
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: MATH530, STA1001 or MATH630

PHIL 806  RESEARCH TECHNIQUES AND PROCEDURES  3
See FREC606 for course description.

PHIL 810  INTERNATIONAL AGRICULTURAL TRADE SPECIAL TOPICS  3
See FREC810 for course description.

PHIL 827  ADVANCED PRODUCTION ECONOMICS  3
See FREC827 for course description.

PHIL 834  SEMINAR IN RESOURCE ECONOMICS  3
See FREC834 for course description.

PHIL 868  RESEARCH  1-6
Research

PHIL 869  MASTER'S THESIS  1-6
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.

RESTR: Not open to students who have been admitted to candidacy.

PHIL 896  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.

RESTR: Not open to students who have been admitted to candidacy.

PHIL 896  DOCTORAL DISSERTATION  1-12 PF
Research
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<td>Philosophy of Science</td>
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<td>PHIL 307</td>
<td>Black Thought and Philosophy</td>
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<td>PHIL 308</td>
<td>Topics in Jewish Theology</td>
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<td>PHIL 309</td>
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**PHILOSOPHY**

- PHIL 306 Philosophy of Science: A survey of central topics in the philosophy of science which may include the distinction between science (astronomy) and pseudo-science (astrology), the role of values in science, scientific realism, scientific reductionism, as well as the nature of scientific theories, explanations, and confirmation.
- PHIL 307 Black Thought and Philosophy: See BAMS307 for course description.
- PHIL 308 Topics in Jewish Theology: Critical evaluation of the theological views of major branches of Judaism on such topics as: the significance of Israel, the status of Jewish law, the meaning of Jewish ritual and the mission of the Jewish people.
- PHIL 309 Indian Religion and Philosophy: May be cross-listed with WSTS308.
- PHIL 311 Early Medieval Philosophy: Examines the attempt to synthesize Greek philosophy with biblical religion in the late classical and early medieval period. Covers Plotinus, Augustine, Anselm and Abelard among others, on topics including God, scepticism, evil, the happy life, universals and more.
- PHIL 312 Late Medieval Philosophy: The rediscovery of Aristotle by the Islamic philosophers (10th-12th centuries) through Alghazali (14th century) and includes Avicenna, Alfarabi, Averroes, Maestinius, Aquinas, and more. Topics include science and religion, divine command theory, talking about God, among others.
- PHIL 315 Metaphysics: Examination of central issues in metaphysics. Sample topics: universals and particulars, possibility and necessity, identity over time, free will, causality, and the philosophy of time.
- PHIL 316 Time Travel: Through philosophy applied to physics and science fiction, explores the connections of time travel to traditional philosophic issues concerning the nature of time, God, free will and personal identity.
- PHIL 317 American Philosophy: Classical American philosophers, including Emerson, Thoreau, Peirce, James and Dewey. Includes ethics, epistemology and social and political theory.
- PHIL 320 Theory of Knowledge: An examination of some central issues in epistemology: classical and contemporary analyses of empirical knowledge, the nature of justification and rationality, implications for science, religion and metaphysics.
- PHIL 321 Philosophy of Biology: Examines philosophical issues raised by the theory of evolution. Topics may include the challenge of scientific creationism, the units of selection problem, the debate about adaptationism, human sociobiology and evolutionary ethics.
- PHIL 322 Existentialism: Study of the origins and development of existential philosophy. Emphasis on the fundamental insight into the nature of man that separates the existentialists from the rest of the Western philosophical tradition. Sources include Pascal, Kierkegaard, Nietzsche and Sartre.
- PHIL 327 Race, Gender, Science: Critical examination of scientific research on and arguments for and against the biological reality of race, sex and gender. Analyzes social constructivism about such categories as well as constructivist claims about the nature and objectivity of science.
- PHIL 330 Philosophy of Mind: Coverage of central issues in the philosophy of mind including such topics as the relation between mind and body, the nature of thought, consciousness, perception, personal identity and the relation of cognitive psychology, neuroscience and computer science to the philosophy of mind.
- PHIL 340 Cross Cultural Environmental Ethics: Critical and global study of the ethics of human-environment relations as suggested by the science of ecology, Western philosophy, physical science, the world views of Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism, Native American traditions, African traditions, feminism and American law.
- PHIL 341 Ethics of Engineering Profession: Introduction to cases involving engineers' moral responsibilities; emphasis on making reasonable ethical choices.
- PHIL 344 Science and Religion: Examines the relationship between science and religion and focuses on: whether our current cosmological picture of the Big Bang allows for a Creator; the rationality of miracle-reports; whether the scientific image of humanity is compatible with a religious worldview; the biological evolution/creation debate.
- PHIL 345 Philosophy of History: Nature and limits of our knowledge of the past, categories of explanation used by historians and the aim of historical inquiry. Speculation about the "meaning" of history and the structure of historical process.
- PHIL 366 Independent Study: 1-6 credits.
- PHIL 389 Topics: Women and Health Issues: See WMS389 for course description.
- PHIL 390 Honors Colloquium: See ARSC390 for course description.
- PHIL 392 Honors Colloquium: May be cross-listed with WOMS392.
- PHIL 444 Medical Ethics: Seminar focuses on such topics as experimentation with human subjects, genetic engineering and the moral problems of health care.
- PHIL 448 Environmental Ethics: Ethical problems associated with environmental protection, local, national, and international relations to social and political movements. Seminar format.
- PHIL 454 Philosophy of Social Science: Critical examination of the central historical and contemporary questions about the concepts, methods, social structure and purposes of social science inquiry.
- PHIL 463 Ethical Theory: Justification of ethical beliefs, alternative criteria of moral rightfulness and the meaning of moral concepts.
- PHIL 466 Independent Study: 1-6 credits.
- PHIL 467 Philosophy of Technology: Philosophical reflections on working tools in the broadest sense; definitions, studies of processes, products and use; and ethical, cultural and political critiques. Seminar format.
- PHIL 468 Environmental Ethics: Environmental ethics associated with environmental protection, local, national, and international relations to social and political movements. Seminar format.
- PHIL 468 Research: 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: Overview of the principles of physics and their applications. Course is designed for beginners with no previous exposure to physics.
- PHYS 201 Physics 201: Overview of the principles of physics and their applications. Course is designed for beginners with no previous exposure to physics.
- PHYS 202 Physics 202: Overview of the principles of physics and their applications. Course is designed for beginners with no previous exposure to physics.
- SCEN 101 General Physics: Overview of the principles of physics and their applications. Course is designed for beginners with no previous exposure to physics.
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 content 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, camera lenses, 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 fission 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
Guided toward a general audience and focuses on topics such as finding black holes in space; the nature of space, time and black holes; the origins 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 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 undecorated 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, structures 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: MATH141
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 PHYS207 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: MATH142

PHYS 209 FUNDAMENTALS OF PHYSICS III
3
Final course in a sequence with PHYS207 and PHYS208 that provides an introduction to physics for those in the physical sciences and engineering. Emphasis is on waves and quantum physics. Material on waves will include the harmonic oscillator, mechanical and electromagnetic waves, and the basics of Fourier series. The quantum physics material will include the Bohr model, diffraction and interference of electrons, photoelectric effect, blackbody radiation, Compton scattering, and the Schrödinger equation.
PREREQ: PHYS208
COREQ: MATH143 suggested.

PHYS 245 INTRODUCTION TO ELECTRICITY AND ELECTRONICS
4
Fundamentals of electricity and magnetism specific to DC and AC circuit analysis, transient circuit behavior and routing machinery. Fundamentals of analog and digital electronics, with emphasis on applications in engineering, integrated circuits and operational amplifiers.
PREREQ: PHYS207
COREQ: MATH1243
RESTRICTIONS: Not for major credit.

PHYS 306 COMPUTATIONAL METHODS OF PHYSICS
3
Introduction to basic computational techniques in physics with application to a number of modern topics of current interest to physicists.
PREREQ: MATH1243
COREQ: MATH1242
RESTRICTIONS: Knowledge of a programming language is essential.

PHYS 309 PHYSICS OF THE TWELFTH 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: PHYS208
COREQ: MATH1243 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: MATH102.

PHYS 313 PHYSICAL OPTICS
4
A detailed treatment of optics 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: MATH1243.

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: MATH102.

PHYS 424 QUANTUM MECHANICS
3
Introduces quantum mechanical concepts by reviewing experiments which cannot be explained by classical physics. The Schrödinger 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 ENGR424.
PREREQ: PHYS209, MATH102 and MATH149.
PHYS 449 Introduction to Research 1-6
Undergraduate research on an assigned problem carried out under the supervision of the staff.

PHYS 466 Independent Study 1-3

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 course in a two-part sequence with PHYS604 which provides a detailed treatment of electrostatics and magnetostatics at the intermediate level. Topics include Maxwell's equations in the static limit, multipole expansions, capacitors and electrostatic energy, analytical and numerical solutions to boundary-value problems, dielectric and magnetic media, and steady currents.
PREREQ: PHYS202 or PHYS205; MATH302
COREQ: MATH303 suggested

PHYS 604 Electricity and Magnetism II 3
Second course in a two-part sequence with PHYS603 which provides a detailed treatment of electromagnetic theory at the intermediate level. Maxwell's equations are developed and applied to electromagnetic waves in vacuum, material media, and wave guides. Includes application to electromagnetic radiation and special relativity.
PREREQ: PHYS603

PHYS 607 Methods of Mathematical Physics 3
Mathematical subjects commonly employed in physics with examples taken from physics. Linear vector spaces, Fourier series, orthogonal function expansions and eigenvalue problems.
PREREQ: PHYS602 and MATH302

PHYS 608 Methods of Mathematical Physics 3
Mathematical subjects commonly employed in physics with examples taken from physics. Complex variables and asymptotic analysis.
PREREQ: PHYS607

PHYS 610 Quantum Mechanics 3
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 cross-listed with ELEG616.
PREREQ: MATH241 and PHYS209

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: MATH302 and PHYS419

PHYS 621 Fundamentals of Modern Physics 3
Comprehensive and critical discussion of the phenomenological bases of atomic, electronic, and nuclear physics and their assimilation into a wave mechanical view of the microscopic world.
PREREQ: MATH302

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: PHYS616 and PHYS621

PHYS 631 Acoustics 3
Vibrations of particles, strings and membranes; acoustic waves; radiation of sound; room acoustics; and acoustic measurements.
PREREQ: MATH302

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 H-R diagram; solar and stellar activity; binary stars; the phenomena of galactic and extragalactic astronomy.
PREREQ: MATH302 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: PHYS632 and MATH302

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: PHYS208 or equivalent

PHYS 664 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: PHYS608 and PHYS645 or equivalents

PHYS 803 Solid State Physics 3
Crystal structure; mechanical, thermodynamic, electrical, optical and magnetic properties of solids; imperfections in crystals.
PREREQ: PHYS624

PHYS 809 Electromagnetic Theory 3
Review of statics; Maxwell's equations, physical optics and wave guides.
May be cross-listed with ELEG809.
PREREQ: PHYS604

PHYS 810 Electromagnetic Theory 3
May be cross-listed with ELEG810.
PREREQ: PHYS604 and PHYS609

PHYS 811 Quantum Mechanics 3
Continuation of PHYS610 Approximation methods. Introductory scattering theory. Spin matrix formulation of quantum mechanics. Applications to atoms, molecules, nuclei and crystals.
PREREQ: PHYS607 and PHYS610
COREQ: PHYS608

PHYS 812 Quantum Mechanics 3
PREREQ: PHYS811

PHYS 813 Statistical Mechanics and Thermodynamics 3
May be cross-listed with ELEG813.
PREREQ: PHYS616

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: PHYS809

PHYS 817 Advanced Classical Dynamics 3
Theoretical treatment of classical dynamics.
PREREQ: PHYS620

PHYS 838 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 688</td>
<td>Research</td>
<td>1-9</td>
<td></td>
</tr>
<tr>
<td>PHYS 689</td>
<td>Master's Thesis</td>
<td>1-6</td>
<td></td>
</tr>
<tr>
<td>PHYS 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 coursework.</td>
</tr>
<tr>
<td></td>
<td>RESTRICTIONS: Not open to students who have been</td>
<td></td>
<td>admitted to candidacy.</td>
</tr>
<tr>
<td>PHYS 969</td>
<td>Doctoral Dissertation</td>
<td>1-12 PF</td>
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</tbody>
</table>

