

Course Listings

The following section of the *Catalog* lists all of the undergraduate courses offered at Villanova as of Fall 2001. Villanova University changes its course offerings frequently to keep in touch with changing developments in the various fields. Please see www.catalog.villanova.edu for current courses listings. Each listing gives the name of the course, a brief description, the number of credits that the course carries, and the restrictions and prerequisites (if any). Each listing also gives a history, showing when the course was offered most recently. While the course histories give a rough indication of how frequently the course may or may not be offered in the future, students with questions about whether specific courses will be offered should contact the department that offers the course.

In this section, the courses are listed alphabetically by subject (not by department). The table below explains the abbreviations, and also shows the department (or program) and the college that offers the course. Sometimes a department will offer courses in two or more subjects. Programs (such as the Ethics program) usually offer courses under their own name but also rely on courses taught by other departments. The chart below lists the abbreviation, the subject name, the department that offers the course, and the college (Liberal Arts and Sciences, Engineering, Commerce and Finance, or Nursing).

<i>Code</i>	<i>Subject</i>	<i>Department or Program</i>	<i>College</i>
AAH	Art History	History Dept.	LA&S
ACC	Accountancy	Accountancy Dept.	C&F
AER	Aerospace Studies	Aerospace Studies Dept.	A&S
AFR	Africana Studies	Africana Studies Program	LA&S
AIS	Arab and Islamic Studies	Arab and Islamic Studies Program	LA&S
ARB	Arabic	Classical and Modern Languages and Literature Dept.	LA&S
AST	Astronomy and Astrophysics	Astronomy and Astrophysics Dept.	LA&S
BIO	Biology	Biology Dept.	LA&S
BL	Business Law	Marketing Dept.	C&F
BUS	Business	Summer Business Institute	C&F
CEE	Civil and Environmental Engineering	Civil and Environmental Engineering Dept.	Engr.
CGS	Cognitive Science	Cognitive Science Program	LA&S
CHE	Chemical Engineering	Chemical Engineering Dept.	Engr.
CHI	Chinese	Classical and Modern Languages and Literature Dept.	LA&S
CHM	Chemistry	Chemistry Dept	LA&S
CHS	Core Humanities	Core Humanities Program	LA&S
CJ	Criminal Justice	Sociology Dept.	LA&S
CLA	Classical Studies	Classical and Modern Languages and Literature Dept.	LA&S
COM	Communication	Communication Dept.	LA&S
CSC	Computing Sciences	Computing Sciences Dept.	LA&S
DIT	Decision and Information Technologies	Decision and Information Technologies Dept.	C&F
ECE	Electrical and Computer Engineering	Electrical and Computer Engineering Dept.	Engr.
ECO	Economics	Economics Dept.	C&F and LA&S
EDU	Education	Education and Human Services Dept.	LA&S
EGR	Engineering	College of Engineering	Engr.
ENG	English	English Dept.	LA&S
ETH	Ethics	Ethics Program	LA&S
FIN	Finance	Finance Dept.	C&F
FRE	French	Classical and Modern Languages and Literature Dept.	LA&S

GEO	Geography	Political Science Dept.	LA&S
GER	German	Classical and Modern Languages and Literature Dept.	LA&S
GRK	Greek	Classical and Modern Languages and Literature Dept.	LA&S
HIS	History	History Dept.	LA&S
HON	Honors	Honors Program	LA&S
HS	Human Services	Education and Human Services Dept	LA&S
IS	Irish Studies	Irish Studies Program	LA&S
ITA	Italian	Classical and Modern Languages and Literature Dept.	LA&S
JPN	Japanese	Classical and Modern Languages and Literature Dept.	LA&S
LA	Liberal Arts	Liberal Arts Program	
LAT	Latin	Classical and Modern Languages and Literature Dept.	LA&S
MAT	Mathematical Sciences	Mathematical Sciences Dept.	LA&S
ME	Mechanical Engineering	Mechanical Engineering Dept.	Engr
MET	Meteorology	Astronomy and Astrophysics Dept.	LA&S
MGT	Management	Management Dept.	C&F
MKT	Marketing	Marketing Dept.	C&F
ML	Modern Languages	Classical and Modern Languages and Literature Dept.	LA&S
MS	Military Science	Military Science Dept. (Army ROTC)	LA&S
NS	Naval Science	Naval Science Dept. (Navy ROTC)	LA&S
NTR	Nutrition	College of Nursing	Nursing
NUR	Nursing	College of Nursing	Nursing
PHI	Philosophy	Philosophy Dept	LA&S
PHY	Physics	Physics Dept.	LA&S
PJ	Peace and Justice	Peace and Justice Program	LA&S
PSC	Political Science	Political Science Dept.	LA&S
PSY	Psychology	Psychology Dept.	LA&S
RAS	Russian Area Studies	Russian Area Studies Program	LA&S
RUS	Russian	Classical and Modern Languages and Literature Dept.	LA&S
SAR	Studio Art and Music	Theatre Dept.	LA&S
SCI	Comprehensive Sciences	Comprehensive Sciences Dept.	LA&S
SOC	Sociology	Sociology Dept.	LA&S
SPA	Spanish	Classical and Modern Languages and Literature Dept.	LA&S
STA	Statistics	Decision and Information Technologies Dept	C&F
THE	Theatre	Theatre Dept.	LA&S
THL	Theology and Religious Studies	Theology and Religious Studies Dept.	LA&S
WS	Women's Studies	Women's Studies Program	LA&S

AAH 1000 Introduction to Art The elements of art: form, color, line, design, materials, and techniques. For students who would like to improve their ability to understand painting, sculpture, and architecture. (3 cr)

AAH 1100 Intro To Art The elements of art: form, color, line, design, materials, and techniques. For students who would like to improve their ability to understand painting, sculpture, and architecture. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

AAH 1101 His West Art: Ancient - Med Architecture, sculpture, and painting in the West from ancient times through medieval and High Gothic periods. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 2000, Fall 1999.*

AAH 1102 His West Art: Renaiss - Cont The history of the visual arts in the West from the Early Renaissance to the present. (3 cr)
Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.

AAH 2000 Ancient Art The artistic contributions of the ancient societies of Egypt, the Aegean, Greece and Rome, placed within appropriate cultural contexts. (3 cr) *Last offered: Fall 2001, Spring 2000, Fall 1998, Spring 1998.*

AAH 2001 Medieval Art The development of Western art from the death of Jesus to 1300 A.D. with emphasis on the Catholic Church as the main patron of painting, sculpture, and architecture during the Middle Ages. (3 cr) *Last offered: Fall 2001, Fall 2000, Summer 1999, Spring 1999.*

AAH 2002 Renaissance Art New trends and forms in European Art from 1300 to 1600; an examination of leading artists, their lives and works: Giotto, Leonardo Da Vinci, Michelangelo, among others. (3 cr) *Last offered: Spring 2001, Spring 1995.*

AAH 2003 Age of Rembrandt & Bernini Major works of European painting, sculpture, and architecture from the seventeenth through mid-eighteenth centuries. Special emphasis on how historical events affected the production of artistic monuments. (3 cr)
Last offered: Spring 2001, Fall 1999, Fall 1997.

AAH 2004 Modern Art An examination of the visual arts since 1900 that emphasizes their historical roots and present social significance. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

AAH 2006 American Art The history of painting, sculpture, and architecture in America from the colonial period to modern times. (3 cr) *Last offered: Spring 2000.*

AAH 2007 Hist. of Western Architecture Development of architectural styles from the Gothic to the contemporary, with emphasis on the modern period. (3 cr) *Last offered: Fall 2001, Summer 2001, Summer 2000, Summer 1999.*

AAH 2008 Spirit of the Renaissance The relationship of painting, sculpture, architecture, and graphic arts from the rise of the Sieneese and Florentine School to the end of the Venetian school. (3 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.*

AAH 2993 Internship (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

AAH 3001 Women in Art Themes and images of women in the visual arts as an expression of the needs, desires and attitudes of society; and a study of women artists from ancient times to the present, with regard to how being female may, or may not, have affected their work. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 1999, Spring 1998.*

AAH 3002 Art of Philadelphia Philadelphia's unique contribution to American painting, sculpture, and architecture, from the early Swedish and Welsh settlers of the Delaware Valley, to Andrew Wyeth and Robert Venturi. (3 cr) *Last offered: Spring 2001, Fall 1999, Spring 1999, Fall 1998.*

AAH 3003 Romantic to Post-Impress Nineteenth century painting and sculpture in Europe and America, focusing on Cezanne, Courbet, Delacroix, Goya, Eakins, Homer, Manet, Monet, Rodin and West. (3 cr) *Last offered: Spring 2001.*

AAH 3007 The Art of Ireland The visual arts in Ireland concentrating on the Golden Age from the 5th to the 9th Century: architecture of the early monastic settlements, manuscript illumination and its influence, and the cultural impact of the Irish forms of monasticism. (3 cr) *Last offered: Summer 2001, Fall 2000, Summer 2000, Fall 1999.*

AAH 3009 Topics in Art History Selected themes or periods in the history of art examined in depth. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

AAH 3010 Art Historical Methodology A survey of the various types of art history which have been practiced over the centuries, including connoisseurship, iconography, the social history of art, Feminist art history, Postmodern art history, semiotics, and Deconstructionist art history. (3 cr) *Last offered: Fall 2000.*

AAH 4000 Senior Thesis Independent research projects under the guidance of a department faculty member. Passing grade depends on student thesis acceptable to two faculty members. (3 cr) *Restriction: Restricted to AAH Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

AAH 4001 American Architecture Seminar on architecture and city planning in the United States from colonial times to the present. (3 cr) *Last offered: Spring 2001, Fall 1996, Fall 1995, Spring 1995.*

AAH 4003 Spec Topics: Ancient-Medieval Seminar on selected topics in ancient or medieval art as announced. Topics will vary depending on the instructor. (3 cr) *Last offered: Summer 1998, Fall 1997, Spring 1997, Fall 1996.*

AAH 4004 Spec Top: Renais-Baroque Seminar on architecture, painting, sculpture and art theories of the Renaissance or Baroque as announced. Topics will vary depending on the instructor. (3 cr) *Last offered: Fall 1999, Spring 1997.*

AAH 4005 Picasso and Friends Seminar on the 20th century's most famous artist, with discussion of friends such as Braque, Apollinaire, Gertrude Stein, and Erik Satie. (3 cr) *Last offered: Spring 2000, Spring 1998, Spring 1997, Spring 1996.* Prerequisites: AAH 2004.

AAH 4007 Special Topics Seminar on advanced topics in modern painting, sculpture, and architecture. This course will cover European and American art of the period from 1750 to the present day. Reports and research paper required. Pre-requisite: AAH 2004 or permission of instructor (3 cr) *Last offered: Fall 1998, Spring 1998, Fall 1996, Fall 1995.*

ACC 1001 Comp Apps and Acctg Introduction to various financial accounting concepts and terms, transaction analysis, financial statements, and ratio analysis. Students gain a working knowledge of communication software, database software, and presentation software, and an advanced knowledge of spreadsheet software. Internet searches, Web-page design, and computer technology to address various financial and managerial accounting project. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ACC 1002 Adv Computer Apps and Acctg (3 cr) *Last offered: Fall 2000, Spring 2000.*

ACC 1101 Prin of Financial Accounting Understanding business by being able to understand the financial statements. Accounting concepts, transaction analysis, analytical procedures, valuation and allocation, revenue recognition and expense matching, and cash flow analysis - operating, investing, and financing. Includes appropriate use of technology. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ACC 1001.

ACC 1102 Prin of Managerial Accounting How management accounting information can be used to help firms achieve strategic goals and profitability objectives. Use of an entrepreneurial perspective to examine how managers apply risk measurement and management techniques to business planning and control systems. Case-based learning to help students develop communication, technology, and teamwork. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ACC 1001 or ACC 1002 and ACC 1101.

ACC 2310 Intermediate Accounting I Intensive study and application of GAAP for asset valuation, income measurement, and financial statement presentation for business organizations, and the processes through which these principles evolve. Coverage of topics essential to preparing, reading, understanding, interpreting and using financial statements. Extensive reliance on case method. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Summer 1999.* Prerequisites: ACC 1101.