**PHYSICAL THERAPY**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>PHYT 466</td>
<td>Independent Study</td>
<td>1-6</td>
<td>The ethics, licensure laws and practice of physical therapy will be explored. The Guide to Physical Therapy Practice will be introduced and the importance to effective practice discussed.</td>
</tr>
<tr>
<td>PHYT 600</td>
<td>Physical Therapy as a Profession</td>
<td>1</td>
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<tr>
<td>PHYT 604</td>
<td>Functional Anatomy and Biomechanics</td>
<td>4</td>
<td>Provides an overview of methodological issues in the conduct of physical therapy research. Topics include scientific method, experimental design, statistical procedures and technical writing.</td>
</tr>
<tr>
<td>PHYT 605</td>
<td>Clinical Internship</td>
<td>1-9 PF</td>
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<tr>
<td>PHYT 606</td>
<td>Research</td>
<td>3</td>
<td></td>
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<tr>
<td>PHYT 608</td>
<td>Musculoskeletal Evaluation and Treatment</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PHYT 609</td>
<td>Neurophysiological Evaluation and Treatment</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHYT 610</td>
<td>Psychosocial Aspects of Disabilities</td>
<td>2</td>
<td>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.</td>
</tr>
<tr>
<td>PHYT 611</td>
<td>Clinical Management Practices</td>
<td>1</td>
<td>Discusses concepts of administration and issues in the management of hospital clinics, private practice and consultative ventures.</td>
</tr>
<tr>
<td>PHYT 613</td>
<td>Advanced Orthopedics</td>
<td>3 PF</td>
<td>Discusses various schools of orthopedic intervention.</td>
</tr>
<tr>
<td>PHYT 614</td>
<td>Sports Physical Therapy</td>
<td>3 PF</td>
<td>Analyzes the various competencies required in the practice of sports physical therapy. Clinical skill acquired.</td>
</tr>
<tr>
<td>PHYT 615</td>
<td>Advanced Neurotherapeutics</td>
<td>3</td>
<td>Discusses an integration of the various neurodevelopmental approaches to the treatment of the neurological patient.</td>
</tr>
<tr>
<td>PHYT 616</td>
<td>Pediatrics Seminar</td>
<td>3 PF</td>
<td>Discusses selected problems encountered by the pediatric population and the treatment and research basis of these problems.</td>
</tr>
<tr>
<td>PHYT 617</td>
<td>Patient Management II</td>
<td>3</td>
<td>Continuation of PHYT 616. Teaches the theory and skills necessary for the physical therapy management of patients commonly seen in rehabilitation settings.</td>
</tr>
<tr>
<td>PHYT 618</td>
<td>Life Span Development</td>
<td>3</td>
<td>A study of human development and aging from birth through death. Emphasis on motor, sensory and cognitive functions and dysfunction.</td>
</tr>
<tr>
<td>PHYT 619</td>
<td>Advanced Seminar</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PHYT 620</td>
<td>Educational Process in Community Health</td>
<td>1</td>
<td>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.</td>
</tr>
<tr>
<td>PHYT 621</td>
<td>Practice Clinic</td>
<td>3 PF</td>
<td>Student participation in faculty practice clinic teaching referrals for physical therapy. All students participate in the clinic at least one semester.</td>
</tr>
<tr>
<td>PHYT 622</td>
<td>Clinical Gross Anatomy</td>
<td>6</td>
<td>Emphasis on structural and functional aspects of regions of body under study by means of human cadaver, bones, surface anatomy, lectures, computer technology and demonstrations.</td>
</tr>
<tr>
<td>PHYT 623</td>
<td>Clinical Neurosciences</td>
<td>4</td>
<td>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.</td>
</tr>
<tr>
<td>PHYT 624</td>
<td>Basic Evaluation Techniques</td>
<td>2</td>
<td>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.</td>
</tr>
<tr>
<td>PHYT 625</td>
<td>Advanced Regional Anatomy</td>
<td>3 PF</td>
<td>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.</td>
</tr>
<tr>
<td>PHYT 630</td>
<td>Human Movement Control</td>
<td>3</td>
<td>Examines theoretical, methodological and empirical issues required for an understanding of the control and coordination of human movement. Readings and group discussion of the implication of issues raised in the literature. Development of a proposal to study an aspect of motor behavior.</td>
</tr>
<tr>
<td>PHYT 631</td>
<td>Physical Therapy in the Acute Care Environment</td>
<td>4</td>
<td>Presents diagnoses commonly seen in the acute care environment. The pathological, anatomical, evaluation, documentation and treatment considerations in managing these diagnoses are discussed.</td>
</tr>
<tr>
<td>PHYT 632</td>
<td>Applied Physiology</td>
<td>3</td>
<td>In-depth analysis of the physiological mechanisms of the cardio-pulmonary system. Lectures in normal and abnormal function of this system. Emphasis on cardiopulmonary testing and rehabilitation techniques including stress tests and pulmonary function tests.</td>
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PHYSICAL THERAPY

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<tr>
<td>PHYT 633</td>
<td>APPLIED PHYSIOLOGY II</td>
<td>3</td>
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<td></td>
<td>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.</td>
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<tr>
<td>PRE/REQ:</td>
<td>PHYT 631.</td>
<td></td>
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<tr>
<td>PHYT 634</td>
<td>PHYSICAL AGENTS AND ELECTROTHERAPY</td>
<td>4</td>
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<tr>
<td></td>
<td>Provides an understanding of the physiological basis for the use of physical agents and electrotreatment. Emphasis placed on patient evaluation and clinical applications of modalities used in physical therapy clinics.</td>
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<tr>
<td>PRE/REQ:</td>
<td>All previous physical therapy graduate courses.</td>
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<tr>
<td>PHYT 641</td>
<td>ROUNDS I</td>
<td>1 PF</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
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<td>Open to physical therapy graduate students only</td>
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<tr>
<td>PHYT 642</td>
<td>ROUNDS II</td>
<td>1 PF</td>
</tr>
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<td>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.</td>
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<tr>
<td>PHYT 643</td>
<td>ROUNDS III</td>
<td>1 PF</td>
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<td>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.</td>
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<tr>
<td>PHYT 644</td>
<td>ROUNDS IV</td>
<td>1 PF</td>
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<tr>
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<td>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.</td>
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<tr>
<td>PHYT 809</td>
<td>PSYCHOSOCIAL ASPECTS OF HEALTH AND DISEASE</td>
<td>4</td>
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<td></td>
<td>Discusses the psychosocial characteristics of patients and therapists that impact on the rehabilitation process. Death and dying, social implications of illness diagnosis and other topics are discussed.</td>
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<td>All prior physical therapy graduate courses.</td>
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<tr>
<td>PHYT 810</td>
<td>CLINICAL MANAGEMENT</td>
<td>3</td>
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<tr>
<td></td>
<td>Discusses concepts of administration and issues in the management of hospital clinics, private practice, and consulting ventures. Introduces students to current trends in billing and reimbursement strategies being used by clinics.</td>
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<tr>
<td>PRE/REQ:</td>
<td>All prior physical therapy graduate courses.</td>
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<tr>
<td>PHYT 811</td>
<td>PEDIATRICS</td>
<td>4</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>PRE/REQ:</td>
<td>All prior physical therapy graduate courses.</td>
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<tr>
<td>PHYT 812</td>
<td>PEDIATRIC INTEGRATED CLINICAL EXPERIENCE</td>
<td>1</td>
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<tr>
<td></td>
<td>Mentored clinical experience in pediatric healthcare facilities.</td>
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<td>All prior physical therapy graduate courses.</td>
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<tr>
<td>PHYT 821</td>
<td>ORTHOPEDIC INTEGRATED CLINICAL EXPERIENCE</td>
<td>3 PF</td>
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<tr>
<td></td>
<td>Mentored clinical experience in University of Delaware Physical Therapy Clinic. Emphasis on orthopedic surgery with some exposure to outpatients with other diagnoses. All students participate in this experience for one semester.</td>
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<td>All previous physical therapy graduate courses.</td>
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<tr>
<td>PHYT 822</td>
<td>GERIATRIC INTEGRATED CLINICAL EXPERIENCE</td>
<td>3 PF</td>
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<tr>
<td></td>
<td>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.</td>
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<td>PRE/REQ:</td>
<td>All previous physical therapy graduate courses.</td>
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<tr>
<td>PHYT 831</td>
<td>CLINICAL INTERNSHIP I: ACUTE CARE</td>
<td>3</td>
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<tr>
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<td>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.</td>
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<tr>
<td>PRE/REQ:</td>
<td>All previous physical therapy graduate courses.</td>
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<tr>
<td>PHYT 832</td>
<td>CLINICAL INTERNSHIP II: REHABILITATION</td>
<td>3</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>PRE/REQ:</td>
<td>All previous physical therapy graduate courses.</td>
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<tr>
<td>PHYT 886</td>
<td>RESEARCH</td>
<td>1-9</td>
</tr>
<tr>
<td>RESTRICTIONS:</td>
<td>Requires permission of instructor.</td>
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<tr>
<td>PHYT 869</td>
<td>MASTER'S THESIS</td>
<td>1-6</td>
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<td>RESTRICTIONS:</td>
<td>Requires permission of instructor.</td>
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PLANT AND SOIL SCIENCES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSC 100</td>
<td>PLANT AND HUMAN CULTURE</td>
<td>3</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>PLSC 101</td>
<td>BOTANY I</td>
<td>4</td>
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<td></td>
<td>Introductory botany stressing fundamental concepts and processes in plants. Topics include cell structure and function, anatomy, genetics, reproduction, physiology, taxonomy, phytology and ecology.</td>
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</tbody>
</table>
PLSC 105 INTRODUCTORY FORESTRY 3
DISTRIBUTION, ecology, value, measurement and management of forest systems.
PREREQ: PLSC 110

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 FAMINE 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 PLSC 401.

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 201 BOTANY II 4
Sexual and vegetative characters of algae, bacteria, fungi, liverworts, mosses, ferns, bryophytes, club mosses, quillworts, gymnosperms and angiosperms. Selected genera within these divisions considered in detail.
PREREQ: PLSC 101 or BISC 207.

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: CHEM 101.

PLSC 205 INTRODUCTION TO SOIL SCIENCE LABORATORY 1
Laboratory exercises in soil science.
PREREQ: PLSC 204.

PLSC 211 HERBACEOUS LANDSCAPE PLANTS 3
Survey of herbaceous plants including annuals, perennials and bulbs; plant identification, culture, selection, design and maintenance in the landscape.
PREREQ: PLSC 213.

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: PLSC 213.

PLSC 270 BIOTECHNOLOGY: SCIENCE AND SOCIOECONOMIC ISSUES 3
See ANSC 270 for course description.

PLSC 300 PRINCIPLES OF ANIMAL AND PLANT GENETICS 3
See ANSC 300 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: PLSC 201 or BISC 207.

PLSC 305 ENVIRONMENTAL SOIL MANAGEMENT 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: CHEM 102 and PLSC 204.

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: BISC 207, CHEM 103.

PLSC 310 ANIMAL AND PLANT GENETICS LABORATORY 1
See ANSC 310 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: PLSC 204.

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: PLSC 204 and CHEM 102.

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: PLSC 212.

PLSC 344 FOREST ECOLOGY 2
See ENVC 344 for course description.
PREREQ: BISC 208.

PLSC 364 LANDSCAPE HORTICULTURE INTERNSHIP 1-6
Supervised, faculty-monitored, career-related experience in one or more aspects of the ornamental horticulture industry.
PREREQ: PLSC 213.

PLSC 366 INDEPENDENT STUDY 1-6

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: PLSC 151.

PLSC 402 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: PLSC 201.

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: PLSC 101 or PLSC 151.

PLANT AND SOIL SCIENCES
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 mechanisms and regulation, water and salt 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, epiphytology, symptoms and control.
PREREQ: PLSC303.

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 nematocides and their use.
PREREQ: PLSC201.

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 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 420  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.
PREREQ: PLSC410.
COREQ: PLSC410.

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

PLSC 429  INTRODUCTORY MYCOLOGY  4
A survey of the structure, classification and possible relationship of major groups of fungi with stress on representative organisms and a working knowledge of terminology. Practical laboratory experience in the culture and identification of fungi.
RESTRICTIONS: Requires permission of instructor.

PLSC 435  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, PLSC306.

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: MATH221.

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 foci of discussion groups, student oral and written presentations, case studies, guest lectures and field trips.
RESTRICTIONS: Open to Junior and Senior majors only.

PLSC 461  SOILS AND WETLAND Delineation  3
Soil taxonomy, use of a soil survey, properties of hydric soils and wetland delineation using soil characteristics, hydrology and plant ecological principles.

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

PLSC 466  INDEPENDENT STUDY  1-6

PLSC 470  WHEED 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 501  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 502  PHYSIOLOGICAL PLANT PRODUCTIVITY  3
PREREQ: PLSC410.

PLSC 503  SOIL PHYSICS  3
See BREG003 for course description.

PLSC 505  PLANT BREEDING  3
Improvement of crops through the application of genetic principles to breeding methods.
RESTRICTIONS: Includes at least two mandatory Saturday field trips.

PLSC 506  SOIL GENESIS AND CLASSIFICATION  4
Soil forming factors and processes; chemical, physical and mineralogical parameters useful in characterizing soil; geologic and geomorphic settings in Delaware and their influence on soil formation and classification; soil taxonomy and soil limitations and interpretations.
PREREQ: PLSC204.

PLSC 507  PLANT AND SOIL WATER RELATIONS  3
Environmental aspects, measurement and control of water flux and storage in the soil-plant-atmosphere continuum; and development and significance of plant water deficits.
PREREQ: PLSC505 and PLSC410.

PLSC 508  ENVIRONMENTAL SOIL CHEMISTRY  3
Principles of soil chemical reactions and their application to the environmental including: inorganic and organic soil components, soil solution-solid phase equilibria, sorption phenomena, ion exchange reactions, kinetics of soil chemical processes, redox chemistry, soil acidity and salinity.
May be cross-listed with CHEM608
PREREQ: CHEM102 or CHEM104 and PLSC204.

PLSC 509  PLANT MICROTECHNIQUE  4
Introduction to techniques useful in microscopically examining diseased and non-diseased plant structures. Emphasis on fixation, embedding, sectioning, staining and interpretation of prepared materials.

PLSC 611  DIAGNOSTIC PLANT PATHOLOGY  3
Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epiphytology, symptoms and control.
PREREQ: PLSC303.

PLSC 613  PRINCIPLES OF PLANT DISEASE CONTROL  3
Exclusion, eradication, resistance and protection with emphasis on fungicides, bactericides and nematocides and their use.
PREREQ: PLSC303.
PLSC 614 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 615 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 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.

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

PLSC 629 INTRODUCTORY MYCOLOGY 4
Survey of the structure, classification and possible relationship of major groups of fungi with emphasis on representative organisms and a working knowledge of terminology. Practical laboratory experience in the culture and identification of fungi.
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 (phylogeny), nomenclature, policy statements and management concerns.
PREREQ: PLSC402.
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, PLSC306.

PLSC 640 INTEGRATED PEST AND DISEASE MANAGEMENT 3
See ENWC640 for course description.

PLSC 644 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 646 PLANT CELL BIOLOGY 3
See BISC646 for course description.
PREREQ: Introductory organic chemistry.

PLSC 650 CLAY MINERALOGY 3
See MASI650 for course description.

PLSC 655 POLLUTION MICROBIOLOGY 3
Integration of basic chemical, physical and biological processes that affect biotransformation 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
Role 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 WEED 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 current 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 BISC563.

PLSC 805 INSECT-PLANT CHEMICAL ECology 2
See ENWC605 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 CHEM419.
PREREQ: PLSC608, and either CHEM418 or CHEM443.

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: PLSC919.

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 3
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 botanical 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
PREREQ: PLSC204 and MA3122.

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 870 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.

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**PORTUGUESE**

**PORT 105** **BRAZILIAN PORTUGUESE I - ELEMENTARY** 4
Introduction to Brazilian Portuguese language and development of speaking, listening, reading and writing skills through the use of basic texts

**PORT 106** **BRAZILIAN PORTUGUESE II - ELEMENTARY/INTERMEDIATE** 4
Completion of basic Brazilian Portuguese. Increasing mastery of the basic skills of speaking, listening, reading and writing.
PREREQ: PORT 105
RESTRICTIONS: Two or three years of high school Brazilian Portuguese acceptable in lieu of Prerequisite.

**PORT 315** **INTENSIVE PORTUGUESE FOR SPANISH SPEAKERS** 3
Students with advanced knowledge of Spanish (300-level) will learn the basic structures and vocabulary of Portuguese in a concentrated course covering material of PORT 105 and PORT 106.
PREREQ: Any 300-level Spanish course, or graduate status in Spanish, or being a Heritage speaker of Spanish.

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

**POSC 202** **INTRODUCTION TO SCIENTIFIC INQUIRY** 3
Introduces students to the foundations of scientific social research, with emphasis on political phenomena. Prepares students in the skills needed to conduct scientific research.
RESTRICTIONS: Students cannot take both POSC202 and POSC300 for credit.

**POSC 211** **INTRODUCTION TO POLITICAL INTELLIGENCE 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 220** **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 260** **HUMANITIES COLLOQUIUM** 3
See ASRC260 for course description.

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

**POSC 285** **CURRENTS IN POLITICAL THEORY** 3
Basic introduction to political philosophy, organized not around particular historical periods or specific philosophers, but around some of the most important, 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 303** **PUBLIC ADMINISTRATION** 3
Introduction to management in the public sector; personnel, budgeting, leadership, ethics, and the role of civil service in government.

**POSC 306** **ECONOMIC THEORY 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 FLIT309
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. Considers 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 COMM319 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 an insight and understanding of race as an intricate part of 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** 3
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** 3
Examines various aspects of political behavior including political socialization, the formation of political attitudes and opinions, electoral behavior and political participation. Attention also given to the relationship of political behavior and public policy.

**POSC 329** **INTERNATIONAL MIGRATION** 3
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.
May be cross-listed with GEOG329, HIST329, and/or SOCI329.

**POSC 330** **POLITICAL TERRORISM** 3
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 Freshman except with consent of instructor.

**POSC 331** **PLANETARY MANAGEMENT SEMINAR AND LABORATORY** 3
See GEOG331 for course description.
POLITICAL SCIENCE

POSC 333  COMMUNISM, FASCISM AND DEMOCRACY  3
Ideology and environmental backgrounds Understanding of the operating nature and causes of the national aspects of the contemporary Western political life.

POSC 334  LIBERALISM AND CONSERVATISM  3
Introduces liberalism, socialism, liberalism, conservatism and democratic forms of Marxism: 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  3
Examines Britain's role in the integrated Europe, with focus on contemporary problems and prospects of closer British ties to the European Union and related bodies.

POSC 340  POLITICS AND THE MEDIA  3
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 for a democratic society.

May be cross-listed with COMJ340

POSC 341  ENVIRONMENT OF MULTINATIONAL CORPORATIONS  3
See BUAD341 for course description

POSC 343  SOCIETY, POLITICS AND HEALTHCARE  3
Interdisciplinary study of the political, 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 SOC1343

POSC 350  POLITICS AND THE ENVIRONMENT  3
The political context of environmental issues; air and water pollution, population control, and conservation.

POSC 355  URBAN POLITICS AND COMMUNITY DEVELOPMENT  3
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 356  HUMANITIES CONGRESS  3
See ASRC360 for course description

POSC 362  DIPLOMACY  3
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  3
Introduction to the development of international law and international organization.

POSC 366  INDEPENDENT STUDY  1-6
POSC 372  EAST CENTRAL EUROPEAN POLITICS  3
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  3
Development of the Arab-Israeli conflict analyzed from the Dreyfus Affair and the Balfour Declaration to current events.

POSC 380  INTRODUCTION TO LAW  3
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 LEGS380

POSC 387  AMERICAN POLITICAL THOUGHT  3
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  3
See ASRC390 for description.

May be cross-listed with GEOG390

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.

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 JWSI309.

Restrictions: May be repeated once when topics vary.

POSC 411  POLITICAL MARRIAGE  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-SOVIET 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.

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.

Restrictions: May be repeated for credit once when topics vary.

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
Explores 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 material 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 COMM425 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, globalisation, 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 nations. Comparisons of the actions and influence of the military, church, bureaucracies, political parties and guerrilla groups in three different Latin American settings: modern, transitional and traditional.

POSC 432  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, 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  POLICIES AND LITERATURE 3
Class, civil rights, feminism, revolution and other political issues examined through novels, film and other literary works.

POSC 437  WHO GOVERNS: PERSPECTIVES ON POLITICAL POWER 3
Rises 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
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 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.

RESTRICTIONS: Offered only in conjunction with travel abroad programs. May be repeated for credit when topics vary.

POSC 442  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 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.

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 U.S. foreign policies also examined and evaluated.

POSC 446  INTERNATIONAL HUMAN RIGHTS ON FILM 3
A study 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 nations.

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, interdependency, radical, neo-realist and post-structuralist perspectives.

POSC 450  PROBLEMS OF LATIN AMERICAN POLITICS 3
Current political issues in selected Latin American countries.

POSC 452  PROBLEMS IN URBAN POLITICS 3
Contemporary problems and political relationships in urban communities. May be cross-listed with FLLI436.

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 contexts of non-profit organizations. Discusses how non-profit organizations are structured and structured in the pursuit of their mission. Designed to prepare students for a career as an administrator in a non-profit organization.

POSC 458  COMMUNITY SERVICE FIELDWORK 3
A series of feature films and documentaries also highlights recent and current human rights violations in foreign nations.

POSC 463  THE UNITED NATIONS AND WORLD AFFAIRS 3
Explores the development, institutional structure, and prospects of the United Nations.

POSC 464  INTERNSHIP IN POLITICAL SCIENCE 1-6
Internship in a political science or international relations-related field. Includes preparation of 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

POSC 468  UNDERGRADUATE RESEARCH 1-6
Research conducted under the direction of or in conjunction with a faculty member. May result in a master’s thesis or be incorporated into a faculty project.

POSC 470  SENIOR HONORS SEMINAR 3

POSC 475  MODEL UNITED NATIONS 3
Intensive preparation for 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 3
Designed to integrate students' accrued knowledge and skills in Political Science. Emphasizes analytical, written, and oral communication skills.

RESTRICTIONS: Offered in conjunction with a 400-level POSC course.

POSC 604 INTERNATIONAL LAW 3
See MAS1673 for course description.

POSC 605 TOPICS IN LAW AND COURTS 3
Content of this 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 PROCESSES 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.

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 blocks, 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 3
See UAPP659 for course description.

POSC 678 COASTAL AND MARITIME LAW 3
See MAS1678 for course description.

POSC 679 SHIPPING AND PORT MANAGEMENT 3
See MAS1679 for course description.

POSC 680 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 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
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 UAPP803.

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 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 NORMATIVE ISSUES IN GLOBAL GOVERNANCE 3
Examines normative issues in contemporary global governance from the perspective of diverse ethical traditions and/or political philosophy.
**POSC 880** 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 810** 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** 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** Political Economy of the Environment 3
See UAPP810 for course description.

**POSC 815** 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** 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** Financing Alternatives in the Public Sector 3
See UAPP817 for course description.

**POSC 818** Environmental Policy and Administration 3
U.S. environmental policy and administration of air and water pollution control programs. Secondary consideration given to population control, energy and natural resource development and conservation, as well as intergovernmental relations in environmental program implementation. May be cross-listed with MAST871 and/or UAPP818.

**POSC 819** Management Decision Making in Public and Nonprofit Sectors 3
See UAPP819 for course description.

**POSC 820** International Perspectives on Energy & 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** Pre-seminar: Technology, Environment and Society 3
See UAPP821 for course description.

**POSC 825** Comparative Public Administration 3
A reading and discussion seminar concentrating on the development of administration 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** Taxation and Fiscal Policies 3
See UAPP829 for course description.

**POSC 830** Seminar: International Relations 3
Survey a 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** Organization and Management in Public and Nonprofit Sectors 3
See UAPP835 for course description.