ACC 2320 Intermediate Accounting II Continues the intensive study and application of GAAP for asset valuation, income measurement, and financial statement presentation begun in ACC 2310. Selected accounting and consulting issues. Correction of financial statements, income taxes, pensions, segment reporting, cash-flow disclosures, debt issuance and amortization, leases, and investments. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: ACC 2310.

ACC 2420 International Accounting (3 cr)

ACC 2430 Auditing Auditing standards employed in verification of and reporting on financial statements, evaluation of controls, statistical sampling, substantive testing, legal liability and professional responsibilities, and professional standards of ethics. Includes written and oral group case assignments and application of computer technology. Restricted to Accounting majors and minors. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: ACC 2320.

ACC 2450 Advanced Accounting Theories and techniques used for specialized accounting problems, with emphasis on business combinations, consolidations, multinational corporations, not-for-profit entities partnerships, and issues related to solvency and liquidation and financial fraud. Restricted to Accounting majors and minors. (3 cr) *Last offered: Spring 2001, Spring 2000, Summer 1999, Spring 1999.* Prerequisites: ACC 2310.

ACC 2460 Federal Income Tax An introduction to federal income taxation with primary emphasis on the tax implications of business transactions. Objectives of the course are to explore tax-policy issues and to develop a basic understanding of federal income tax laws, income tax planning, and the impact of taxes on business decisions. Restricted to Accounting majors and minors with Senior standing. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ACC 2470 Cost Accounting Introduction to modern cost accounting systems and the accounting information needs of managers, including: costing approaches (job-order process, standard, and absorption); cost behavior analysis; differential costs for decision-making; activity-based costing (ABC) and activity-based management (ABM); performance evaluation; and, issues related to quality. Group work and case analysis (both oral and written) required. Writing enhanced course. Restricted to Accounting majors and minors with Senior standing. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ACC 1102 or HON 1102.

ACC 2480 Advanced Taxes Advanced federal income tax problems and issues as they pertain to individuals, partnerships, corporations, and estates and trusts. Emphasis on tax planning, including use of appropriate computer software. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: ACC 2460.

ACC 2490 Advanced Cost Accounting (3 cr)

ACC 3430 Accounting Internship Employment with approved accounting firms and business organizations; varied work experience with appropriate training, instruction, and supervision. Paper required. Restricted to Accounting majors and minors with junior or senior standing, a minimum GPA of 2.5, and approval of the Accounting Internship Director. Satisfactory/Unsatisfactory only. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ACC 3500 Ind Study: Accounting (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

AER 1011 Air Force Today I The military as a profession, including: civilian control of U.S. Armed Forces, functions and organization of the U.S. Air Force, organization and operations of U.S. strategic offensive forces. (1 cr) Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.

AER 1012 Leadership Lab (0 cr) Last offered: Spring 2001.

AER 1021 Air Force Today II The U.S. general purpose and defensive forces including: Mission and organization of the major U.S. Air Force Commands and separate operating agencies, major functions and conduct of joint service military operations. Air defense, detection systems, close air support, and air superiority. (1 cr) Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.

AER 1022 Leadership Lab (0 cr) Last offered: Spring 2001, Spring 2000.

AER 1031 The Air Force Way I Aerospace power from balloons and dirigibles through the employment of U.S. air power in World War II. The military theory of aerospace power employment. (1 cr) Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.

AER 1041 The Air Force Way II Employment of U.S. air power in the Korean Conflict, relief missions and civic action programs in the later 1960s, and the war in Southeast Asia. The military theory of aerospace force employment. (1 cr) Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.

AER 2011 Air Force Leadership and MGT I Managerial theory, concepts and techniques of decision-making, and the basic functions of management with particular emphasis on applications for Air Force officers. (3 cr) Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.

AER 2021 Air Force Leadership & Mgt II An interdisciplinary approach to leadership which includes study of human behavior and relationships, and motivation. (3 cr) Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.

AER 2031 National Security Issues I The Armed forces as an integral and inseparable element of society. Emphasis on the overall national security process and the factors which comprise it. The impact of a nation's military, economic psychological, and technical components on national security policy. Major geopolitical hotspots and the origin of arms races. (3 cr) Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.

AER 2041 National Security Issues II Civilian control of the military, conflict control, military professionalism, and military justice. Emphasis on the reciprocal responsibilities of civilians and the military in a democratic society. (3 cr) Last offered: Spring 2001, Spring 2000, Spring 1999.

AFR 5000 Ind. Study Africana Studies Permission of Program Director. Individual students with specific interest work on a tutorial basis with an appropriate professor. (3 cr)(3 cr) Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.

AIS 1111 Basic Arabic (3 cr)

AIS 4100 Sem: Arab & Islamic st (3 cr) Last offered: Spring 2001, Fall 2000, Spring 2000, Spring 1999.

ARB 1111 Basic Arabic I Functional use of Modern Standard Arabic for students with no prior knowledge of Arabic. Recitations, readings and oral drills, supplementary language laboratory work. (6 cr) Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.

ARB 1112 Basic Arabic II Functional use of Modern Standard Arabic for students with no prior knowledge of Arabic. Recitations, readings and oral drills, supplementary language laboratory work. (6 cr) Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.

ARB 1121 Intermediate Arabic I Review of grammar and vocabulary. Recitations, readings and oral drills. Supplementary language laboratory work. (5 cr) Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.

ARB 1122 Intermediate Arabic II Review of grammar and vocabulary. Recitations, readings and oral drills. Supplementary language laboratory work. (5 cr) Last offered: Summer 2001, Summer 2000, Spring 2000, Spring 1999.

ARB 1131 Intensive Adv Arabic I Advanced communication skills including reading and discussing topics on current events. Supplementary language laboratory work. (3 cr) Last offered: Fall 2000, Fall 1999, Summer 1999, Fall 1998.

ARB 1132 Intensive Adv Arabic II Advanced communication skills including reading and discussing topics on current events. Supplementary language laboratory work. (3 cr) Last offered: Summer 1999, Spring 1998, Spring 1997.

ARB 1141 Intro to Coll Egypt Arabic Training in the use of colloquial Egyptian Arabic, focusing on listening and speaking skills. Supplementary laboratory work and drills. (3 cr) Last offered: Spring 2000, Fall 1999, Spring 1999, Fall 1998.

ARB 2100 Arabic Lit in English Trans The major works of Arabic literature in translation. Conducted in English. Satisfies Diversity Requirement. Fulfills advanced literature requirements. (3 cr) Last offered: Spring 1998.

ARB 2141 Arab-Andulasian Legacy The impact of the Arab period on the Iberian Peninsula from the historical, cultural and literary viewpoints. Fulfills advanced literature requirements. (3 cr)

ARB 2142 Arab Culture & Civilization Arab culture and civilization with emphasis on the Arab people's contribution to the arts and sciences. Satisfies Diversity Requirement. (3 cr) Last offered: Fall 2000, Summer 1999, Fall 1996, Fall 1995.

AST 1050 Planet Earth I Earth as a planetary member of the Solar System. Characteristics, history of formation, dynamics, and evolution of the solar system. Emphasis on the fundamental scientific principles at work throughout the universe. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: AST 1051.

AST 1051 Planet Earth Lab I Laboratory to accompany Planet Earth I. Astronomical observations and principles of experimentation both with real physical experiments and computer simulations. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: AST 1050.

AST 1052 Planet Earth II A continuation of AST 1050 (Planet Earth I). (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: AST 1050. Corequisites: AST 1053.

AST 1053 Planet Earth Lab II A continuation of AST 1051 (Planet Earth II). (1 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Corequisites: AST 1052.

AST 1072 Birth & Death of Stars A study of the life cycles of the stars from their birth in dark, dense interstellar dust clouds to their deaths in nature's most violent cataclysms with a focus on stars and humanity, the formation of the chemical elements, the effects of nearby supernovae, the future of the Sun and the ultimate fate of Earth, and the question of planetary systems around other stars. Co-requisite for Arts students: AST 1073 (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

AST 1073 Stellar Lab Laboratory focuses on stellar and galactic problems. Co-requisite: AST 1073, 2122 or 2120. (1 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

AST 1074 Planets The surfaces and atmospheres of other worlds and how they compare to Earth with a focus on the physical processes which mold their landscapes and both generate and modify their gaseous atmospheres. The geology and meteorology of planets and their moons; the role of destructive collisions versus accretion and re-compaction. The effects of collisions with asteroids and comets, their role in mass extinctions, and in the possible formation of atmospheres and oceans; the search for planets and life in our solar system and beyond. Co-requisite for Arts students: AST 1075. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

AST 1075 Planets Lab A continuation of Astronomy Lab I that focuses on planetary and solar system problems. Co-requisite: AST 1075 or AST 2121. (1 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

AST 1101 The Solar System (3 cr)

AST 1102 Exploration of the Universe (3 cr)

AST 1131 Astronomy Laboratory I (1 cr)

AST 1151 Astronomical Ideas The evolution (and revolution) of human views and understanding of the sky from pretechnology cultures (e.g., Stonehenge, the American Southwest), through the sophisticated cultures of the ancient Near East, the ancient Greeks, the Renaissance (Copernicus, Galileo, Newton) and into the Twentieth Century. (3 cr) *Last offered: Spring 1999, Fall 1997, Fall 1996, Fall 1995.*

AST 2120 Sun and Stars A technical study of the Sun and other stars; their internal constitutions and atmospheres, life cycles and evolutionary processes, memberships in groups, the radiations they produce, and the manner in which astronomers quantify their characteristics. Prerequisite: MAT 1500 or above. Open to science, engineering and math majors. Non-Astronomy majors may elect AST 1073 as a lab. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Spring 1999.* Prerequisites: (AST 2121 or AST 2122).

AST 2121 Solar System Astronomy The science of the solar system: early ideas of the nature of the solar system; the dynamics and compositions of the planets; atmospheric evolution and maintenance. The manner with which comets and meteorites reveal the structures of the primitive solar system. Prerequisite: MAT 1500 or above. Open to science, engineering and math majors. Non-Astronomy majors may elect AST 1075 as a lab. (3 cr) *Last offered: Spring 2001, Spring 2000, Fall 1998, Fall 1997.*

AST 2122 Galaxies and Cosmology The universe beyond the solar system: galactic structure, galactic evolution, and the current cosmological models of the large scale structure of the universe. Prerequisite or Corequisite: MAT 1500 or above. Open to science, engineering and math majors. Non Astronomy majors may elect AST 1073 as a lab. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

AST 2133 Observational Lab I Astronomical instruments, methods of observing, reduction of observations, and discussion of astronomical data. Observations include CCD imaging, spectroscopy, and photoelectric photometry using the observatory reflector and Schmidt telescopes. Two hours per week in the laboratory in addition to the observing time necessary to complete the assigned projects. Corerequisite or prerequisite: AST 2120. (2 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

AST 2134 Observational Lab II Continuation of AST 2122. (2 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: AST 2133.

AST 3121 Directed Studies I Studies in selected areas under the direction of a staff member. (2 cr)

AST 3122 Directed studies II Studies in selected areas under the direction of a staff member. (2 cr)

AST 3131 Sem Astro & Astrophysics Seminar on special topics in Astronomy and Astrophysics. (1 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000.*

AST 3141 Galactic Astronomy The nature, distribution, and motions of the constituents of the Galaxy; the major star system in which our Sun is located the stars, the gas and dust, star clusters, etc.; stellar distance determination, distribution of stars and gas, stellar kinematics, galactic dynamics, galactic radio emission, cosmic rays, and evolution of galaxies. Prerequisite: one year of mathematics or physics and either AST 2120 or AST 2122. (3 cr) *Last offered: Fall 2000, Fall 1998, Fall 1996.*

AST 3142 Intro to Astrophysics Theories of stellar atmospheres, line-broadening and formation, radiative transfer, theoretical spectra, and the theory of stellar interiors are covered. Fundamental stellar timescales, thermonuclear reactions, evolutionary models, stellar pulsations, novae and supernovae. (3 cr) *Last offered: Spring 2001, Spring 1999, Spring 1997, Spring 1995.* Prerequisites: AST 2120 or AST 2122 and PHY 2410.