**POSC 837** Human Resources Management in Public and Nonprofit Sectors 3
See UAPP837 for course description.

**POSC 838** 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** Financial Management in Public and Nonprofit Sectors 3
See UAPP839 for course description.

**POSC 840** 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 843** 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 868** Research 3
To be taken by M.A. students seeking to satisfy the program's research requirement through the research paper option.

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

**POSC 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.

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

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**PSYC 201** General Psychology 3
A foundation course in the application of the scientific method to problems of human behavior and experience.

**PSYC 270** Families and Developmental Disabilities 3
See IFS1270 for course description.

**PSYC 301** Personality 3
A survey of data and theories of human personality and affect. PREREQ: PSYC201.

**PSYC 303** Introduction to Social Psychology 3
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: PSYC201.

**PSYC 309** Measurement and Statistics 3
Theory and the application of statistical techniques to psychological data. PREREQ: One course in basic college mathematics and PSYC201.

**PSYC 310** Sensation and Perception 3
Theories and experimental study of sensation and perception. PREREQ: PSYC201 and PSYC309.

**PSYC 312** Learning and Motivation 3
Experimental study of contemporary theories of learning and motivation. PREREQ: PSYC201 and PSYC309.

**PSYC 314** Brain and Behavior 3
Study of the brain mechanisms underlying hunger, sex, aggression, learning, memory, perception, sleep and waking. May be cross-listed with COGSC314.

**PSYC 317** Sexual Behavior and Motive 3
An objective view of sex from physiological, psychological, sociological and anthropological studies. Readings include Masters and Johnson, Freud, Kinsey, Reiss, and Ford and Beach. Practical sexual information, e.g., contraception, also discussed, sometimes by outside experts. PREREQ: PSYC201 and PSYC309.
PSYC 324  INDUSTRIAL PSYCHOLOGY  3
Psychological factors in selection, training, fatigue, morale, attitudes, accidents, and other aspects of worker efficiency
PREREQ: PSYC201 and PSYC309

PSYC 325  CHILD PSYCHOLOGY  3
Survey of the interactions of physiological, psychological, and environmental factors determining psychological development. Consideration of major theories of child development
PREREQ: PSYC201 and PSYC309

PSYC 333  PSYCHOLOGY OF WOMEN  3
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 and the feminist perspective.
May be cross-listed with WOMS333.
PREREQ: PSYC201 and PSYC309

PSYC 334  ABNORMAL PSYCHOLOGY  3
Disorders of behavior and consciousness including the various psychoses, psychoneuroses, mental deficiency, and other conditions
PREREQ: PSYC201 and PSYC309.

PSYC 340  COGNITION  3
Survey of major themes in human thought processes, concept formation, problem solving, creativity, language use and cognitive development.
May be cross-listed with COSC340
PREREQ: PSYC201 and PSYC309

PSYC 346  PSYCHOLOGY AND THE LAW  3
See CRJU346 for course description.

PSYC 350  DEVELOPMENTAL PSYCHOLOGY  3
An analysis of theory and research in developmental psychology including the topics of developmental processes, developmental risk, systems theory and contemporary social issues
PREREQ: PSYC201 and PSYC309
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  3
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: PSYC201 and PSYC309

PSYC 366  INDEPENDENT STUDY  1-6

PSYC 370  RESEARCH IN PERSONALITY  3
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: PSYC201 and PSYC309
RESTRICTIONS: If both PSYC301 and PSYC370 are taken, only PSYC301 will count for major credit. Open to psychology majors and minors only

PSYC 380  PSYCHOPATHOLOGY  3
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 analysis of video-taped interviews with patients used to illustrate the disorders
PREREQ: PSYC201 and PSYC309
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  3
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 analysis
PREREQ: PSYC201 and PSYC309
RESTRICTIONS: If both PSYC303 and PSYC390 are taken, only PSYC303 will count for major credit. Open to psychology majors and minors only

PSYC 403  PSYCHOLOGY OF NONVERBAL BEHAVIOR  3
A seminar on the social psychological implications of the research literature on nonverbal behavior in social interaction. Focuses on interpersonal attraction, leadership, impression formation, causal attribution, deception, social attitudes and cross-cultural factors, with practical applications.
PREREQ: PSYC309

PSYC 404  EDUCATIONAL PSYCHOLOGY: COGNITIVE ASPECTS  3
See EDUC414 for course description.
RESTRICTIONS: Does not count toward the six credits of 400-level psychology courses required for the major.

PSYC 406  REDUCTION OF INTERGROUP CONFLICT  3
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: PSYC309

PSYC 407  EMOTIONS AND PREVENTIVE INTERVENTION  3
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
PREREQ: PSYC309.

PSYC 410  BIOLOGICAL BASIS OF MOTIVATION AND EMOTION  3
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 circadian rhythms, obesity and anorexia, sleep, fever, phobias, learned helplessness, voodoo death, fear, love and aggression.
PREREQ: PSYC201 and PSYC309

PSYC 413  EDUCATIONAL PSYCHOLOGY: SOCIAL ASPECTS  3
See EDUC413 for course description
RESTRICTIONS: Does not count toward the six credits of 400-level psychology courses required for the major.

PSYC 414  DRUGS AND THE BRAIN  3
Topics covered include drug treatment of mental illness, and drug abuse/addiction
PREREQ: PSYC309; PSYC 314

PSYC 415  HISTORY AND SYSTEMS OF PSYCHOLOGY  3
Psychology from the early Greeks through the more important "schools" of the 20th century
PREREQ: PSYC309

PSYC 416  PSYCHOLOGICAL PERSPECTIVES ON THE BLACK AMERICAN  3
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 cross-listed with BAM542.
PREREQ: PSYC309; and PSYC390 or PSYC393

PSYC 417  ANIMAL BEHAVIOR  3
Seminar on naturalistic and experimental investigations of species-typical behavior
PREREQ: PSYC309

PSYC 418  HUMAN EMOTIONS  3
Emotions, cognition and behavior: Role of emotions in personality and social relationships includes laboratory/tutorial sessions with analysis and presentation of scenes from dramatic literature to illustrate integration of emotion, cognition and action.
PREREQ: PSYC309

PSYC 424  APPLIED SOCIAL PSYCHOLOGY  3
The application of basic principles of interpersonal behavior to everyday life. Topics covered include persuasion, reciprocation, employee motivation, organizational development, liking and authority.
PREREQ: PSYC309

PSYC 425  FAMILY CONFLICT AND THE CHILD  3
Analysis of specific topic areas in child psychology, such as influence and cognitive and social development. Topics may vary from year to year.
PREREQ: PSYC309

PSYC 441  COMPUTERS AND COGNITION  3
Introduction to computer models of cognitive processes. Computer models gave rise to the interdisciplinary area of cognitive science. Course covers basic types of models that have been used and a discussion of their psychological plausibility.
May be cross-listed with COSC441
PREREQ: PSYC309

PSYC 443  TOPICS IN ORGANIZATIONAL COMMUNICATION  3
See COMM442 for course description.

PSYC 444  THE PSYCHOLOGY OF AESTHETICS  3
Psychological and psychobiological theories and empirical investigations of aesthetic experience
PREREQ: PSYC309

PSYC 445  TOPICS IN ADOLESCENT PSYCHOLOGY  3
Analysis of the physiological, psychological and social factors influencing psychological development from late childhood through adolescence
PREREQ: PSYC309

529
PSYC 460  ASSESSMENT OF YOUNG CHILDREN  3
See IFST452 for course description.

PSYC 462  LANGUAGE ACQUISITION  4
See EDUC462 for course description.

PSYC 466  INDEPENDENT STUDY  1-6

PSYC 468  RESEARCH  3-6

PSYC 481  CLINICAL PSYCHOLOGY  3
Introduction to clinical theories, research and practices. Diagnosis, classification and treatment of
behavior disorders
PREREQ: PSYC309
RESTRICTIONS: Open to psychology majors and minors only

PSYC 490  SOCIAL INTERDEPENDENCE  3
Presents theoretical and empirical approaches of social psychology to the study of
interpersonal interactions and the study of 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: PSYC309
RESTRICTIONS: Open to Junior and Senior psychology majors and minors only

PSYC 491  PSYCHOLOGY OF TEMPORAL ORIENTATION  3
The psychology of temporality is the scientific study of how temporal frames of reference
regarding the past, present and future affect a variety of basic human processes. The purpose of
this course is to learn more about these concepts and in the process, learn something about
human behavior.
PREREQ: PSYC309
RESTRICTIONS: Open to psychology majors and minors only.

PSYC 506  ANIMAL BEHAVIOR  3
Seminar on naturalistic and experimental investigations of species-typical behavior.
RESTRICTIONS: Requires permission of instructor

PSYC 512  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.
RESTRICTIONS: Requires permission of instructor

PSYC 526  NEUROSCIENCE I  4
See BISC526 for course description

PSYC 527  NEUROSCIENCE II  3
See BISC527 for course description

PSYC 630  NEURONS AND NETWORKS  3
Introduction to computational neuroscience: computing by real and artificial neurons and
networks and the modeling of brain function. Covers theoretical background and involves
hands-on projects to explore processing of sensory information, pattern discrimination, learning,
memory and the generation of movement.
May be cross-listed with CGSC630.
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 688  RESEARCH  1-6

PSYC 675  LANGUAGE ACQUISITION  4
See EDUC675 for course description.

PSYC 692  SOCIAL SKILLS TRAINING FOR CHILDREN  3
See EDUC692 for course description.

PSYC 804  SEMINAR: HUMAN DEVELOPMENT  3
Selected research literature in developmental psychology.
May be cross-listed with EDUC837.
RESTRICTIONS: Requires permission of instructor.

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
Theory and techniques of psychological classification, structured personality assessment, and
behavioral assessment. Administration, scoring and interpretation of the MMPI and other self
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 behavioral 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 psychodiagnostic; 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 EDUC813 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 868  RESEARCH  1-6
PREREQ: One 300-level Russian course

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

SCIENCE

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 Milford 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 EIE program.

SCEN 344 SCIENCE AND RELIGION 3
See PHIL 344 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: EDUC240 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.

SOCIOLGY

SOCI 201 INTRODUCTION TO SOCIOLGY 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.
SOCIOLOGY

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.

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.

SOCI 266 SPECIAL PROBLEM 1-3

SOCI 270 FAMILIES AND DEVELOPMENTAL DISABILITIES 3
See EFS2270 for course description.

SOCI 301 INTRODUCTION TO SOCIOLOGICAL RESEARCH 4
Survey of research methods and data analysis employed in sociology
PREREQ: SOCIO201 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: SOCIO201 or SOCIO209

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: SOCIO201 or SOCIO209

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: SOCIO201, SOCIO203 or PSYC201

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: SOCIO201 or SOCIO203 or SOCIO209

SOCI 311 SOCIOLOGY OF HEALTHCARE 3
Professionalization of health occupations, hospitals as social systems, medical education and practice organizations, healthcare organizations and their interrelationships (politics of health), and health service patterns.
May be cross-listed with CSCC311

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: SOCIO201

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, ideologies and dynamics, such as political consensus and cleavage. Attention given to particular methods of research in this specific area of social behavior.
PREREQ: SOCIO201 or SOCIO203 or PSYC201 or POSC150

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 CRJU322
PREREQ: SOCIO201

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: SOCIO201

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: SOCIO201

SOCI 326 EMERGENCY AND ENVIRONMENTAL MANAGEMENT PRACTICE AND SEMINAR 4 PF
Internship experience in an organization or agency responsible for emergency or environmental management. With approval of the area coordinator, the student is assigned to an organization to become familiar with issues, policies and practices pertaining to disasters. Student is under direct supervision of agency personnel while in the placement position. In addition to the hours spent in the organization, students are expected to meet weekly in a seminar with the area coordinator and other students to discuss issues and experiences.
PREREQ: SOCIO201 or SOCIO202, and SOCIO203
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: SOCIO201

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 POPULATION: 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 caused, 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 roles, legal and bureaucratic structures, and the impact of public policy on various welfare recipients. Emphasis on changes and issues of concern to students of social work.
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 perspectives. 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: SOCIO201 or SOCIO202 or PSYC201

SOCI 348 THEORIES OF SOCIAL WORK PRACTICE 3
Methods of social work practice, casework, group work, community organization; sociological and psychological foundations of underlying mental services.
PREREQ: SOCIO201
SOCIOLOGY

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: SOCID201

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 IWS1360

SOCI 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: SOCID201

SOCI 366  INDEPENDENT STUDY  1-3

SOCI 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

SOCI 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

SOCI 401  ADVANCED SOCIOLOGICAL METHODS  3
Conceptualization, design, data collection and data analysis in sociological research

SOCI 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: SOCID204.