AST 3152 Astrodynamics Problems dealing with orbit determination, artificial satellites, space travel and related subjects. MAT 1505 or above. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1998, Spring 1996.* Prerequisites: AST 2121.

AST 4121 Undergrad Research I Student participation in departmental or independent research under faculty supervision; frequent conferences on literature search, research techniques, experimental procedures and results. (3 cr) *Last offered: Spring 2001, Fall 2000, Fall 1999, Fall 1998.*

AST 4122 Undergrad Research II Continuation of AST 4121. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Spring 1999.*

BIO 1101 Biology General principles, cells and energy, hereditary mechanisms, survey of organisms, evolution and ecological principles. For non-biologists who do not plan a more extensive study of biology. Open to C & F majors. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

BIO 1181 Cell Biology and Genetics The structure of prokaryotic and eukaryotic cells; microbial classification; control of microbial growth, principles of disease; pathogenic mechanisms; host defenses. Eukaryotic and prokaryotic gene organization and function; analysis of patterns of inheritance; recombinant DNA technology; linkage and genetic maps, genetic variation in human populations; inheritance, diagnosis and treatment of metabolic disease; cytogenetics; immunogenetics; cancer; developmental genetics. Open to Nursing majors. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

BIO 1205 Human Anat & Physiology I Basic concepts and laboratory studies of anatomy and physiology with presentation of overall morphology and function of the integumentary, skeletal, muscular, nervous, and endocrine systems. Open to Nursing majors. (4 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

BIO 1206 Human Anat & Physiol II Continuation of Biology 1205. The structure and function of the blood, vascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Open to Nursing majors. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

BIO 1303 General Biology II (3 cr)

BIO 1401 Microbiology Fundamentals of structure, function, and characteristics of microorganisms and their interaction with host organisms; basic microbiological techniques carried out or demonstrated in laboratory. Open to Arts sophomores. (3 cr) *Last offered: Spring 2000, Spring 1998, Spring 1997, Fall 1996.* Corequisites: BIO 1402.

BIO 1402 Microbiology Lab Basic microbiological techniques carried out or demonstrated in laboratory. Open to Arts sophomores. (1 cr) *Last offered: Spring 2000, Spring 1998, Spring 1997, Spring 1996.* Corequisites: BIO 1401.

BIO 1505 Biology for Today Biology of cells, comparative animal physiology, genetics, reproduction and development, evolutionary biology and ecology. Experimental approaches used by biologists in problem solving. Writing assignments on the interpretation of science presented in the news media. Open to Arts sophomores. (4 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

BIO 1555 Environmental Science Fundamentals of ecology; energy use and alternatives for the future; mineral resources; population, food nutrition, hunger; air and water pollution; pesticides; waste disposal; global warming; oil spills. Open to Arts sophomores. (4 cr) *Last offered: Spring 2001, Summer 1998, Spring 1998, Spring 1997.*

BIO 1605 Heredity & Human Affairs Genetic variation in humans and human populations including metabolic diseases, chromosomal aberrations and cancer. Genetic aspects of biotechnology, biodiversity and environmental hazards. Open to Arts sophomores. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

BIO 1625 How Microbes Rule the World How microbes benefit humans through the recycling of elements and their uses in food and fuel production, water purification and detoxification of wastes. Microbes as the causative agents of disease and as agents to produce lifesaving cures through biotechnology. Open to Arts sophomores. (4 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

BIO 1655 Human Physiology - Body Works The principles and mechanisms underlying how the human body functions, with emphasis on physical fitness. Open to Arts sophomores. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

BIO 1705 Life in the Sea Fundamentals of chemical, physical, and geological oceanography and their relationship to the evolution of marine organisms. The biology and ecology of marine algae, invertebrates, fishes and marine mammals. The ecological dynamics of marine habitats including saltmarshes, coral reefs and the deep sea. Open to Arts sophomores. (4 cr) *Last offered: Spring 2001, Spring 1999, Spring 1997, Spring 1995.*

BIO 1785 Special Themes in Biology A selected theme on some aspect of biology. Topics will be announced. Specific information will be available in the department office. Open to Arts sophomores. (4 cr) *Last offered: Spring 2001, Spring 2000.*

BIO 1903 Internship Elective Open to BIO and BSC majors. (3 cr) *Restriction: Restricted to BSC Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

BIO 1906 Internship Elective Open to BIO and BSC majors. (6 cr) *Restriction: Restricted to BSC Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

BIO 1909 Internship Elective Open to BIO and BSC majors. (9 cr) *Restriction: Restricted to BSC Majors. Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

BIO 2105 General Biology I An introduction to biological organization stressing the molecular and cellular aspects of living organisms. The chemistry of life, the cell, the gene, and mechanisms of evolution. (4 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

BIO 2106 General Biology II The origin of life and diversity of organisms seen in five biological kingdoms. Topics include nutrient acquisition, digestion, circulation, response to stimuli, movement, reproduction, behavior, and ecology. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

BIO 2993 Internship Open to BIO and BSC majors. (3 cr) *Restriction: Restricted to BSC Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

BIO 2996 Internship Open to BIO and BSC majors. (6 cr) *Restriction: Restricted to BSC Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

BIO 3011 Animal Behavior Causation, development, ecology, evolution of behavioral patterns, behavioral genetics, neuroethology, communication, foraging territoriality, mating systems, parental behavior, social organization. Emphasis on ultimate explanations. (3 cr) *Last offered: Spring 2000, Spring 1999, Summer 1998, Spring 1998.* Prerequisites: (BIO 2105 and BIO 2106) or (HON 1075 and HON 1076).

BIO 3012 Animal Behavior Lab Methods for observing behavior and for collection, statistical analysis, and interpretation of behavioral data. Exercises in lab and field, discussion, and small- group independent research projects. (1 cr) *Last offered: Spring 2000, Spring 1999, Summer 1998, Spring 1998.* Prerequisites: (BIO 2105 and BIO 2106) or (HON 1075 and HON 1076). Corequisites: BIO 3011.

BIO 3055 Animal Physiology The basic principles underlying how animals function and the mechanisms used to solve physiological problems. (4 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Summer 2000.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).

BIO 3105 Biometry Statistical treatment and interpretation of data obtained from biological experiments, emphasizing analytical procedures in relation to growth and development. (4 cr) *Last offered: Fall 2001, Fall 1996, Fall 1995.* Prerequisites: BIO 2105 and BIO 2106.

BIO 3155 Comparative Anatomy Evolution of homologous structures of vertebrates including functional considerations. Laboratory includes systematic and topical dissection of representative chordates and demonstrations of living organisms' functions. (4 cr) *Last offered: Spring 2001, Fall 1999, Fall 1998, Fall 1997.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).

BIO 3225 Intro to Electron Microscopy Introduction to specimen production for and use of scanning and transmission electron microscopes. (4 cr) *Last offered: Fall 2000, Spring 1999, Fall 1996.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).

BIO 3255 Introductory Ecology Factors affecting the distribution, abundance, and interactions of organisms. Climate patterns, biomes, physiological adaptation, population dynamics, behavioral ecology, species interactions, community structure, ecosystem function, and environmental problems. Hypothesis testing using statistical analysis of data. (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1075).

BIO 3351 Genetics Transmission genetics, cytogenetics, gene expression and regulation and population genetics. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).

BIO 3405 Higher Vertebrates Evolutionary history, diversification and basic biology of birds and mammals: ecological and physiological adaptations, reproductive biology, social behavior, population ecology, life history strategies, taxonomy and identification. Field trips. (4 cr) *Last offered: Fall 2001, Spring 1998, Fall 1997, Fall 1995.* Prerequisites: BIO 2105 and BIO 2106.

- BIO 3455 Histology** The microscopic study and demonstration of cells, tissues and organ systems of the mammalian body. (4 cr)
Last offered: Spring 2001, Spring 2000, Summer 1999, Spring 1999. Prerequisites: (BIO 2105 or HON 1075) and (BIO 1206 or HON 1076).
- BIO 3505 Invertebrate Zoology** The anatomy, taxonomy, evolution, physiology, development, ecology and behavior of invertebrates. The comparative approach in both field and laboratory. (4 cr) *Last offered: Fall 2000, Fall 1998, Fall 1996.*
Prerequisites: BIO 2105 and BIO 2106.
- BIO 3555 Lower Vertebrates** The biology of fishes, amphibians and reptiles: systematic and morphological diversity, physiological, reproductive and behavioral adaptations, ecology, and evolution. Required field trips to representative local habitats. (4 cr) *Last offered: Spring 2001, Spring 1999, Spring 1997, Spring 1995.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).
- BIO 3595 General Microbiology** Bacteria, viruses, eukaryotic microbes, immune function. Microbes in air, water, soil: interactions with plants and animals. Agricultural, commercial, industrial, and medical applications. Laboratory studies in growth and analysis of selected organisms/viruses. (4 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).
- BIO 3605 Microtechnique** The principles and basic methods of preparing specimens for microscopic study; major techniques and recent developments. (4 cr) Prerequisites: BIO 2105 and BIO 2106.
- BIO 3651 Non-vascular Plants** Physiology, comparative evolutionary trends, ecology, and morphology of Monera, photosynthetic Protists, Bryophytes, Fungi, and Lichens. (2 cr) *Last offered: Spring 1997, Spring 1996, Spring 1995.* Prerequisites: BIO 2105 and BIO 2106.
- BIO 3652 Non-vascular Plants Lab** Physiological experimentation and microscopic study of Monera, photosynthetic Protists, Bryophytes, Fungi, and Lichens. (2 cr) *Last offered: Spring 1997, Spring 1996, Spring 1995.* Prerequisites: BIO 2105 and BIO 2106.
- BIO 3755 Parasitology** Biology of host-parasite relationships with emphasis on parasites of man and domestic animals. Methods of transmission, host response to parasites, prevention and treatment. (4 cr) *Last offered: Fall 1998, Spring 1997, Spring 1995.*
Prerequisites: BIO 2105 and BIO 2106.
- BIO 3801 Plant Physiology** Physiology and metabolism of plants: photosynthesis, respiration, hormones, photoperiodism, radioisotopes in biological research, DNA biosynthesis and metabolism during plant development. (2 cr) *Last offered: Spring 1997, Spring 1996, Spring 1995.* Prerequisites: BIO 2105 and BIO 2106.
- BIO 3802 Plant Physiology Lab** Photosynthesis, respiration, hormones, extraction and characterization of DNA, DNA biosynthesis, autoradiographic techniques and liquid scintillation spectrometry. (2 cr) *Last offered: Spring 1997, Spring 1996, Spring 1995.*
Prerequisites: BIO 2105 and BIO 2106. Corequisites: BIO 3801.
- BIO 3905 Vascular Plants** Organization of the vascular plant body, plant reproduction and development, systematic and environmental considerations, tissue culture and hormonal regulation. (4 cr) *Last offered: Fall 2000, Fall 1998, Fall 1997, Fall 1996.*
Prerequisites: BIO 2105 and BIO 2106.
- BIO 4105 Bacterial Pathogens** The nature and activities of bacterial pathogens. Mechanisms of pathogenesis and invasiveness, and the physical evidence of infection and defense mechanisms of the host. Laboratory focus on isolation and identification methods and cultivation techniques. (4 cr) *Last offered: Spring 2001, Spring 2000.* Prerequisites: BIO 3595.
- BIO 4205 Cell Biology** The mechanisms of cell signaling, regulation of growth and division, adhesion, movement, macromolecular biosynthesis, processing and trafficking. Important experimental techniques and strategies for study of the eukaryotic cell. (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: BIO 3351 and CHM 2211 and CHM 2212.
- BIO 4251 Comp Endocrinology** Mechanisms of endocrine control of growth, metabolism, reproduction, adaptation, and behavior. The endocrine glands. (3 cr) *Last offered: Spring 2001, Summer 2000, Spring 2000, Spring 1999.* Prerequisites: BIO 3055.
- BIO 4252 Comp Endocrinology Lab** Laboratory experience in endocrinology, demonstrative and analytical. (1 cr) *Last offered: Spring 2001, Summer 2000, Spring 2000, Spring 1999.* Prerequisites: BIO 3055. Corequisites: BIO 4251.
- BIO 4285 Developmental Biology** Mechanisms and patterns of vertebrate embryo development from primordial germ cells to formation of organ systems. Lectures on, and laboratory work with living embryos; microscopic study of prepared embryos; and individual research projects. Prerequisite: BIO 3351 (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: BIO 3351.
- BIO 4305 Evolution** Process and pattern from micro- and macro-evolutionary perspectives. Evolutionary genetics, natural selection, speciation, macroevolutionary trends, and extinctions. Field, laboratory, and computer approaches. (4 cr) *Last offered: Spring 2001, Spring 1999, Spring 1998, Spring 1997.* Prerequisites: BIO 3351.
- BIO 4355 Experimental Genetics** Laboratory exploration and discussion of topics in bacterial, developmental, molecular, population and transmission genetics. Readings in the primary literature are stressed. (4 cr) Prereq: BIO 3351; MAT 1310-1315. (4 cr) *Last offered: Spring 2001, Spring 1999, Spring 1997.* Prerequisites: BIO 3351.