SOCI 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: SOCID201, and either SOCID213 or WOMS201.
RESTRICTIONS: Restricted to junior and senior sociology and women's studies majors.

SOCI 410  HEALTH SERVICES PRACTICUM AND SEMINAR  4 PF
Field experience and related seminar. Placement in health service settings where students work for about 160 hours under supervision of health service administrators. Students meet in a weekly seminar with coordinator.
RESTRICTIONS: Requires permission of instructor

SOCI 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: SOCID301

SOCI 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: SOCID301.
RESTRICTIONS: Requires permission of instructor

SOCI 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

SOCI 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: SOCID312

SOCI 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: SOCID201

SOCI 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

SOCI 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.

SOCI 430  COMPARATIVE SOCIOLOGY  3
Examines the 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 IWS1430.
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

SOCI 435  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 IWS1435.
PREREQ: SOCID201

SOCI 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: SOCID341.
RESTRICTIONS: Requires permission of instructor

SOCI 442  LAW AND SOCIETY PRACTICUM AND SEMINAR  4 PF
Field experience and related seminar. Placement in court, law firm or other law-related institution where students work for approximately 160 hours under professionally trained supervisors; weekly seminar with program coordinator.
PREREQ: SOCID45.
RESTRICTIONS: Requires permission of instructor.

SOCI 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.

SOCI 450  POLITICAL SOCIOLOGY  3
Analysis of political organization and action, including evaluation of major approaches. Case studies of political structures and behavior.
PREREQ: SOCID201

SOCI 454  LAWYER'S ETHICS  3
An exploration of the ethical, moral and legal dilemmas that confront attorneys in the practice of law and how they attempt to resolve them.
May be cross-listed with CRJU454.
PREREQ: SOCID201 and three additional sociology courses.
RESTRICTIONS: Open to Junior and Senior sociology majors only.

SOCI 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: SOCID201 and three additional sociology courses.
SOCIOLOGY

SOCIO 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 GEOG460, JST460, and/or WOMS460

SOCIO 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.

SOCIO 470  ENVIRONMENTAL SOCIOLOGY  3
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.

SOCIO 496  PRACTICUM IN TEACHING  1-3 PF
Practical exposure to undergraduate education gained by assisting a member of the faculty in carefully supervised experiences such as discussion leader, crafting questions, consulting with students. Students may not be involved in the grading of student work or the assignment of grades. May be repeated for up to three credit hours.

SOCIO 605  DATA COLLECTION AND ANALYSIS  3
A survey of methods and techniques for defining research problems and for gathering and analyzing data in sociological research.

SOCIO 606  QUALITATIVE METHODOLOGY  3
Focuses on research design, the logic of inquiry and an elaboration of selected issues introduced in SOCI605. Special emphasis on epistemological issues, methodological concerns central to the social sciences and non-positivistic research strategies and techniques.

SOCIO 607  SOCIOLOGY OF GENDER  3
Reviews current research and theory in the sociology of gender with particular attention to issues arising from the gender division of labor, feminism and social change, gender and the structure of social institutions, and the interaction of gender, race, class and sexuality. Introduces sociological theory and methodology as used and revised by scholars working on gender issues.

SOCIO 608  GENDER, WORK AND FAMILIES  3
Brings together studies of the workplace and studies of the family with special focus on areas of overlap. Analysis of gender roles and the work/family overlap as well as focused discussion on issues of family policy.

SOCIO 611  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.

SOCIO 612  DEVELOPMENT OF SOCIOLOGICAL THEORY  3
Historical survey of the development of sociology and sociological theory beginning with the period of the Social Contract theorists through the classic European theorists of the 19th century.

SOCIO 614  ADVANCED DATA ANALYSIS  3
Methods of analyzing data in sociological research focusing on multivariate approaches.

SOCIO 621  THEORIES AND APPROACHES IN SOCIAL Deviance  3
General and specific theoretical orientations in the analysis of social deviance.

SOCIO 622  COLLECTIVE BEHAVIOR  3
Process and mechanisms operating in panics, riots, demonstrations and other disruptions of social order.

SOCIO 628  CORPORATE AND GOVERNMENTAL Deviance  3
Analyses and cases of internal organizational behavior when external efforts are made to have these behaviors treated as deviant. Also defenses used by the accused organizations, and precedences for, and consequences of, successfully labeling and sanctioning an organization as deviant.

SOCIO 637  LAW AND SOCIETY IN HISTORICAL PERSPECTIVE  3
Examination of the social history of law, crime and legal institutions in the United States from colonial times to present. Focus is on the role that law has historically played in allocating resources, structuring social relationships, and distributing political power.

SOCIO 655  LAW AND SOCIETY  3
Historical and structural development of legal systems. Emphasis on comparing legal systems in various cultures from Roman and Oriental law to Anglo-American legal systems.

SOCIO 658  SOCIAL SCIENCE, LAW AND THE LEGAL PROCESS  3
Examines the relationship between social science and law. Reviews the use of social science research to understand the operation and impact of law and the legal system. Critically examines the growing use of social science testimony by the courts.

SOCIO 661  RACIAL STRATIFICATION  3
Reviews the concept of race as a social historical category and examines the relationship of racial stratification to other systems of inequality. Also evaluates sociological theories of racial discrimination and institutionalized racism.

SOCIO 666  SPECIAL PROBLEM  1-12

SOCIO 813  CURRENT ISSUES IN SOCIAL THEORY  3
Deals with current controversies in social theory such as the public/private distinction, the development of symbolic interactionism and Neo-Marxism.

SOCIO 835  SEMINAR IN CRIMINAL AND DELINQUENT BEHAVIOR  3
A review of the basic issues in the sociological study of criminal behavior, including definition and measurement, and the relationship between age, gender, race, peers, family, class and economy and crime.

SOCIO 836  SEMINAR IN CRIMINAL AND DELINQUENT BEHAVIOR  3
An analysis of the major forms of criminal behavior such as violent crime, property crime, public order crime, organized crime, white collar crime and juvenile delinquency.

SPANISH

SPAN 101  ELEMENTARY SPANISH I  3
Introduction to the Spanish language and a development of speaking, listening, reading and writing skills through the use of basic texts.

SPAN 102  ELEMENTARY SPANISH II  3
Completion of basic Spanish.

SPAN 105  SPANISH I - ELEMENTARY  4
Introduction to the Spanish language and a development of speaking, listening, reading and writing skills through the use of basic texts.

SPAN 106  SPANISH II - ELEMENTARY/INTERMEDIATE  4
Completion of basic Spanish. Increasing mastery of the basic skills of speaking, listening, reading and writing.

SPAN 107  SPANISH III - INTERMEDIATE  4
Review of grammar, continued practice in speaking and writing, and reading texts of advanced difficulty.

SPAN 110  SPANISH IV - ADVANCED  4
Comparative study of the Romance languages.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
</table>
| SPAN 111    | Intermediate Spanish I | 3 | 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. |
| SPAN 112    | Intermediate Spanish II | 3 | Continued practice in speaking and writing, reading texts of average difficulty, grammar review as needed  
**PREREQ:** SPAN111  
**RESTRICTIONS:** Four years of high school Spanish acceptable in lieu of prerequisite. Satisfies College of Arts and Science language requirement. |
| SPAN 200    | Spanish Composition and Grammar | 3 | Intensive study of selected grammatical topics (subjunctive, ser-estar, pretérito and imperfecto). Vocabulary exercises and short compositions  
**PREREQ:** SPAN107 or SPAN112  
**RESTRICTIONS:** Prerequisites require a minimum grade of B. Not intended for native speakers. |
| SPAN 201    | Spanish Reading and Composition | 3 | Major emphasis on reading development, composition and literary analysis  
**PREREQ:** SPAN200 |
| SPAN 205    | Spanish Conversation | 3 | Practical use of Spanish by means of oral reports and discussions. Emphasis on improvement of basic conversational skills. Grammar review where appropriate, and/or written work  
**PREREQ:** SPAN107 or SPAN112, or one 200-level course  
**RESTRICTIONS:** Prerequisites require a minimum grade of B. Not intended for native speakers. |
| SPAN 206    | Culture through Conversation | 3 | 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. |
| SPAN 207    | Contemporary Latin America I | 3 | 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 Science language requirement. May be repeated for credit when taken on different study abroad programs. |
| SPAN 208    | Contemporary Spain I | 3 | 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 Science language requirement. |
| SPAN 254    | Latin America in the News | 3 | 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:** Any 200-level course taught in the Spanish language. |
| SPAN 255    | Spain in the News | 3 | 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:** Any 200-level course taught in the Spanish language. |
| SPAN 300    | Advanced Spanish Composition and Grammar I | 3 | Intensive study of basic and complex grammatical topics with both oral and written practice to facilitate mastery of vocabulary and structures  
**PREREQ:** SPAN200 and SPAN201 |
| SPAN 301    | Survey of Spanish Literature | 3 | Development of Spanish literature from its origins through the 17th century. Study of representative works, discussions and collateral readings.  
**PREREQ:** SPAN201. |
| SPAN 302    | Survey of Spanish Literature | 3 | Spanish literature from the 18th century to the present. Selection of representative works, discussions and collateral readings.  
**PREREQ:** SPAN201. |
| SPAN 303    | Survey of Spanish-American Literature | 3 | Representative works in all genres of Latin American literature from pre-Columbian to Modernism.  
**PREREQ:** SPAN201. |
| SPAN 304    | Survey of Spanish-American Literature | 3 | Representative works in all genres of Latin American literature in the 20th century.  
**PREREQ:** SPAN201. |
| SPAN 305    | Oral Communication | 3 | 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. |
| SPAN 306    | Practical Oral/Written Expression | 3 | Strengthens skills in grammar and vocabulary in preparation for advanced courses. Includes oral exposés, discussion of articles and videos, textual analysis and compositions  
**PREREQ:** Any two 200-level Spanish courses taught in Spanish.  
**RESTRICTIONS:** Taught abroad only. |
| SPAN 308    | Contemporary Spain II | 3 | 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. |
| SPAN 314    | Spanish Phonetics and Phonology | 3 | Study and practice of Spanish pronunciation and intonation. Contrasting analysis of Spanish and American English phonological systems. Introduction to Spanish dialectology  
**PREREQ:** SPAN200  
**RESTRICTIONS:** Recommended for prospective teachers. |
| SPAN 325    | Spanish Civilization and Culture | 3 | Survey of geography, history, art and society of Spain.  
**PREREQ:** SPAN200 |
| SPAN 326    | Latin American Civilization and Culture | 3 | Survey of geography, history, art and society of Latin American lands.  
**PREREQ:** SPAN200 |
| SPAN 352    | Introduction to Business Spanish | 3 | 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 students with basic policies and practices of the Hispanic business community. Includes writing, conversation, grammar and culture  
**PREREQ:** SPAN200 and SPAN201 |
| SPAN 355    | Special Topics | 3 | Explores an area of special interest in Spanish literature or culture studies. Subject matter varies and will be announced in the registration booklet.  
**PREREQ:** SPAN200  
**RESTRICTIONS:** May be repeated for credit when topics vary. |
| SPAN 366    | Independent Study | 1-3 |  |
| SPAN 370    | Studies in Spanish Literature Taught in Spain | 3 | 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 contexts. 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. |
| SPAN 401    | Advanced Spanish Grammar II | 3 | A systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises  
**PREREQ:** SPAN300 |
| SPAN 403    | History of the Spanish Language | 3 | History of the language from Latin to the present. Historical phonology and morphology  
**PREREQ:** Any 300-level Spanish course. |
| SPAN 406    | Advanced Spanish Language | 3 | 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. |
<table>
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<td>SPAN 415</td>
<td>Latin American Literature and Its Political Context</td>
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<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. PREQ: One SPAN300-level survey of literature.</td>
</tr>
<tr>
<td>SPAN 416</td>
<td>Cervantes: Don Quijote</td>
</tr>
<tr>
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<td>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 PREQ: One SPAN300-level survey of literature.</td>
</tr>
<tr>
<td>SPAN 417</td>
<td>Hispanic Nobel Prize Authors</td>
</tr>
<tr>
<td></td>
<td>Covers the works of Spanish and Latin American Nobel Prize authors - Echegaray, Benavente, Mistral, Ibarra, Antonio, Alzate, Neruda, Garcia Marquez, Paz and Cela - in relation to their cultural milieu on the regional, national and international levels and in relation to their authors' biographies PREQ: One SPAN300-level survey of literature.</td>
</tr>
<tr>
<td>SPAN 418</td>
<td>God, Man, and Woman</td>
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<td>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, Louis de Leon, Zayas and others. PREQ: One SPAN300-level survey of literature.</td>
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<td>SPAN 420</td>
<td>Topics: Medieval Literature</td>
</tr>
<tr>
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<td>Works of one or more authors of a special theme or genre within Spanish medieval literature Example: Love and Passion in the Middle Ages on the Iberian Peninsula PREQ: One SPAN300-level survey of literature.</td>
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<tr>
<td>SPAN 421</td>
<td>Spanish Medieval Literature</td>
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<tr>
<td></td>
<td>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. PREQ: One SPAN300-level survey of literature course.</td>
</tr>
<tr>
<td>SPAN 430</td>
<td>Latin American Novel and Cinema</td>
</tr>
<tr>
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<td>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 these novels illustrate artistic interpretations of the subject matter. PREQ: One SPAN300-level survey of literature.</td>
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<tr>
<td>SPAN 436</td>
<td>Topics: Literature of the Spanish Golden Age</td>
</tr>
<tr>
<td></td>
<td>Works of one or more authors or of a special theme or genre within Spanish literature of the Golden Age (16th and 17th centuries) PREQ: One SPAN300-level survey of literature course.</td>
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<tr>
<td>SPAN 439</td>
<td>Postwar Spanish Narrative</td>
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<td></td>
<td>The Spanish novel from 1962 to the present Focuses on novels by leading authors such as Luis Martin-Santos, Juan Goytisolo, Juan Benet, Carmen Maria Ingelejo, Ana Maria Mies and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism. PREQ: One SPAN300-level survey of literature.</td>
</tr>
<tr>
<td>SPAN 440</td>
<td>Topics: Eighteenth and Nineteenth Century Hispanic Literature</td>
</tr>
<tr>
<td></td>
<td>Works of one or more authors or of a special theme or genre within Hispanic literature of the 18th and 19th centuries. PREQ: One SPAN300-level survey of literature course.</td>
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<tr>
<td>SPAN 447</td>
<td>Contemporary Hispanic Fiction by Women</td>
</tr>
<tr>
<td></td>
<td>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. PREQ: One 300-level survey of Spanish literature course.</td>
</tr>
<tr>
<td>SPAN 450</td>
<td>Topics: Modern Hispanic Literature 1898-1936</td>
</tr>
<tr>
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<td>Works of one or more authors or of a special theme, genre, or topic within Hispanic literature from 1898 to 1936. PREQ: One SPAN300-level survey of literature course.</td>
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<tr>
<td>SPAN 451</td>
<td>Contemporary Spanish Poetry</td>
</tr>
<tr>
<td></td>
<td>Analysis of Spanish poetry from Becquer to the present day PREQ: One SPAN300-level survey of literature.</td>
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<tr>
<td>SPAN 452</td>
<td>Advanced Business Spanish</td>
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<td></td>
<td>Refines basic knowledge of Spanish business/commercial terminology by helping student realize the importance of cultural awareness in doing business in Hispanic countries or with Hispanics in the United States. PREQ: SPAN200 and SPAN201 SPAN300 and SPAN351 highly recommended.</td>
</tr>
<tr>
<td>SPAN 454</td>
<td>Introduction to Spanish Cinema</td>
</tr>
<tr>
<td></td>
<td>Study of modern Spanish cultural history through the films of each masters as Bardem, Saura, Bunuel, Almodovar, Berlanga, Miro, Amenabar, Medem, Paris, Fejerman, etc. Relation of these films to Spanish culture, politics, history, and to European film theory and analysis. PREQ: Any two 300-level Spanish literature courses.</td>
</tr>
<tr>
<td>SPAN 455</td>
<td>Selected Authors, Works, and Themes</td>
</tr>
<tr>
<td></td>
<td>Works of one or more outstanding authors or on a special theme PREQ: One 300-level Spanish literature course.</td>
</tr>
<tr>
<td>SPAN 460</td>
<td>Topics: Contemporary Hispanic Literature 1936-Present</td>
</tr>
<tr>
<td></td>
<td>Works of one or more authors or of a special theme, genre, or topic within Hispanic literature from 1936 to the present. PREQ: One SPAN300-level survey of literature course.</td>
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<tr>
<td>SPAN 462</td>
<td>Topics: Hispanic Short Fiction</td>
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<tr>
<td></td>
<td>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. PREQ: One SPAN300-level survey of literature course.</td>
</tr>
<tr>
<td>SPAN 464</td>
<td>Contemporary Spanish American Literature by Women</td>
</tr>
<tr>
<td></td>
<td>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 context. PREQ: One SPAN300-level survey of literature course.</td>
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<td>SPAN 466</td>
<td>Independent Study</td>
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<td>1-3</td>
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<tr>
<td>SPAN 475</td>
<td>Topics: Hispanic Culture and Civilization</td>
</tr>
<tr>
<td></td>
<td>Study of topics in Hispanic culture and civilization, ranging through the geography, history, art and society of Spain and Latin American countries. PREQ: Either SPAN352 or SPAN356.</td>
</tr>
<tr>
<td>SPAN 484</td>
<td>Contemporary Spanish Theatre</td>
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<tr>
<td></td>
<td>19th century Spanish theatre as a reflection of and commentary on society. Principal authors: Garcia Lorca, Buero Vallejo and Sastre. PREQ: One SPAN300-level survey of literature.</td>
</tr>
<tr>
<td>SPAN 501</td>
<td>Advanced Spanish Grammar</td>
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<tr>
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<td>Systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises.</td>
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<tr>
<td>SPAN 503</td>
<td>History of the Spanish Language</td>
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<td>History of the language from Latin to the present. Historical phonology and morphology.</td>
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<td>SPAN 515</td>
<td>Latin American Literature and Its Political Context</td>
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<td>SPAN 619</td>
<td>Topics: Medieval Literature</td>
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<td>In-depth analysis of selected works by contemporary Latin American authors, focusing on techniques used by these writers to reveal the political upheaval that has affected Latin America in recent years.</td>
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<td>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.</td>
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<td>SPAN 620</td>
<td>Topics: Medieval Literature</td>
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<td>Works of one or more authors or of a special theme, genre, or topic within Spanish medieval literature Example: Love and Passion in the Middle Ages on the Iberian Peninsula. PREQ: Open to graduate students only.</td>
</tr>
<tr>
<td>SPAN 621</td>
<td>Spanish Medieval Literature</td>
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<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>
STATISTICS

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 novels 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 or 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 Martín-Santos, Juan Goytisolo, Juan Benet, Carmen Martín Gaite, Ana María Moix and Esther Tusquets. Analysis of these works is grounded in international literary theory and criticism.

SPAN 640 TOPICS: EIGHTEENTH AND NINETEENTH CENTURY SPANISH LITERATURE 3
Works of one or more authors or of a special theme or genre within Hispanic literature of the 18th and 19th centuries.

SPAN 647 CONTEMPORARY HISPANIC FICTION BY WOMEN 3
Explores the rise of women in Spain and Spanish America. Analyzes selected works as individual literary creations, and also to situate 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 or 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 stylistics.

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 or 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 historical, 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 665 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 668 CONTEMPORARY SPANISH THEATRE 3
Twentieth-century Spanish theatre as a reflection of and commentary on society. Principal authors: Garcia Lorca, Rero Velarde 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. Emphasis on preparation of seminar presentations and term papers.

RESTRICTIONS: May be repeated for credit when topics vary.

STATISTICS

STAT 200 BASIC STATISTICAL PRACTICE 3
Uses real data from a variety of disciplines to explore topics in data analysis, estimation and inference such as graphical displays, estimation of and hypothesis tests on means and proportions, sampling distributions, confidence intervals, analysis of variance, simple linear regression, chi-square tests for independence.

PREREQ: College algebra.

STAT 266 SPECIAL PROBLEM 1-3

STAT 366 INDEPENDENT STUDY 1-6

STAT 370 INTRODUCTION TO STATISTICAL ANALYSIS 3
Basic probability, continuous, discrete and joint distributions; distribution of functions of random variables; order statistics; expected value and central limit theorem.

PREREQ: MATH122 or MATH224.

STAT 371 INTRODUCTION TO STATISTICAL ANALYSIS II 3
Distributions of common statistics, sampling techniques, estimation, confidence intervals, hypotheses testing and selected topics.

PREREQ: STA1370.

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: STA1371.

STAT 420 DATA ANALYSIS AND NONPARAMETRIC STATISTICS 3
Techniques of exploratory and graphical data analysis for univariate and multivariate data sets, and numerical and categorical variables. Emphasis on selection of proper procedure. Non-parametric techniques of estimation testing and curve smoothing.

PREREQ: STA1371.

STAT 466 INDEPENDENT STUDY 1-6

STAT 475 STATISTICS FOR ENVIRONMENTAL SCIENCE 3
Introduction to statistical methods for analyzing environmental data. Relevant probability and sampling theory is introduced, as well as procedures for summarizing, modeling and estimating and making inferences from environmental data, especially data distributed over space and/or time. A computer-based statistical package is used to explore behavior of different statistical techniques with a variety of environmental data sets.

May be cross-listed with GEOG475.

PREREQ: MATH243 and GEOG250.

RESTRICTIONS: If STA1475 is taken, degree credit cannot be given for any of the following courses: MA1H350, 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: STA1601.

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 MATH249.

STAT 608 STATISTICAL RESEARCH METHODS 3
See FREQ608 for course description.

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 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: STA1371.

STAT 616 DESIGN AND ANALYSIS OF EXPERIMENTS 3
Planning of experiments, designs for specific problems, fractional factorials, quasi-factorial experiments, balanced and unbalanced designs, confounding, introduction to linear estimation.

PREREQ: STA1615.

STAT 617 MULTIVARIATE METHODS 3
Multivariate analysis of variance and covariance; classification and discrimination; canonical correlation; principal components; factor analysis.

PREREQ: STA1371. 537
STAT 618 SAMPLING TECHNIQUES 3
Simple random sampling; stratified random sampling; ratio estimates; regression estimates; systematic sampling; cluster sampling; double sampling
PREREQ: STAT371

STAT 620 NONPARAMETRIC STATISTICS 3
Statistical procedures valid under unrestricterive 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 635 STATISTICAL QUALITY CONTROL 3
Process variation, sequence plotting, control charts, cumulative sum process control procedures; process capability studies, acceptance sampling, quality management and organization, and troubleshooting 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 cross-listed with GEOG657.
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 PREC674 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 816 LINEAR STATISTICAL INFERENCE II 3
Topics from general linear hypotheses of full rank and not full rank.
PREREQ: STAT815

STAT 818 MULTIVARIATE ANALYSIS 3
Likelihood estimation, vector random variables, Hotelling’s T-squared distribution of correlation coefficients, classification and discrimination, distribution of sample covariance matrix and generalized variance, and testing multiple hypotheses
PREREQ: STAT800

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 used in time domain. 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 832 TOPICS IN DATA ANALYSIS 3
Topics: graphical analysis; model evaluation, robust procedures; influence functions; multidimensional data plots, residual analysis; Bayesian concepts in data analysis

STAT 836 RESPONSE SURFACE METHODOLOGY 3
Derivation of nonlinear relationships between variables. Techniques for characterization and interpreting multidimensional systems through canonical and ridge analysis. Correlation analysis through eigenvalues and eigenvectors for linear systems.
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 Department.

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.

THEA 106 THE THEATRICAL EXPERIENCE ABROAD 3
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: Taught abroad.