BIO 4451 Field Ecol and Evol Advanced study of organisms and ecosystems of a particular region (location varies; has included Florida, Puerto Rico, Nova Scotia). General principles explored using examples from focal area: historical and ecological biogeography, habitat patterns, biotic and abiotic interaction, evolutionary processes, and conservation problems. (2 cr) *Last offered: Summer 2001, Spring 2000, Spring 1998, Spring 1996.* Prerequisites: BIO 3012 or BIO 3255 or BIO 4305.

BIO 4452 Field Ecol and Evol Lab Field study of organisms and ecosystems of a focal region. Trip lasting 15-20 days usually in late May to geographical area covered in BIO 4451, with focus on local habitats and conservations projects, field identification, group exercises, and independent research projects. Costs to students and timing vary with site chosen. (2 cr) Sem 2, even year. Prereq: BIO 2105, 2106. Coreq: Bio 4451. (2 cr) *Last offered: Summer 2001, Spring 2000, Spring 1998, Spring 1996.* Prerequisites: BIO 3012 or BIO 3255 or BIO 4305. Corequisites: BIO 4451.

BIO 4485 Marine Biology An introduction to chemical, physical and geological oceanography; the biology and ecology of marine organisms (plankton, seaweeds, invertebrates, fishes, sea birds, marine mammals); and the comparative ecology of marine communities and ecosystems (estuaries, rocky intertidal, kelp forests, coral reefs, the deep sea and hydrothermal vents). Open to all majors. (4 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1996.*

BIO 4505 Molecular Biology DNA structure, replication, recombination, mutagenesis and repair, transcription, RNA processing, translation and the genetic code, control of gene expression, eukaryotic genome structure. Molecular aspects of immunity, cancer, and AIDS. Laboratory exercises in gene cloning and analysis. (4 cr) *Last offered: Spring 2001, Spring 2000, Fall 1998, Spring 1998.* Prerequisites: BIO 3351 and CHM 2211 and CHM 2212.

BIO 4605 Neurobiology The physiology of the nervous system using vertebrates and invertebrates. The function of nerve cells, synapses, sensory, motor, behavior and learning. (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: BIO 3055.

BIO 5100 Senior Seminar Special topics in modern biology, presented by student lectures and informal discussions. Topics to be announced each semester. (1 cr) *Restriction: Restricted to BIO Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Summer 2000.*

BIO 6100 Affiliation Study (0 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

BIO 6401 Independent Study Supervised laboratory/field research (1 cr)

BIO 6402 Independent Study Supervised laboratory/field research. (1 cr)

BIO 6403 Independent Study Supervised laboratory/field research. (1 cr)

BIO 6404 Independent Study Supervised laboratory/field research. (1 cr)

BIO 6409 Senior Thesis Directed laboratory research. Students will conduct original research and submit a written thesis. (2 cr) *Restriction: Restricted to BIO Majors. Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.* Prerequisites: or HON 1075) and (BIO 2106 or HON 1076)(BIO 2105. Corequisites: BIO 5100.

BIO 6509 Directed Research Library and/or laboratory research under thesis. (2 cr) Sem 1&2. Prereq: Bio the direction of a student-selected Biology faculty member. Prerequisite for senior. 2105, 2106; consent of mentor; 3.0 QPA. Restricted to junior or senior biology majors. (No substitution for required biology laboratory courses.) (2 cr) *Restriction: Restricted to BIO Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: (BIO 2105 or HON 1075) and (BIO 2106 or HON 1076).

BIO 6940 Special topics Current topics in biology. Topics will be announced on a semester by semester basis. Specific information will be available in the department office. (2 cr) *Last offered: Spring 1999, Spring 1996.*

BL 1090 Legal Environ Bus & Soc The sources, nature and substantive principles of American Law; its moral and ethical dimensions; the judicial process; comparison with other legal systems; impact of government regulations. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

BL 2100 Labor Legislation Modern legislation governing activities of employers and unions in labor disputes and relations between unions and their members; comparison with labor legislation internationally. (3 cr)

BL 2135 Bus Assoc & Commerc Tran The law of agency, partnerships and corporations; personal property; the Uniform Commercial Code sections dealing with secured transactions and negotiable instruments; moral and ethical dimensions; comparison with other legal systems. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

BL 2150 Real Estate Princes Pracs Ownership, possession and management of land and buildings; landlord and tenant, transfer of rights; title insurance; moral and ethical dimensions; comparison with other legal systems. (3 cr) *Last offered: Fall 1995, Spring 1995.*

BL 2160 International Business Law The nature, sources, functions and practical applications of International Law, approached from a perspective of the individual, governments, and business entities. Emphasis on the "rules" that govern doing business globally and resolving disputes. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1997, Fall 1996.*

BL 2185 Law of Contracts & Sales Elements for legal agreements; Uniform Commercial Code Article 2; moral and ethical dimensions; comparison with other legal systems. (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

BL 3160 Estate Planning Emphasis is placed on the use of estate planning principles in establishing estate objectives and plans, and the development of a faculty for using the tools of estate planning; moral and ethical dimensions. (3 cr)

BL 3190 Indep Study & Research Study with faculty member's guidance in an area of special interest to students. (3 cr) *Last offered: Fall 2000, Fall 1999.*

BL 5701 Alternate Dispute Resolution The nature of conflict and the means of effectively resolving disputes: litigation, negotiation, mediation, and arbitration. (3 cr) *Last offered: Spring 2001.*

BUS 1102 Integrated Prin Fin & Fin Acct The theory and techniques of financial management integrated with the fundamentals of financial accounting. Exposure to appropriate legal topics is included. (4 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.* Corequisites: BUS 1103, BUS 1104, BUS 1105, VBIL 1001.

BUS 1103 Integrated Prin Mkt & Mgmt Description and evaluation of the ways in which goods and services are developed to meet consumer needs and distributed for domestic and international consumption, integrated with the introduction to organizational structures, functions and management processes. Exposure to appropriate legal topics is included. (4 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.* Corequisites: BUS 1102, BUS 1104, BUS 1105, VBIL 1001.

BUS 1104 Integrated Prin Acctg & Op Mgt Introduction to issues related to the design of effective managerial accounting systems, integrated with the concepts and techniques for solving problems in manufacturing and service organizations. Exposure to appropriate legal topics is included. (4 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.* Corequisites: BUS 1102, BUS 1103, BUS 1105, VBIL 1001.

BUS 1105 Integrated Prin Mic & Mac Econ The economic system and its fundamental principles, integrated with discussion of the price system, demand & supply analysis, the production process and the analysis of market structures. Exposure to appropriate legal topics is included. (4 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.* Corequisites: BUS 1102, BUS 1103, BUS 1104, VBIL 1001.

BUS 1106 Integrated Bus Simulation Internet based computer simulation that seeks to provide students with hands-on experience in managing a company. (1 cr) *Last offered: Summer 2001, Summer 2000.*

CEE 2101 Egr Mechanics I- Statics Vector analysis of force systems on particles and rigid bodies with particular emphasis on mathematical and physical formulation of principles underlying the solution of engineering problems; vector algebra; friction; centroids and moments of inertia. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: MAT 1505 and PHY 2400.

CEE 2102 Egr Mechanic II-Dynamics Kinematic and kinetic analysis of particles and rigid bodies using vector calculus; work and energy; impulse and momentum. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: CEE 2101.

CEE 2103 Mechanics of Solids Stress resultants in bodies from tension, compression, shear, flexure, torsion and temperature stress and strain transformations; combined stresses; load deformation relationships; Euler buckling. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: CEE 2101.

CEE 2602 Civil Egr Measurements Two major group projects: environmental study of local stream and test model of bridge truss; "as needed" topics include map skills, photo interpretation, plane surveying, water quality, stream hydraulics, material properties and testing, beam flexure; field trips. Two lecture periods and one laboratory period a week. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: PHY 2400 (may be taken concurrently) and CEE 2101.

CEE 2702 Probability in CE Design Data reduction techniques, fundamental probability theory, analytical models, resampling techniques and simulation applied to problems in civil engineering. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

CEE 3101 Soil Mechanics Properties of soil as an engineering material, stresses in soil masses, slope stability, consolidation and settlement, bearing capacity, seepage and soil stabilization. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 2103 and GLY 2805. Corequisites: CEE 3901.

CEE 3111 Fluid Mechanics Fluid properties; fluid statics; kinematics of flow; conservation of mass, energy, momentum; dynamic similarity; fluid resistance, boundary layer theory; flow in conduits; lift and drag; potential flow; compressible flow. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: CEE 2102 and MAT 2500.

CEE 3211 Transportation Egr Transportation planning; system modes and roles of government agencies. Facility design: alignment, geometrics, pavement, economic evaluation of alternatives. Operations: capacity, level of service, traffic control, queuing, safety. Rail, air, public and future modes of transportation. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CEE 2102 and CEE 2602.

CEE 3224 Trans Facilities Design (CEE Design Elective) Systems engineering application of the planning/design process including conceptual design philosophies, environmental impact evaluations, design of highway and transit facilities. Communication processes

and software applications stressed. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 3211. Corequisites: CEE 3924.

CEE 3401 Structural Mechanics Concepts of stability and determinacy; moment area, conjugate beam and energy principles; indeterminate analysis by method of consistent deformation, slope deflection, moment distribution. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Summer 1999.* Prerequisites: CEE 2103.

CEE 3422 Structural Design (CEE Design Elective) Principles of design; limit state design logic and procedures; behavior and design of reinforced concrete and structural steel members; design for tension, compression, shear, and moment; serviceability; design for multiple constraints. Three lecture periods and one analysis-design period a week. (4 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 2702 and CEE 3401.

CEE 3501 Environmental Egr I Fundamental physical/chemical principles for environmental remediation; environmental regulations; water pollution, dissolved oxygen modeling, computer applications; solid and hazardous waste generation and management; toxicology and risk assessment. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHM 1152 and MAT 2500.

CEE 3511 Hydraulic Engr & Hydrol Pressure conduits, water and wastewater transport, pumping; open channel flow, hydraulic structures; principles of hydrology. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 2702 and CEE 3111.

CEE 3704 CE Numerical & Stat Analysis Development and application of algorithms for civil engineering problems. Numerical methods for root finding, simultaneous equations, curve fitting, interpolation, integration, and differentiation are covered. Students are introduced to fundamental probability theory and statistics. (3 cr) Prerequisites: EGR 1611.

CEE 3901 Soil Mechanics Lab Soil classification; techniques for determining properties of soil and soil aggregate; case histories in geotechnical engineering. One period a week. (1 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Corequisites: CEE 3101.

CEE 3911 Fluid Mechanics Laboratory Experiments and demonstrations illustrating principles of flow behavior including computer-aided analysis and interpretation. One period a week. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: CEE 3111.

CEE 3924 Trans Facilities Dsg Lab (CEE Design Elective) Design making under uncertainty; problems related to geometric design, highway and intersection capacity and site planning; route location and feasibility study. Software applications. One analysis-design period a week. (1 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Corequisites: CEE 3224.

CEE 4225 Advanced Trans Egr (CEE Elective) Applications of statistics and probability theory to solution of urban and rural transportations problems and the design of systems with software applications and model development. (3 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997.* Prerequisites: CEE 3211.

CEE 4423 Computer-aided Struct Egr (CEE Elective) Advanced structural analysis techniques; advanced topics in structural design; matrix formulations, structural modeling and design using commercial software packages. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 3401.

CEE 4522 Environmental Egr II (CEE Design Elective) Water quality problems and eutrophication; Clean Water and Safe Drinking Water Act; analysis and design of unit processes in water and wastewater treatment plants including sedimentation, coagulation and flocculation, adsorption, filtration, disinfection, activated sludge and trickling filters. Permission of Instructor is required if prerequisites have not been fulfilled. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CEE 3111 and CEE 3501. Corequisites: CEE 4922.

CEE 4523 Water Resources Engr Design (CEE Design Elective) Design fundamentals of hydrology and open channel hydraulics using production-level programs. Topics include design storms, storm water design and open-channel river modeling. Three lecture periods and one analysis-design period a week. (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CEE 3511 and CEE 3702.

CEE 4605 Civil Egr Design Project I (CEE Design Elective) The principles and techniques of civil engineering design; project planning and proposals; information gathering, storage, organization and retrieval; scheduling; technical writing. Oral Presentations. Prerequisite or corequisite: One CEE design elective. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

CEE 4606 Civil Egr Design Project II The completion, and final written report on approved design projects. Prerequisites: Two CEE design electives. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 4605.

CEE 4607 Selected Topics in CEE Independent study or research on a current engineering topic. Prerequisite: Senior standing and permission of the chairperson. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Summer 1998.*

CEE 4701 Economy and Risk Value theory, interest formulas, equivalence calculations, inflation and taxes, comparison among alternatives; decision criteria, risk and uncertainty. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CEE 3704.

CEE 4723 Modeling of Civil System (CEE Elective) Modeling and decision making techniques applied to specific infrastructure problems; statistics, simulation, reliability analysis and optimization. (3 cr) *Last offered: Spring 1999, Spring 1996, Spring 1995.*
Prerequisites: CEE 3702.

CEE 4821 Geological Engineering (CEE Design Elective) Soil testing, site investigation, design of both, shallow and deep foundations. Three lecture periods and one analysis-design period a week. (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CEE 3101 and CEE 3111.

CEE 4922 Environmental Egr Lab (CEE Design Elective) Physical, chemical, and microbiological analyses of water and wastewater; quantitative analysis of several unit operations and processes for water and wastewater treatment plants design and control; field trips to water and wastewater processing facilities. One period a week. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: CEE 4522.

CEE 5602 Architec & Egr Bldg Dsgn (Free CEE Elective) Role and relation between the architect and engineer in the design of buildings using real world building design applications; architectural design requirements; relation of engineering systems to building design. Prerequisite: Senior standing. (3 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997.*

CESL 6002 English As A Second Language English As A Second Language (2 cr) *Last offered: Spring 2002, Fall 2001, Summer 2001, Spring 2001.*

CGS 5900 Cognitive Science Seminar Interdisciplinary seminar focusing on theories, methods, and applications related to the study of intelligent systems. (3 cr) *Last offered: Spring 2001.*

CHE 2032 Chem Engr Thermo I Thermodynamics of single component systems: applications of first and second laws, steady-state energy balances, equations of state, thermodynamic properties of fluids, thermochemistry. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHE 2041.

CHE 2041 Chem Process Calculat Application of physical and chemical principles to the solution of steady-state material balances. (4 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: (CHM 1152 and EGR 1611 and MAT 1505 and CHM 3411 (may be taken concurrently)).

CHE 2232 Fluid Flow Operations Fluid statics, fluid properties, flow of incompressible fluids in conduits, friction factors, meters, pumps, external flow, drag, flow in packed and fluidized beds. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHE 2041.

CHE 2432 Modeling & Numerical Methods I Application of rate laws and conservation equations to modeling by differential equations of physical systems. numerical methods related to solution of system models involving algebraic equations and ordinary differential equations. Errors, stability and convergence. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999.*

CHE 2811 Professional Development I Introduction to professionalism: Engineering ethics; safety; professional responsibility; environmental responsibility. (1 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999.*

CHE 3031 Heat Transfer Operations Principles of heat flow, mechanisms of conduction, convection and radiation, correlations for heat transfer coefficients, heat transfer equipment and process applications. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: (CHE 2032 and CHE 2232).

CHE 3032 Principles of Mass Transfer Fundamentals of interphase mass transfer: mechanisms, driving force and resistance to transfer, design and analysis of continuous and staged contacting processes, gas absorption and stripping, binary distillation, liquid extraction. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: (CHE 3031 and CHE 3131).

CHE 3131 CHE Thermodynamics II The fundamental property relation, thermodynamic properties of single and multiple pure phases, homogeneous multicomponent phases, ideal and non-ideal liquid solutions, phase equilibria, chemical reaction equilibria, problem solving techniques, applications. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CHE 2032.

CHE 3132 Chemical Engineering Economics Methods of economic evaluation and decision making, applied to engineering problems. Cost estimation and indexing, time value of money, depreciation, comparison of alternatives. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999.*

CHE 3231 Modeling, Numerical Methods II Application of conservation equations to the development of dynamic models of chemical engineering processes, analysis of system models using analytical and numerical methods. Introduction to systems described by partial differential equations and their solution by numerical methods. (3 cr) *Last offered: Spring 2001, Spring 2000.*
Prerequisites: CHE 2432.

CHE 3232 Simulation and Control Introduction to process control concepts and applications, computer simulation of processes during transient change, real-time and LaPlace domain analysis of controlled systems. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHE 3131 and CHE 2432.

CHE 3821 Professional Development II Professionalism: Oral and written communication; experimentation, data handling, elementary statistical analysis; lab safety; professional portfolio. (2 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999.* Prerequisites: (CHE 2811 and CHE 3911 (may be taken concurrently)).

CHE 3822 Professional Development III Professionalism: Systematic safety analyses, hazard identification, fault-free analysis, redundant control; data handling; design of experiments; career issues; professional portfolio. (2 cr) *Last offered: Spring 2001, Spring 2000.* Prerequisites: (CHE 3821 and CHE 3922 (may be taken concurrently)).

CHE 3911 Chem Eng Laboratory I Illustration of chemical engineering principles using laboratory and pilot scale equipment. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999.*

CHE 3922 Chem Eng Laboratory II Continuation of CHE 3921. (2 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: (CHE 3921 and CHE 3032 (may be taken concurrently) and CHE 3232 (may be taken concurrently) and CHE 3822 (may be taken concurrently)).

CHE 4031 Chem Reaction Engineering I Principles and methods of chemical kinetics and reactor design, applied to homogeneous reactive systems of industrial importance. Stoichiometry and rate laws for simple and complex reactions, analysis of reaction rates, isothermal reactors, introduction to temperature effects. Team design of integrated reactor system. (3 cr) *Last offered: Fall 2001, Fall 2000.* Prerequisites: CHE 3131 and CHE 3031. Corequisites: CHE 4131.

CHE 4131 Process Design I Application of fundamental principles of chemical engineering to design of industrial chemical processes; use of process simulators (such as AspenTech ASPEN PLUS) for process design. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: (CHE 3032 and CHE 3232 and CHE 4031 (may be taken concurrently)).

CHE 4821 Professional Development IV Professionalism: Lifelong professional development; independently researched seminar; inherently safe design practices; professional portfolio. (2 cr) *Last offered: Fall 2001, Fall 2000.* Prerequisites: CHE 3822.

CHE 4831 Chem Engr Projects I Independent investigation of a chemical engineering problem, under supervision of a faculty adviser, including a written comprehensive report. (Nine hours per week of independent study). (3 cr) *Restriction: Restricted to CHE Majors. Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

CHE 4832 Chem Engr Projects II Continuation of CHE 4831. May include further investigation of same problem or a different topic. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Summer 2000.* Prerequisites: CHE 4831.

CHE 4921 Chem Eng Laboratory III Continuation of CHE 3922, extended experimental investigations. (2 cr) *Last offered: Fall 2001, Fall 2000.* Prerequisites: CHE 3922.

CHE 5001 Industrial Liq & Sld Waste Industrial waste management: nature and sources of waste streams, principles underlying chemical and physical treatment methods, case studies of treatment technology. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Spring 1998.*

CHE 5002 Prin of Air Pol Control Causes, effects and control of air pollution, emphasizing fundamental mechanisms: pollutant generation, atmospheric dispersion, sampling/analysis and data interpretation, air pollution control technology. (3 cr) *Last offered: Fall 2000, Spring 2000, Spring 1999, Spring 1997.*

CHE 5032 Process Equip Design II Continuation of CHE 4131, with emphasis on equipment design; use of process simulators (such as AspenTech ASPEN PLUS) for process equipment design. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1998, Spring 1997.* Prerequisites: CHE 4131.

CHE 5132 Transport Phenomena Unified study of heat, mass and momentum transport: underlying physical laws, mathematical representation of transport laws, analogies between different transport modes, estimation of transport properties, applications. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 1999, Spring 1998.* Prerequisites: CHE 3032.

CHE 5232 Chem Reaction Eng II Principles and methods of chemical kinetics and reactor design applied to heterogeneous reactive systems of industrial importance: catalysis and catalytic reactors, catalyst deactivation, diffusion effects, design of heterogeneous catalytic and non-catalytic chemical reactors. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHE 4131.

CHE 5331 Process Control Theory Mathematical tools for control systems analysis: linear open- and closed-loop systems, frequency response techniques, multi-variable process control, sampled-data control techniques, other advanced topics. (3 cr) *Last offered: Fall 1998, Fall 1997, Fall 1996, Fall 1995.* Prerequisites: CHE 3232.

CHE 5332 Special Topics in CHE Selected topics in chemical engineering: recent developments, new technology, applications of other disciplines to chemical engineering problems. (3 cr) *Restriction: Restricted to CHE Majors. Last offered: Fall 2000, Spring 1997.*

CHE 5532 Intro to Biotechnology Production of commercially useful materials by living organisms, emphasizing emerging technology: biologically important compounds, their relationships to genetics and metabolic pathways, controlled growth of microbes, separation and purification of products. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 1999, Spring 1997.*

CHE 5632 Polymer Sci and Engr Basic principles of polymer science: nature and structure of organic high-polymers, polymerization reactions, physical and chemical properties, mechanical testing, viscoelasticity, flow and processing applications. (3 cr) *Last offered: Spring 2001, Fall 2000, Fall 1999, Spring 1999.* Prerequisites: (CHE 2212 or CHM 3212).

CHI 1111 Basic Chinese I Functional use of Chinese for students with no prior knowledge of Chinese. New pronunciation system, PINYIN, readings and oral drills. Supplementary language laboratory work. (6 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

CHI 1112 Basic Chinese II Continuation of CHI 1111-Basic Chinese I New pronunciation system, PINYIN, readings and oral drills. Supplementary language laboratory work. (6 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

CHI 1121 Intermediate Chinese I Review of Grammar and vocabulary. New pronunciation system, PINYIN, reading and oral drills. Supplementary language laboratory work. (5 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

CHI 1122 Intermediate Chinese II Review of grammar and vocabulary. New pronunciation system, PINYIN, readings and oral drills. Supplementary language laboratory work. (5 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

CHI 1131 Advanced Chinese I Advanced communication skills including reading and discussing topics on current events. Supplementary language laboratory work. (3 cr)

CHI 1132 Advanced Chinese II Advanced communication skills including reading and discussing topics on current events. Supplementary language laboratory work. (3 cr)

CHI 2143 Chinese Culture Chinese culture and civilization from the beginning to the present. Conducted in English. Satisfies Diversity Requirement. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

CHI 2144 Chi Lit in Translation The history and development of Chinese fiction from its beginning to the present. Conducted in English. Satisfies Diversity Requirement and advanced English literature elective course. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

CHM 1000 Profesl Development Sem These courses taken by all chemistry majors each semester with presentations on the chemical profession by students, faculty and visiting chemical professionals. A broad range of activities will include presentations on undergraduate research, career planning, the chemical industry, chemical safety and such topics as medicinal chemistry, polymer chemistry, pharmacology, etc. (1 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

CHM 1001 Experimental Chem I Simple syntheses and quantitative measurements; analysis of materials and separations. Some experience with modern instrumentation will be provided to demonstrate the limitations accompanying the experimental method. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Spring 1999.* Corequisites: CHM 1050.