THEA 200 INTRODUCTION TO THEATRE PRODUCTION 3
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.

THEA 202 INTRODUCTION TO THEATRE DESIGN 3
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.

THEA 203 INTRODUCTION TO COSTUMING 3
Explores the evolution of costume design and technology. Discusses and analyzes all aspects of costuming through reading of plays.

THEA 204 INTRODUCTION TO SPEECH AND SCENE 3
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.

THEA 206 INTRODUCTION TO DANCE 3
Examines the function and impact of dance in the lives of individuals, societies, and cultures. Lecture and participatory format.

THEA 207 TECHNICAL PRODUCTION PRACTICUM 1-4
Laboratory course for the production of scenery, properties, lighting and sound for public performances of the Professional Theatre Training Program Productions.
THEA 209  COSTUME PRODUCTION PRACTICUM  1-4  
Laboratory course for the production of costumes and costume crafts for public performances of the Professional Theatre Training Program Productions.

THEA 226  FUNDAMENTALS OF ACTING  3  
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.

THEA 236  FUNDAMENTALS OF JAZZ DANCE  3  
Jazz Dance as an art form and vehicle for individual and group expression. Emphasis on rhythm and style.

RESTRICTIONS: Previous dance experience recommended.

THEA 300  FUNDAMENTALS OF STAGECRAFT  3  
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.
PREREQ: THEA200 or THEA202.

THEA 301  FUNDAMENTALS OF PROPERTIES CONSTRUCTION  3  
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.
PREREQ: THEA200 or THEA202.

THEA 302  FUNDAMENTALS OF STAGE LIGHTING  3  
Introduces basic techniques and processes used in the lighting of theatrical productions. Emphasis on the use and manipulation of lighting equipment. Demonstrates equipment and basic techniques and processes through a combination of classroom lecture and laboratory experience.
PREREQ: THEA200 or THEA202.

THEA 303  FUNDAMENTALS OF SCENE PAINTING  3  
Introduces 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.
PREREQ: THEA200 or THEA202.

THEA 304  FUNDAMENTALS OF AUDIO FOR THE THEATRE  3  
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.
PREREQ: THEA200 or THEA202.

THEA 305  FUNDAMENTALS OF COSTUME CONSTRUCTION FOR THE STAGE  3  
Introduces basic costume construction techniques through lectures, demonstrations, and laboratory experience. Culminates in the construction of a finished costume.
PREREQ: THEA203.

THEA 306  FUNDAMENTALS OF PATTERNMAKING FOR THE STAGE  3  
Teaches basic patternmaking techniques required in costing through lectures, demonstrations, and laboratory experience. Includes how to recreate historical details used for period theatrical garments.
PREREQ: THEA203.

THEA 307  FUNDAMENTALS OF DRAPING FOR THE STAGE  3  
Teaches basic draping skills and applies them to period costumes. Examines several historical periods commonly used in theatrical productions. Students create muslins or finished garments from at least four historical periods.
PREREQ: THEA203.

THEA 308  FUNDAMENTALS OF COSTUME CRAFTS  3  
Provides basic experience in several crafts-related areas commonly utilized in costume making, including maskmaking, surface design, hatmaking, leather work and thermoplastics.
PREREQ: THEA203.

THEA 309  FUNDAMENTALS OF STAGE MANAGEMENT  3  
Study of the techniques and procedures used in managing theatrical productions from conception through performance.
PREREQ: THEA200 or THEA202.

THEA 310  FUNDAMENTALS OF MASKMAKING  3  
Class will include casting, sculpting human and animal features, and will explore various methods and materials for constructing theatrical masks. Students will construct three to four masks.
PREREQ: THEA203.

THEA 311  FUNDAMENTALS OF SCENE DESIGN  3  
Introduction to the exploration of conceptual and visual principles underlying the practice of scene design. Explores elements 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.
PREREQ: THEA200, or THEA202, or permission of instructor.

THEA 341  THEATRE/DRAMA: CLASSIC/MEDIEVAL  3  
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 CMLT341.

THEA 342  THEATRE/DRAMA: RENAISSANCE TO 1700  3  
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 CMLT342.

THEA 343  THEATRE/DRAMA: 1700 TO 1900  3  
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 CMLT343.

THEA 345  HISTORY OF THEATRE: AMERICAN MUSICAL THEATRE  3  
See MUSC345 for course description.

THEA 347  SPECIAL TOPICS IN THEATRE HISTORY  3  
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.

THEA 360  FUNDAMENTALS OF ORAL INTERPRETATION  3  
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.

THEA 366  INDEPENDENT STUDY  1-6  
Students assigned production responsibilities on departmental productions in the areas of lighting, sound, scenery, properties, costuming, 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 dramatical plot, locale and practice. Survey of function and role of the dramaturge 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: THEA104.

THEA 426  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 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 IA 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 IB 1
Continuation of THEA602.
PREREQ: THEA602.

THEA 604 Voice Development IIA 1
Continuation of THEA603, with an emphasis on range extension and the development of greater variety in expressiveness.
PREREQ: THEA603.

THEA 605 Voice Development IIB 1
Continuation of THEA604.
PREREQ: THEA604.

THEA 606 Voice Development IIIA 1
Individual instruction to identify habitual vocal patterns and to strengthen individual weaknesses in voice.
PREREQ: THEA605.

THEA 607 Voice Development IIIIB 1
Continuation of THEA606.
PREREQ: THEA606.

THEA 608 Stage Movement IA 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 IB 1
Continuation of THEA608.
PREREQ: THEA608.

THEA 610 Stage Movement IIA 1
Continuation of THEA609, with an emphasis on stage combat, tumbling, circus and other advanced movement techniques.
PREREQ: THEA609.

THEA 611 Stage Movement IIB 1
Continuation of THEA610.
PREREQ: THEA610.

THEA 612 Stage Movement IIIA 1
Individual instruction to identify habitual movement patterns and to strengthen individual weaknesses in stage movement.
PREREQ: THEA611.

THEA 613 Stage Movement IIIIB 1
Continuation of THEA612.
PREREQ: THEA612.

THEA 614 Stage Speech IA 2
Ear training and phonetics. Corrective work on regional speech habits.
RESTRICTIONS: Requires enrollment in the Professional Theatre Program/Acting or Directing.

THEA 615 Stage Speech IB 2
Continuation of THEA614. Beginning work on verse scansion.
PREREQ: THEA614.

THEA 616 Stage Speech IIA 1
Continuation of THEA615 with an emphasis on phrasing and verse scansion.
PREREQ: THEA615.

THEA 617 Stage Speech IIB 1
Continuation of THEA616.
PREREQ: THEA616.

THEA 618 Stage Speech IIIA 1
Stage dialects and advanced work in phrasing and verse scansion. Individual tutoring in problem areas.
PREREQ: THEA617.

THEA 619 Stage Speech IIIIB 1
Continuation of THEA618.
PREREQ: THEA618.

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 A 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 IIB 1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA633.

THEA 635 Stage Management Organizational and Managerial Techniques IIIA 1-2
Development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA634.

THEA 636 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: THEA635.

THEA 638 Stage Management Organizational and Managerial Techniques IIA 1-2
Development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA637.

THEA 639 Stage Management Production Skills I A 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 IIB 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 IIIA 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 costume’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: MEALWORKING 1
Materials, tools and methods of working with metal for scenery construction.
PREREQ: THEA 674

THEA 677 PROPERTIES PRODUCTION II 1
Tools, materials and methods for upholstery and drapery, casting, mold-making, and other properties techniques.
PREREQ: THEA 675

THEA 679 SCENERY: STAGE RIGGING 1
Tools, hardware and methods of rigging scenery. Emphasis on standard theatre rigging systems.
PREREQ: THEA 674

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: THEA 680

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: THEA 686

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 include (but are not limited to): Master Carpenter, Master Electrician, Property Master, Audio Engineer, Scenic Artist and Technical Director.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production. 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.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. 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. Students select topics from a list offered by PTP production faculty.
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 3
Examines the complex ways in which the concepts of community analysis and development are used and understood. Students connect the concepts to issues, problems or policy alternatives affecting local communities by participating in applied projects.
May be cross-listed with IFS1607.

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 IFS1608.

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 FINC611.

UAPP 612 URBAN HOUSING POLICY AND ADMINISTRATION 3
Focuses on housing policy at the urban level. Examines the role of government in housing and urban development. Explores the impacts of housing policies on social, economic, and environmental outcomes. Covers topics such as housing finance, housing affordability, and housing policy mechanisms.

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 analysis of urban transport systems with 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 EFFECTIVELY MANAGING VOLUNTEERS 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 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 depletion, energy and 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 1
Brings recognized scholars and leaders in urban affairs together with students. Provides an opportunity for wide-ranging discussion of current policy and research issues concerning communities and their citizens related to development, planning, democratic practice, social equity and governance in multiple contexts.

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.

UAPP 622 RESOURCES, DEVELOPMENT AND THE ENVIRONMENT 3
See GEOG622 for course description.

UAPP 623 INDEPENDENT STUDY IN GEOGRAPHICAL INFORMATION SYSTEMS (GIS) 3
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 correctional 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, and the course will go into substantial depth. Topics will include environmental impacts, utility programs, and international comparisons.
May be cross-listed with MAST622 and/or POSC626.
PREREQ: UAPP625 and POSC624.

UAPP 627 COMPARATIVE ENVIRONMENTAL POLITICS 3
Examines the impact 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 MAS1628 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, legal and legislative basis of preservation programs, with particular attention to National Register of Historic Places.
May be cross-listed with ARTH628, HIST6152, and/or MSTS629.

UAPP 630 METHODS IN HISTORIC PRESERVATION 3
Upper-level field research seminar concentrating on developing graphic, photographic and narrative skills for architectural documentation. Includes classroom and field sessions.
May be cross-listed with ARTH634 and/or HIST634.

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 seminars 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 a 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 archaeological 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 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 634 HOUSING FINANCE AND DEVELOPMENT 3
Fundamentals of real estate and housing finance. Various methods available to finance the development of real estate. Financial instruments 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, FHLB and FHLBM.

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 industrialism and capitalism, technology, gender and ethnicity, housing, poverty and wealth as a 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 data-base techniques.
May be cross-listed with ARTH622, GEOG636, and/or HIST636.

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 642 STRATEGIC PLANNING FOR PUBLIC AND NONPROFIT ORGANIZATIONS 3
Provides students with 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 645 PUBLIC SECTOR LABOR RELATIONS 3
An overview of employee-employee relations in state and local governments. Emphasis on the economic and political environment, institutional responses to collective bargaining, and economic and political outcomes of the bargaining process. Some emphasis on development of skills in grievance handling and arbitration.

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 LEST646.

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 LEST649.

UAPP 653 POLITICS AND HEALTHCARE 3
See POSC653 for course description

UAPP 654 VERNACULAR ARCHITECTURE 3
See HIST654 for course description.

UAPP 655 SOCIAL ENVIRONMENT AND HEALTH 3
Examines the relation between socioeconomic structure and health as a descriptive and conceptual framework for health policy analyses at national and local levels. Views relations between health levels and socioeconomic structure, and changes in socioeconomic structure from spatial and historical perspectives. Dimensions of socioeconomic structure include income, education, occupation, industry, employment and ethnicity.

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 1-3
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. May be cross-listed with POSC659.

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; planting 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 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

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 678 COASTAL AND MARITIME LAW 3
See MAST678 for course description.

UAPP 681 METROPOLITAN INFRASTRUCTURE AND TRANSPORTATION 3
Movement is essential for metropolitan area performance. Roads and water systems are infrastructures that affect the growth and development that impact on where houses, stores, shops, and jobs are located, which in turn links into movement, pollution, congestion. This course treats infrastructure decision making using approaches from public economics. May be cross-listed with POSC681.

PREREQ: UAPP684 or microeconomics.

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 inter-regional topics such as land use, migration, city-suburban shifts, and neighborhoods. Various kinds of regional policies are analyzed.

May be cross-listed with POSC683.

PREREQ: UAPP684 or microeconomics.

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 workforce and workplace). Seminar with individually-tailored projects. May be cross-listed with POSC685.

PREREQ: UAPP687

RESTRICTIONS: Based on prior coursework and professional experience, may be waived with instructor approval.