CHM 1002 Experimental Chem II This laboratory experience will continue to extend the student's knowledge of chemistry as an experimental science. (1 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHM 1001.

CHM 1050 Chem Themes Foundation For non-science majors. Basic concepts of measurement, the S. I. system of units, structure of atoms and molecules, inorganiz nomenclature, qualitative and quantitative aspects of chemical reaction, properties of gases, properties of solutions, principles of chemical equilibrium, acids and bases. The first semester in a two-semester sequence. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHM 1051 Chemistry & Energy For non-science majors. The role of chemistry in the production, storage and utilization of energy. Topics covered include basic thermochemistry, thermodynamics, organic chemistry, energy from combustion, electrochemistry, electrochemical energy production, nuclear chemistry, and other sources of energy (phase changes, wind and water power, solar energy, tidal power). (3 cr) *Last offered: Spring 1999.* Corequisites: CHM 1002.

CHM 1052 Organic and Biochemistry For non-science majors. Introduction to alkanes, alkenes, arenes, amines, carboxylic acids, amino acids, carbohydrates, proteins and major metabolic pathways. Also includes topics in nutrition and exercise. Prereq: CHM 1050, 1000; Coreq: CHM 1002. (3 cr) *Last offered: Spring 2001, Spring 1999.*

CHM 1053 Atoms Elements Molecules For non-science majors. The experiments which led to the the inception and evolution of the concepts of atoms, elements, and molecules will be examined. These samples give a grounding in the fundamentals of chemistry and an understanding of the logic which underlies the "scientific method". Coreq: CHM 1002. (3 cr) *Last offered: Spring 1997.* Corequisites: CHM 1002.

CHM 1054 Environmental Chemistry For non-science majors. Application of scientific laws, principles, and concepts to a basic understanding of the chemistry of the environment its use and abuse, as it is affected by the quality of the air, water and soil; and the impact of the increasing demands for the earth's limited fossil, biological and mineral resources by an exponentially growing global population. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1997.* Corequisites: CHM 1002.

CHM 1055 Molecular Architecture For non-science majors. An historical development of the idea of three dimensional species at the molecular level; experimental verification, chiralspecies, electronically delocalized species, aromatic and anti-aromatic species, fluxional species, rigid, highly strained, unstable and metastable species. Current and future directions (e.g. "Buckyballs") as time allows. (3 cr) *Last offered: Spring 2000, Spring 1998.* Corequisites: CHM 1002.

CHM 1056 Supermarket Chemistry For non-science majors. The chemistry of products found in the supermarket: food processing, food additives, soaps and detergents, cosmetics, and over-the-counter pharmaceuticals. (3 cr) *Last offered: Spring 1998.* Corequisites: CHM 1002.

CHM 1103 General Chemistry Lab I Qualitative and quantitative laboratory experiments which include: the reactions of metals with water; the collection and plotting of data; acid-base titrations; oxidation-reduction titrations; the use of the pH meter and the determination of acid-base titration curves; the use of the spectrophotometer. (1 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHM 1104 General Chemistry Lab II Students will be required to identify all metal ions present in an unknown solution. Quantitative titrations of sodium carbonate and the total hardness of water. Synthesis of inorganic compounds and determination of the formula of a transition metal complex ion using spectroscopic methods. (1 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Corequisites: CHM 1152.

CHM 1108 General Chemistry Lab II Chemistry of organic and biochemical compounds with an emphasis on the identification and chemical reactivities of functional groups. Students will be required to separate and identify various organic and biochemical compounds. Open to health affiliation students. (1 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Corequisites: CHM 1134.

CHM 1131 General Chemistry I Fundamental laws and theories of chemistry: atomic theory, chemical bonding, chemical kinetics and chemical equilibrium, gases, liquids, solids, solutions, stoichiometry, acid-base theories, electrochemical concepts, and an introduction to nuclear chemistry will be included. Open to health affiliation students. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Corequisites: CHM 1103.

CHM 1134 General Chemistry II Introduction to organic and biochemistry stressing the application of principles developed in CHM 1131. Open to health affiliation students. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Corequisites: CHM 1108.

CHM 1151 General Chemistry I Basic concepts of chemistry covering the following topics: properties of bulk matter; stoichiometry; colligative properties of solutions; thermochemistry; redox reactions; equilibrium and kinetics. For science and engineering students. (4 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Corequisites: CHM 1103.

CHM 1152 General Chemistry II Descriptive presentation of atomic orbitals; molecular structure; chemical and physical trends in the periodic table; general descriptive chemistry of the elements; complex ions and factors that drive chemical reactions. For science and engineering students. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: CHM 1151.

CHM 1301 Inorganic Chemistry Lab I Selected experiments to illustrate fundamental laboratory techniques and skills. Qualitative and quantitative measurements, synthesis and characterization of inorganic complexes, literature searching and computer usage. Emphasis on modern research applications of metals and main group elements. For chemistry majors only. (2 cr) *Last offered: Fall 2001, Fall 2000.* Corequisites: CHM 1311.

CHM 1311 Inorganic Chemistry I Fundamental principles in inorganic chemistry stressing relationships among structure, bonding, and reactivity. Properties of matter, periodic trends, acid/base reactions, redox reactions, and bonding in transition metal complexes. For chemistry majors only. (3 cr) *Last offered: Fall 2001, Fall 2000.* Corequisites: CHM 1301.

CHM 1502 Quant Anal Lab Laboratory experiments to complement CHM 1512 covering the following: gravimetric analysis, acid-base titrations (weak acid; mixed acid), compleximetric titration and redox reactions. (2 cr) *Last offered: Spring 2001.* Prerequisites: CHM 1301. Corequisites: CHM 1512.

CHM 1512 Quantitative Analysis Chemical analysis, with emphasis upon statistical methods, acid-base properties, pH, equilibrium expressions, complexation equilibria, solubility properties, redox potentials, electrolysis, and electrochemical cells. (3 cr) *Last offered: Spring 2001.* Prerequisites: CHM 1311. Corequisites: CHM 1502.

CHM 1903 Internship Elective (3 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.*

CHM 1906 Internship Elective (6 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.*

CHM 1909 Internship Elective (9 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.*

CHM 2201 Organic Chemistry Lab I Practical experience in techniques used for separation, purification, and isolation of synthetic as well as naturally occurring organic compounds. Semi-micro and micro scale experiments. Crystallization, distillation, extraction, and chromatography are introduced. (1 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHM 2202 Organic Chemistry Lab II Further training in laboratory techniques used in organic chemistry, including those introduced in CHM 2201, and utilization of such techniques in representative types of organic reactions. Semi-micro and micro scale experiments. (1 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Corequisites: CHM 2212.

CHM 2211 Organic Chemistry I Fundamental principles of organic chemistry stressing the relation of structure and reactivity. Structure and bonding; stereochemistry; acids, and bases; electrophilic addition, elimination and nucleophilic substitution. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Corequisites: CHM 2201.

CHM 2212 Organic Chemistry II Continuation of CHM 2211. Carbonyl group reactions, aromatic chemistry, spectroscopy and special topics such as heterocycles, carbohydrates and nucleosides, amino acids and proteins, lipids, radicals, rearrangements,

polymers and photochemistry. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: CHM 2211 and CHM 2201. Corequisites: CHM 2202.

CHM 2993 Internship (3 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Summer 1999.*

CHM 2996 Internship (6 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Summer 1999.*

CHM 3002 Chemical Lit and Res A writing intensive course with training in the use of the chemical literature, in performing searches in Chemical Abstracts, in computer searches, in writing reports, research papers, grant proposals, and abstracts. One written report will also serve as the basis for an oral presentation. (3 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Spring 1999.*

CHM 3201 Organic Chemistry Lab I Provides practical experience in the principal techniques utilized for the purification, separation, identification, and synthesis of organic compounds on the micro scale. Open to Chemistry majors. (2 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CHM 1502. Corequisites: CHM 3211.

CHM 3202 Organic Chemistry Lab II The semi-micro techniques include distillation, recrystallization, extraction, sublimation, and chromatography. Synthesis of representative organic compounds. An introduction to research in organic chemistry, introduction to qualitative organic analysis and practical use of infrared and nuclear magnetic resonance spectroscopies. (2 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Corequisites: CHM 3212.

CHM 3211 Organic Chemistry I Fundamental principles of organic chemistry stressing the relation of structure and reactivity from a physical-chemical viewpoint. Structure and bonding; stereochemistry; acids and bases; electrophilic addition reactions of alkenes, alkynes, and dienes; nucleophilic substitution reactions at saturated carbon atoms and elimination reactions leading to alkenes or alkynes. Open to chemistry majors. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CHM 1512 and CHM 1502. Corequisites: CHM 3201.

CHM 3212 Organic Chemistry II Addition and substitution reactions of carbonyl compounds, electrophilic and nucleophilic aromatic substitutions, radical and concerted reactions, heterocyclic compounds and polymer chemistry. Spectroscopic methods of analysis including nuclear magnetic resonance, infrared spectroscopies and mass spectrometry. Introduction to multi-step organic synthesis. Open to chemistry majors. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHM 3211 and CHM 3201. Corequisites: CHM 3202.

CHM 3301 Inorganic Chem Lab II This laboratory course emphasizes preparative techniques of inorganic compounds. Instrumental methods of structure elucidation are included. (2 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: (CHM 2212 and CHM 2202) or (CHM 3212 and CHM 3202). Corequisites: CHM 3312.

CHM 3312 Descript Inorganic Chem Emphasis on practical aspects of chemical and industrial processes including recovery and refining of elements and their compounds. The periodic relationship of elements will be studied along with structure, bonding and stereochemistry of inorganic chemicals. Acid-base theory and coordination chemistry will also be covered. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: (CHM 2212 and CHM 2202) or (CHM 3212 and CHM 3202). Corequisites: CHM 3301.

CHM 3401 Physical Chem Lab I Use of the computer to design statistical package software for treatment of experimental data will be stressed in the two semester laboratory course. Phase and chemical equilibrium to supplement CHM. 3411 will be included. Gas chromatographic techniques will be used. (1 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.* Corequisites: CHM 3411.

CHM 3402 Physical Chem Lab II Experimental methods of chemical kinetics will be covered. Spectroscopic, polarimetric, and conductimetric methods will be used. (1 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: CHM 3401 and CHM 3411. Corequisites: CHM 3412.

CHM 3411 Physical Chemistry I First, second, and third laws of thermodynamics; phase equilibria and chemical equilibria; gases; and electrochemistry will be covered in this course. (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.* Prerequisites: CHM 1152 and MAT 1505 and CHM 3401 (may be taken concurrently).

CHM 3412 Physical Chemistry II The course will present an introduction to atomic and molecular structure and spectroscopy. The knowledge attained in these topics will be used to present the topics of chemical kinetics and chemical dynamics from the molecular point of view. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: CHM 3411 and CHM 3401. Corequisites: CHM 3402.

CHM 3501 Instrumental Analysis Lab Laboratory techniques to obtain quantitative information about the composition of unknown samples, including potentiometric titration, spectrophotometry, chromatography, kinetic analysis, anodic stripping voltammetry, spectrofluorometry and atomic absorption spectrometry. Designed to complement CHM 3511 lecture. (2 cr) *Last offered: Fall 2001.* Prerequisites: CHM 1311. Corequisites: CHM 3511.

CHM 3503 Analytical Chem Lab Laboratory course to complement CHM. 3514; emphasis on the analysis of biological systems utilizing modern analytical techniques. Designed for the biochemistry concentration. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: CHM 3514.

CHM 3505 Analytical Chem Lab I Designed to complement CHM. 3515. Laboratory experiments involving gravimetric, titrimetric and spectrophotometric methods are used to obtain quantitative data about the composition of various samples. (2 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: CHM 3401, CHM 3411, CHM 3515.

CHM 3506 Analytical Chem Lab II A complementary course for CHM. 3516. Emphasis on instrumental techniques to obtain quantitative data. Techniques such as spectroscopy, spectrochemical titrations, electroanalytical techniques (electrode position, polarography, coulometry, etc.) and separation techniques (gas chromatography and liquid chromatography). (2 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHM 3505 and CHM 3515. Corequisites: CHM 3402, CHM 3412, CHM 3516.

CHM 3511 Instrumental Analysis The utilization of instruments covering the following topics: analog and digital signals, absorption and emission of light by molecules and atoms, chromatography (HPLC, GC) and detection, use of enzymes and antibodies, radioactivity, and chemometrics. (3 cr) *Last offered: Fall 2001.* Prerequisites: CHM 1311. Corequisites: CHM 3501.

CHM 3514 Analytical Chemistry Designed for the biochemistry concentration with emphasis on theory, instrumentation and practical applications of analytical chemistry to biological materials. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CHM 2212 or CHM 3212. Corequisites: CHM 3503.

CHM 3515 Analytical Chemistry I Fundamentals of modern analytical chemistry with emphasis on data collection and analysis, evaluation of error, extensive treatment of equilibria in simple and complex systems. Examination of gravimetric and titrimetric methods. Introduction to spectroscopy. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: CHM 3401, CHM 3411, CHM 3505.

CHM 3516 Analytical Chemistry II Quantitative instrumental analysis theory and its application to the analysis of common laboratory samples, environmental samples, and forensic samples. The application of reaction rates to analytical chemistry. Topics such as optical methods, electroanalytical techniques, and chromatographic techniques are stressed. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHM 3515 and CHM 3505. Corequisites: CHM 3506.

CHM 4202 Org Struct Analysis Lab Laboratory experiments involving separations by modern chromatographic techniques including thin layer, radial, flash, and high performance liquid chromatography. Multistep syntheses of organic compounds with experiments chosen from the chemical literature. Characterization of organic compounds by advanced spectroscopic methods. (2 cr) Corequisites: CHM 4222.

CHM 4222 Organic Struct Analysis Spectroscopic methodology for the determination of structure of static, as well as dynamic molecular systems. Proton and carbon-13 nuclear magnetic resonance spectroscopy, mass spectrometry, infrared, ultraviolet-visible, and optical rotatory dispersion-circular dichroism will also be presented. (3 cr) *Last offered: Spring 1999, Spring 1998, Spring 1997, Spring 1996.*

CHM 4413 Spectroscopy & Structure Use of the fundamental principles of atomic and molecular structure to study ultraviolet, infrared, microwave and magnetic resonance spectroscopies. Continuous-wave and Fourier transform methods will be included along with fluorescence, phosphorescence and laser spectroscopic techniques. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: CHM 3412 and (CHM 2212 or CHM 3212).

CHM 4601 Biochemistry Laboratory An introduction to laboratory techniques in biochemistry; enzyme kinetics, column chromatography, electrophoresis, standard biochemical assays and interpretation of data. (1 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Spring 1999.* Prerequisites: CHM 2212.

CHM 4603 Biochem Tech. and Pract. A laboratory course to complement CHM 4621 and 4622. Emphasis on enzyme purification, enzyme characterization, nucleic acid analysis, polysaccharide analysis and coupled enzyme systems. (2 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: (CHM 2212 or CHM 3212) and CHM 4621. Corequisites: CHM 4622.

CHM 4611 Intro Biochemistry Basic areas of biochemistry; carbohydrates, lipids, proteins, nucleic acids, enzymes, vitamins and hormones; consideration of their utilization and metabolism in living systems. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHM 4621 Biochemistry I An in depth study of the structure and function of the structure and function of proteins, enzymes, carbohydrates, nucleic acids and lipids. (3 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Spring 1999.*

CHM 4622 Biochemistry II Continuation of CHM 4621 with emphasis on the metabolic pathways of carbohydrates, fats, steroids, amino acids and nucleotides. Metabolic controls of the pathways is stressed. /tgree hours (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Corequisites: CHM 4603.

CHM 4623 Biochemistry III Integration of metabolism in organisms, membrane receptors expression of genes, gene manipulation, translation, transcription. Prereq: CHM 4622 (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CHM 4622.

CHM 4801 Research I Student participation in independent research under faculty supervision, frequent conferences with advisor on literature search, theoretical and experimental research (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHM 4802 Research II Continuation of CHM 4801. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHM 4803 Research III Continuation of CHM 4802. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Fall 1999.*

CHS 1000 Anc Med Renaiss Thought A Humanities seminar based principally on texts and readings drawn from primary sources up to 1650. Extensive written work and seminar discussions. Required readings: Hebrew and Christian scriptures, selections from the works of Augustine, Greek and Renaissance works. Readings from different genres and disciplines. Themes developed by the instructor in accordance with the selected readings. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CHS 1001 Mod Thgt:Enlight to Pres A Humanities seminar based principally on texts and readings drawn from primary sources 1650 to the present. Extensive written work and seminar discussions. Readings from each of the following five historical eras: Early Modern, Enlightenment, Romantic, Modernist, Contemporary. Readings will also reflect different genres and disciplines. Themes developed by the instructor in accordance with the selected readings, including a specific Augustinian theme. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

CJ 1000 Intr to Private Security Policies and procedures for special threats, institutional security systems, security issues, security challenges and the professionalization of private security. (3 cr) *Last offered: Fall 1998, Fall 1996, Fall 1995.*

CJ 2000 Institutional Security Policies, procedures and practices for the security of health, hotel, campus, museum, library and archival, cargo, bank, commercial, corporate, and retail operations. (3 cr) *Last offered: Spring 1996, Spring 1995.*

CJ 2300 Civil Liability (3 cr) *Last offered: Spring 1999, Fall 1995.*

CJ 2500 Private Security Invest (3 cr) *Last offered: Fall 1999, Spring 1997.*

CJ 3000 Intro to Victimology (3 cr) *Last offered: Fall 2001, Fall 2000.*

CJ 3500 Loss Prevention Priv Sec (3 cr) *Last offered: Spring 2000, Fall 1997.*

CJ 3700 Private Security & Terrorism The ramifications of terrorism, terrorist typologies and terrorist objectives, and the evaluative and protective strategies for individuals, property and environments requiring protection from terroristic activities are discussed. (3 cr) *Last offered: Spring 1998.*

CJ 3800 Priv Sec & Collect Behav (3 cr)

CJ 4000 Practicum Priv Security (3 cr)

CJ 4500 Priv Security Super Mgt (3 cr) Prerequisites: CJ 1000 and CJ 2300.

CLA 1005 Literacy and Latin (3 cr)

CLA 2021 Language of Science & Medicine Language of Science and Medicine Greek and Latin prefixes, roots, and suffixes in modern vocabulary; vocabulary building, with emphasis on technical terminology in scientific and medical usage. Knowledge of the languages is not required. (3 cr)

CLA 2032 Classical Mythology The myths, legends and folklore of the Greeks and Romans as they developed in their life, thought and literature; their influence on the Renaissance and modern times. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

CLA 2051 Cities of Ancient Greece Classical archaeology and architecture of Greece. Selected sites in the Greek world with emphasis on their architectural, artistic and history significance. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1996.*

CLA 2052 Rome: The Ancient City Classical archaeology and architecture of Italy. Selected sites in the Roman world with emphasis on their architectural, artistic and historical significance. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 2001, Fall 1997.*

CLA 3001 Independent Study Reading of selected material in Latin or Greek or in classical literature in translation under the direction of a member of the staff. Fulfills advanced literature requirements. (3 cr) *Last offered: Summer 2001, Spring 2001, Fall 2000, Summer 2000.*

CLA 3040 Studies in the Classics Selected themes of special interest. Topics vary according to interests of students and instructor: e.g. Women in the Classical World, Slavery in the Ancient World, Classical Rhetoric, etc. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Spring 1995.*

CLA 3052 Roman Law The origins, nature, and history of Roman Law during the Republic and Empire; evolution of the court system; civil and criminal codes; judicial procedure; social, business and economic institutions and the law; government and administration of the empire. Fulfills advanced literature requirements. (3 cr)

COM 1000 Surv of Communication Studies Process of communication; range of perspectives from which communication can be studied (from classical rhetoric to contemporary theory); the functions communication serves; and the forms of communication such as interpersonal, small group, organizational, public address, and mass media. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 1100 Public Speaking Principles of communication related to speech composition and delivery; finding, analyzing, organizing and presenting material in ways appropriate to and effective with diverse audiences. Does not fulfill C&F requirement. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 1101 Business & Prof Communication Communication strategies and skills for a variety of business professional settings. Combines public speaking and small group organizational communication, featuring individual and group presentations. Fulfills the Commerce and Finance requirement; not intended for Communication Department majors. (3 cr) *Restriction: Not Open to COM Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 1903 Communication Internship Supervised work/study program in radio, television, advertising, publicity or public relations. (3 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

COM 1906 Communication Internship Supervised work/study program in radio, television, advertising, publicity or public relations. (6 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

COM 1909 Communication Internship Supervised work/study program in radio, television, advertising, publicity or public relations. (9 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

COM 2000 Voice and Diction Improvement of vocal quality and articulation through study of vocal anatomy, phonetics, projection, and expressiveness. Emphasis on live and taped performances of readings. (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

COM 2050 Performance of Literature Solo and group performance of poetry, prose, and drama. Focus on rhetorical power of performed literature. Combines elements of theatre, literature and communication. (3 cr) *Last offered: Fall 2000, Fall 1999.*

COM 2150 Screenwriting Development of narrative strategies through improvisation and techniques of mediated visualization using video. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

COM 2210 Rhetoric and Public Discourse Rhetoric as the process of symbolic creation and recreation of community identity. Theory and history of rhetoric; applications to the study of politics, popular culture, speeches, media images, artistic works, advertising, and legal issues. (3 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Fall 1999.*

COM 2250 Argumentation and Debate Argumentation theory and practice, emphasizing the construction of well-reasoned arguments and attacks on and defense of arguments. Participation in a number of in-class debates. (3 cr) *Last offered: Spring 2001, Spring 2000.*

COM 2310 African American Rhetoric The symbolic construction of African American identity in the United States through an analysis of speeches, films, television and other media. (3 cr) *Last offered: Spring 2001, Spring 2000.*

COM 2410 Campus Newspaper Practicum Practical experience in running a professional newspaper, the Villanovan, including experience in news gathering, story development, editing, copy reading, layout, graphics and the business aspects of a newspaper - accounts, advertising and costs. (3 cr) *Last offered: Fall 2000, Spring 2000, Fall 1999. Prerequisites: ENG 2020.*

COM 2450 Media and Politics Examination of political communication research, theory and history. A particular focus on the role of media, such as advertising and news reporting, on political campaigns and policymaking. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999.*

COM 2510 Broadcast Performance Styles and techniques of broadcast journalism performance, including studio and location reporting and interviewing. Historical and contemporary trends in broadcast journalism explored. (3 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 2540 Rhet & Demo in Ancient Greece An upper-level course in which students study important ancient Greek rhetorical and philosophical texts and their influence on significant archaeological sites. THIS COURSE IS ONLY OFFERED IN THE SUMMER STUDY ABROAD IN GREECE PROGRAM. (3 cr) *Last offered: Summer 2001.*

COM 2550 Performance of Greek Lit Students analyze and perform both ancient and contemporary Greek literary texts; the performances, both solo and group are at Greek archaeological sites based on Greek oral traditions, poetry and drama, such as from Homer, Sappho, Antigone and Medea. THIS COURSE IS ONLY OFFERED IN THE SUMMER STUDY ABROAD IN GREECE PROGRAM. (3 cr) *Last offered: Summer 2001.*

COM 2950 Spec Top in Rhetoric & Perf Topic or problem in the Rhetoric & Performance area of communication selected by the instructor. (3 cr) *Last offered: Spring 2001.*