UAPP 686 STATE AND LOCAL GOVERNMENT: CONCEPT AND ISSUES 3
Examines 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 apparatuses used by subnational governments. Assesses their contemporary role in the federal system. May be cross-listed with POSC686.

UAPP 687 STATE GOVERNMENT POLICY AND MANAGEMENT 3
Focuses on roles and functions of United States state government. Topics to include legislative policy making and operations, executive branch organization and functions, structure and role of state courts, role of the governor and the states in intergovernmental policy making. State government in the Middle Atlantic region will receive special attention. May be cross-listed with POSC687.

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/instruments (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. May be cross-listed with POSC688.

UAPP 692 ENVIRONMENTAL VALUES, MOVEMENTS AND POLICY 3
See MAST692 for course description.

UAPP 800 RESEARCH DESIGN AND METHODOLOGIES 3
Provides skills and examines issues in research design, data acquisition and data analysis in urban affairs.
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.

UAPP 802 Electricity Policy and Planning 3
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.

UAPP 803 Seminar: Public Administration 3
See POSC803 for course description.

UAPP 804 Program Evaluation for Health and Social Services 3
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.

UAPP 806 Survey Research 3
Methods and procedures for the design, administration and analysis of sample surveys.

UAPP 808 Qualitative Methods for Program Evaluation 3
Provides skills and examines issues in the use of qualitative methods in the context of program evaluation. Qualitative design, sampling approaches, data collection, and analysis are included. PREQ: UAPP800 or equivalent research methods course.

UAPP 810 Political Economy of the Environment 3
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 MAST1841 and/or POSC814.

UAPP 815 Public Management Statistics 3
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.

UAPP 816 Advanced Social Statistics 3
See POSC816 for course description.

UAPP 817 Public Investment Policy 3
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.

UAPP 818 Environmental Policy and Administration 3
See POSC818 for course description.

UAPP 819 Management Decision Making in Public and Nonprofit Sectors 3
Focuses on analytical decision making within public and nonprofit organizations. Examines processes by which decisions are 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.

UAPP 820 International Perspectives on Energy and Environment 3
See POSC820 for course description.

UAPP 821 Seminar: Technology, Environment and Society 3
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.

UAPP 822 Seminar: Governance, Planning and Management 3
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.

UAPP 823 Seminar: Social and Urban Policy 3
Concerns about the effectiveness of public policies in urban areas. Emphasis is on the causes and effects of urban poverty and the role of social policy in the alleviation of poverty. Focuses on the role of policy in urban society.

UAPP 825 Comparative Public Administration 3
See POSC825 for course description.

UAPP 826 Multivariate Statistical Analysis 3
Provides an in-depth understanding of advanced statistical methods with an applied focus on estimation, inference, and prediction of models. Major topics are: multiple regression, functional forms, types of data, regression diagnostics (collinearity, serial correlation, heteroscedasticity, and simultaneity), different estimators, comparison of models, dummy dependent variables, dynamic models and lags, and multi-equation models.

UAPP 827 Program and Project Analysis 3
Explores how public sector decision makers evaluate feasibility of government programs and projects. Governmental and societal costs incurred and benefits that would result if public programs or capital projects were undertaken. Emphasizes the role of the political context in program design, urban activities and structures, and potential effectiveness should be handled.

UAPP 828 Urban Society and Public Policy 3
Examines the human resources function from three perspectives: 1) technical competencies (recruitment, selection, compensation, benefits), 2) legal and constitutional issues in HR, and 3) leadership and organizational change.

UAPP 830 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.

UAPP 831 Financial Management in Public and Nonprofit Sectors 3
Principles of public finance and public sector economics are used to examine issues of demand 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.

UAPP 832 Seminar in Governance, Planning and Management 3
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.

UAPP 833 Seminar: Social and Urban Policy 3
Concerns about the effectiveness of public policies in urban areas. Emphasis is on the causes and effects of urban poverty and the role of social policy in the alleviation of poverty. Focuses on the role of policy in urban society.

UAPP 835 Organization and Management in Public and Nonprofit Sectors 3
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 those organizations. Behavioral competencies are developed.

UAPP 836 Real World Ethics 3
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.

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.

UAPP 838 Public Policy Analysis 3
See POSC838 for course description.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Restrictions</th>
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<tr>
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<td>Law for Administrators</td>
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<tr>
<td>UAPP 840</td>
<td>History and Development of the Nonprofit Sector</td>
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<td>UAPP 841</td>
<td>Management and Governance of Nonprofit Organizations</td>
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<tr>
<td>UAPP 843</td>
<td>Global Governance: Theory and Cases</td>
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<td>UAPP 846</td>
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<td>UAPP 865</td>
<td>Doctoral Research Paper</td>
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<td>UAPP 868</td>
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<td>UAPP 869</td>
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<td>UAPP 870</td>
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<td>UAPP 899</td>
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<td>UNIV 101</td>
<td>First Year Experience I</td>
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<td>First Year Experience II</td>
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<td>First Year Experience III</td>
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<tr>
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<td>UNIV 320</td>
<td>Contingency Issues for Resident Assistants</td>
<td>1 PF</td>
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<tr>
<td>UNIV 351</td>
<td>Semester in Copenhagen</td>
<td>0 FT</td>
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<tr>
<td>UNIV 359</td>
<td>Semester at Biosphere 2 Center</td>
<td>0 NR</td>
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<tr>
<td>UNIV 369</td>
<td>Honors: Undergraduate Research Sustaining</td>
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<td>Research apprenticeship with faculty mentor</td>
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<tr>
<td>UNIV 401</td>
<td>Senior Thesis</td>
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<tr>
<td>UNIV 402</td>
<td>Senior Thesis</td>
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<tr>
<td>UNIV 490</td>
<td>Honors Tutorial: Humanities</td>
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<td>UNIV 495</td>
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<tr>
<td>UNIV 500</td>
<td>Leave of Absence</td>
<td>0 NR</td>
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<tr>
<td>UNIV 501</td>
<td>Learning</td>
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<tr>
<td>UNIV 502</td>
<td>Pedagogy</td>
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<tr>
<td>UNIV 503</td>
<td>Academic Job Search</td>
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<tr>
<td>UNIV 504</td>
<td>Master's Sustaining</td>
<td>0 FT</td>
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<tr>
<td>UNIV 505</td>
<td>Ph.D. Sustaining</td>
<td>0 FT</td>
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</tbody>
</table>

**University Course**

**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
  - PRIEREQ: UNIV101

**UNIV 103**
- **First Year Experience III**
  - 1 PF
  - Continuation of UNIV102
  - PRIEREQ: UNIV102

**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.

**UNIV 302**
- **Peer Mentor Practicum II**
  - 1 PF
  - Continuation of UNIV301
  - PRIEREQ: UNIV301

**UNIV 303**
- **Peer Mentor Practicum III**
  - 1 PF
  - Continuation of UNIV302
  - PRIEREQ: UNIV302

**UNIV 320**
- **Contingency Issues for Resident Assistants**
  - 1 PF
  - Introduces new resident assistants to issues affecting college students. All topics covered in the course focus on the needs of the new resident assistant in the Office of Housing and Residence Life.
  - RESTRICTIONS: Must be a resident assistant

**UNIV 351**
- **Semester in Copenhagen**
  - 0 FT

**UNIV 359**
- **Semester at Biosphere 2 Center**
  - 0 NR

**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, University Honors Program.

**UNIV 401**
- **Senior Thesis**
  - 2-4 PF
  - Senior thesis for students working toward a degree with distinction.
  - RESTRICTIONS: Total credit for UNIV401 and UNIV402 not to exceed six.

**UNIV 402**
- **Senior Thesis**
  - 2-4 PF
  - Continuation of UNIV401.
  - RESTRICTIONS: Total credit for UNIV401 and UNIV402 not to exceed six.

**UNIV 490**
- **Honors Tutorial: Humanities**
  - 3 PF
  - 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 PF
  - 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 individual discussions.
  - RESTRICTIONS: Requires 3.4 GPA, Junior standing or above, and permission of the Honors Program.

**UNIV 495**
- **Honors Seminar**
  - 3 PF
  - Topics vary, usually interdisciplinary.
  - RESTRICTIONS: Requires 3.4 GPA, Junior status or above, and permission of the Honors Program.

**UNIV 500**
- **Leave of Absence**
  - 0 NR

**UNIV 501**
- **Learning**
  - 0 PF
  - Explodes cognitive, affective, and social aspects of learning process through research and reflection of existing learning and teaching literature in higher education. Learning Modules develop skills for learning in respective disciplines. Modern information technologies and library resources access essential.
  - RESTRICTIONS: May be repeated with different Learning Module.

**UNIV 502**
- **Pedagogy**
  - 0 PF
  - Presents sound teaching principles, innovative teaching methodologies, and issues of effectiveness. Pedagogy Modules with practical orientation to enhance teaching and classroom performance in respective disciplines. Opportunity to observe and reflect UD faculty recognized for outstanding instructional practices. Modern information technologies and library resources access essential.
  - RESTRICTIONS: May be repeated with different Pedagogy Module.

**UNIV 503**
- **Faculty Roles**
  - 0 PF
  - Introduces the range of faculty roles and responsibilities at different types of academic institutions. Faculty Roles Modules assist with identifying ideal academic settings with understanding of possibilities and responsibilities consonant to such appointments. Modern information technologies and library resources access essential.

**UNIV 504**
- **Academic Job Search**
  - 0 PF
  - Preps for insertion into academic work place by focusing on resume construction, teaching portfolio preparation, and refining interviewing skills. Modern information technologies and library resources access essential.

**UNIV 505**
- **Master's Sustaining**
  - 0 FT

**UNIV 506**
- **Ph.D. Sustaining**
  - 0 FT
WOMEN’S STUDIES

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 cultural and economic status, social norms and institutional structures on women’s conditions in family life, education and employment.

WOMS 203 CONTEMPORARY MURAL PROBLEMS 3
See PHIL202 for 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 and non-Western women, and study of the relationship between women’s social-economic 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 SOC206.

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 PHIL210.

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, work, military, violence and the implications of feminism for men. Issue oriented. May be cross-listed with SOC211.

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 SOC213 for course description.

WOMS 216 INTRODUCTION TO FEMINIST THEORY 3
See PHIL216 for course description.

WOMS 222 LANGUAGE AND GENDER 3
See ING222 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 CSCC233.

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 IMPAGEMAKER 3
See ARTH242 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 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 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 HIST291.

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 AMST298.

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, etc. RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 300 WOMEN IN AMERICAN HISTORY 3
See HIST300 for course description.

WOMS 302 WOMEN IN MUSIC: AN ALTERNATE SURVEY 3
See MUSC302 for course description.

WOMS 305 THE EVOLUTION OF HUMAN SEX ROLES AND REPRODUCTION 3
See ANTH305 for course description.

WOMS 311 RENAISSANCE WOMEN, SOCIETY AND ART 3
See ART311 for course description.

WOMS 315 THIRD WORLD WOMEN IN POLITICS 3
See POSC315 for course description.

WOMS 318 STUDIES IN FILM 3
See ENGL318 for course description.

WOMS 320 VARYING AUTHORS AND GENRES 3
See FLJ320 for course description.

WOMS 321 TOPICS: CHINESE LITERATURE IN TRANSLATION 3
See FLLT321 for course description.

WOMS 322 TOPICS: CLASSICAL LITERATURE IN TRANSLATION 3
See FLLT322 for course description.

WOMS 323 INTRODUCTION TO WOMEN AND POLITICS 3
See POSC323 for course description.

WOMS 326 TOPICS: HISPANIC LITERATURE IN TRANSLATION 3
See FLLT326 for course description.

WOMS 327 RACE, GENDER, SCIENCE 3
See PHIL327 for course description.

WOMS 328 TOPICS: JAPANESE LITERATURE IN TRANSLATION 3
See FLLT328 for course description.

WOMS 329 TOPICS: ITALIAN LITERATURE IN TRANSLATION 3
See FLLT329 for course description.

WOMS 330 VARYING AUTHORS, THEMES AND MOVEMENTS 3
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WOMS 333 PSYCHOLOGY OF WOMEN 3
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WOMS 334 AFRICAN AMERICAN WOMEN’S HISTORY 3
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Provides a survey introduction to women's studies for graduate students.