COM 2993 Communication Internship Supervised work/study program in radio, television, advertising, publicity or public relations. (3 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 2996 Communication Internship More intensive, in depth work/study/program in radio, television, advertising, publicity or public relations. (6 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 3000 Mass Communication Studies Structure and content of the major media industries in America (radio, television, film, newspapers, magazines, recordings, and books), and how each interacts with individuals, groups, and institutions. Students analyze

and critique media systems and content in terms of social, legal, political, and economics forces that influence them. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 3050 Public Relations Theories behind the practice of public relations as well as a working knowledge of public relations strategy planning. (3 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 3100 Advertising Strategies and techniques used in contemporary American advertising: consumer behavior, market research and analysis, message development for print and broadcast, and media selection. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 3150 Media Writing Develop professional writing skills through a series of assignments including public communication campaigns, commercials, and analysis of short dramatic pieces. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000.*

COM 3210 Television Production In-studio workshop that deals with basic television production techniques, including producing and directing short interview programs, news, demonstrations and short dramatic pieces. Discussion of current problems in the management and operation of a television broadcasting station. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 3250 Advanced Television Production Extends students' knowledge of basic television production; involves the writing, planning, and creation of varied formats of television programming, culminating in a semester project intended for broadcast or other media outlet. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000. Prerequisites: COM 3210.*

COM 3300 Programming for Radio & Telev Process of evaluation, selection and scheduling of programming for television, radio and cable. (3 cr)

COM 3310 Radio Broadcasting The history and principles of commercial radio broadcasting: programming, research, sales, promotions, broadcast engineering and federal regulations. Hands-on-audio production experience with broadcast equipment focusing on the art of audio production and development of public affairs radio program to air on WXVU. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000.*

COM 3350 Film Analysis Methods and perspectives used to analyze visual media drawing on contemporary and historically important films. Historical, theoretical, and aesthetic approaches to film analysis, as well as the social, political and economic forces that influence film content. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

COM 3400 Film History Evolution of film as an art form; includes the impact of technology. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999.*

COM 3450 International Cinema Study of the film of or about a particular country with emphasis on political, social, cultural and artistic issues. (3 cr)

COM 3510 Contemporary Cinema Seminar course in which various strategies are applied to the analysis of contemporary films. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.*

COM 3550 Film Genre Study Exploration of a particular genre's significance within film history and its reflection of contemporary political, social, and cultural issues. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

COM 3650 The Film Auteur Intensive chronological study of the work of one European or American film director. (3 cr) *Last offered: Fall 2000, Spring 2000.*

COM 3700 Women and Film Historical survey of American film from a feminist perspective. Study of American and foreign women directors. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Fall 1999.*

COM 3750 Families on Film Study of films which focus on the dynamics of family communication using the semiological, psychoanalytic, phenomenological and family communication theory approaches. (3 cr) *Last offered: Fall 2000, Fall 1999.*

COM 3800 Media Criticism Analysis of contemporary film, television, music, print media and electronic media from a cultural studies perspective. (3 cr)

COM 3950 Spec Top in Media & Film Topic or problem in the Media & Film area of Communication selected by the instructor. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001.*

COM 4000 Interpersonal Comm Studies Explores everyday communication between people across many contexts. Critical examination of the personal, social, and cultural dimensions of human relationships. Experiential activities augment lectures/discussions. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

COM 4050 Teambuilding & Small Group Com Theory and practice of communication for idea generation and problem-solving in groups, teams, and in other multiple contexts. (3 cr) *Last offered: Fall 2001, Fall 1999.*

COM 4100 Speech Comm in the Classroom Role of communication in the contemporary classroom; classroom skills of lecturing, discussing, demonstrating and oral reading; communication strategies to achieve classroom discipline. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999.*

- COM 4150 Gender and Communication** Communication of women and men against the backdrop of society and feminism in such communicative contexts as families, schools, friendships and relationships, organizations, media, and technology. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*
- COM 4200 Intercultural Communication** The impact on culture of communication styles, and practices. The role of communication in personal and professional intercultural relationships. (3 cr) *Last offered: Spring 2001, Spring 2000.*
- COM 4250 Organizational Communication** Role of communication in organizing; supervisory- subordinate relationships, group relationships, organizational culture and communication networks, communication technologies, communication based training and development, and human resource applications. (3 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Fall 1999.*
- COM 4300 Communication and Conflict** Communicative elements of conflict that arise out of personal and cultural differences in a variety of interpersonal interactions and relationships. Intergroup conflicts between dominant and minority groups also examined. (3 cr)
- COM 4950 Spec Top in Interpersonal Org** Topic or problem in the Interpersonal/Organizational area of communication selected by the instructor. (3 cr) *Last offered: Fall 2001, Spring 2001.*
- COM 5000 Communication Research** Reading and designing research in communication through gathering and critically analyzing literature in the field and introduction of the chief methods used in communication studies. (3 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- COM 5050 Senior Project** Design, implementation, and presentation of a group research project in which students apply the knowledge and skills learned through the Communication program of study to the investigation of rhetorical or communication phenomena. (3 cr) *Restriction: Restricted to COM Majors. Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
Prerequisites: COM 5000 or CA 5000.
- COM 5100 Directed Study** Supervised project culminating in term paper. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- COM 5150 Spec Top in Communication** A topic or problem in Communication selected by the instructor. (3 cr) *Last offered: Fall 2000, Summer 2000, Spring 2000, Fall 1999.*
- CSC 1010 Tools for Text** A unified view of the powerful tools for manipulating text and the algorithms they implement; complexity and security of operations on text; locating and searching online text databases and bibliographies via the Internet; alternative text structures: hypertext, multimedia; alternative input techniques: scanning, voice. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*
- CSC 1020 Fund Computing Systems** Information representation and manipulation; file systems and directories; compatibility and data exchange; security and privacy; elements of computer architectures and operating systems; computer networks, the Internet, and the World Wide Web; PC based examples and illustrations. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- CSC 1024 Computing for Scientists** Active learning of computing skills necessary for science students: data graphing, regression analysis, animation, symbolic computing, information search techniques, scientific report writing, Web page construction, fundamentals of programming. (1 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*
- CSC 1030 Prob Solv with Computers** Using the microcomputer as a problem solving tool; system use; general purpose language programming; spreadsheet analysis and modeling; retrieving information from the Internet; strengths and weaknesses of computer based problem solutions. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- CSC 1040 Computing with Images** Computing systems as tools for design and publishing of graphically-rich material in many forms: Image processing techniques and systems; image style and related tools; digital image processing theory; computational complexity; multimedia. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- CSC 1051 Algorithms & Data Struc I** Problem analysis; algorithm design and refinement; extensive programming using an object-oriented language such as Java or C++; loops, selection, objects, classes, arrays, strings, inheritance; basic sorting and searching. (4 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- CSC 1052 Algorithms & Data Struc II** Abstract data types; dynamically linked structures; recursion; lists, stacks, queues, trees, graphs; advanced sorting and searching; requires extensive programming. (4 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: CSC 1051.
- CSC 1200 Computer Organization** Computer structure; central processing unit; binary number representation and arithmetic; digital logic design; storage units; machine language; introduction to assembly language. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).
- CSC 1300 Discrete Structures** Mathematical structures that support computer science: sets, logic and proof, mathematical induction, relations, functions, counting techniques, probability, boolean algebra, matrices, graphs and trees. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Summer 2000.* Prerequisites: (CSC 1051 and CSC 1052 (may be taken concurrently)) or CSC 2070.

CSC 1600 Operating Systems System software design and implementation; process and resource management; concurrency, scheduling, and deadlock; memory management; file systems and security. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: CSC 1200 or ECE 2490 or ECE 2040.

CSC 1700 Analysis of Algorithms Efficiency classifications and mathematical analysis of recursive and nonrecursive algorithms: sorting, searching, string processing, graphs, arithmetic; parallelism. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).

CSC 1800 Organ of Prog Languages High level language features: data types, control structures; formal lexical and syntactical analysis; operational semantics; language translation. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 2000, Fall 1999.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).

CSC 2053 Alg & Data Structures III A continuation of the topics of 1051-1052, with an emphasis on graphic user interface design and modern programming techniques. (4 cr) Prerequisites: CSC 1051 and CSC 1052.

CSC 2070 Alg & Data Struct: Accel Introduction to object-oriented software development and data structures for students with some programming experience; objects, classes, inheritance, polymorphism; linked data structures; stacks, queues, lists, trees; recursion; basic sorting and search; requires extensive programming. (4 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

CSC 2500 Survey of Information Science Brief introductions to several areas in which problems in information use are important. Examples are business, law, biology, medicine, electronic commerce, and libraries. (3 cr)

CSC 2993 Internship in Computing Internship in computer science open to second semester sophomores and above. Most likely, intern will participate in computer system development, maintenance, or evaluation in an environment which supports sound software engineering techniques. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

CSC 2996 Internship in Computing Internship in computer science open to second semester sophomores and above. Most likely, intern will participate in computer system development, maintenance, or evaluation in an environment which supports sound software engineering techniques. (6 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

CSC 3400 Information Retrieval Theory and practice of location, organization, and rendering of meaningful content from largely unorganized sources. (3 cr) Prerequisites: CSC 2500.

CSC 4140 Theory of Information Information and coding theory, data compression, cryptology. (3 cr) Prerequisites: CSC 1300 and CSC 2500.

CSC 4170 Theory of Computation Finite automata and regular expressions; push down automata and context-free grammars; Turing machines; Church's thesis; computability; NP-completeness. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 2000, Fall 1999.* Prerequisites: CSC 1700.

CSC 4181 Compiler Construction (3 cr)

CSC 4200 Adv Algs and Complexity Greedy algorithms, divide-and-conquer; dynamic programming; backtracking; branch-and-bound; linear and integer linear programming; Fast Fourier transform, probabilistic algorithms; NP-complete problems and approximation methods. (3 cr) *Last offered: Fall 1996, Spring 1995.* Prerequisites: CSC 1700.

CSC 4280 Parallel Algs & Architecture Design and analysis of parallel algorithms for arithmetic, matrix operations, sorting, simulation, combinatorial and graph problems, and Fast Fourier Transform. Taxonomies of parallel architectures; interconnection networks, meshes, trees, and hypercubes; scalability and speed-up. (3 cr) *Last offered: Fall 2000, Spring 1999, Spring 1998, Spring 1997.* Prerequisites: (CSC 1600 and CSC 1700).

CSC 4300 Computer Graphics Hardware and software in computer graphics; graphics programming language; input/output device handling; modeling in 3D space; development of interactive software. (3 cr) *Last offered: Fall 1999, Fall 1997, Fall 1995.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).

CSC 4380 Info Visualization The presentation of information; project based course - possible topics: visual cognition, scientific visualization, illustration presentation, color theory, motion dynamics, image processing. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1998, Spring 1996.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).

CSC 4400 Microprocessors Introduction to 8-, 16-, and 32-bit microprocessors; programming model; system architecture and software; instruction sets; addressing modes; input-output protocols; interrupt handling; RISC architecture. (3 cr) Prerequisites: CSC 1200 or ECE 2490 or ECE 2040.

CSC 4480 Principles of Database Systems (3 cr) Prerequisites: CSC 2053.

CSC 4490 Data Warehousing & Mining Tools and techniques, theory and practice for storage and effective use of massive data sets. (3 cr) Prerequisites: CSC 4480.

CSC 4500 Artificial Intelligence The nature of intelligence and the question of its computer implementation; search algorithms; knowledge representation; automated deduction; natural language understanding; planning; problem solving. (3 cr) *Last offered: Spring 2001, Fall 1999, Fall 1997.* Prerequisites: CSC 1700.

CSC 4550 Expert & Knowledge Systems Knowledge representation, uncertainty, automated knowledge acquisition, practical aspects of implementing expert systems. (3 cr)

CSC 4600 Distributed Processing Data concurrency; distributed file systems and database; distributed operating systems; security; interprocess communication; directory services; process migration; process vulnerability to partial failure. (3 cr) *Last offered: Fall 2000, Fall 1999, Spring 1997, Spring 1995.* Prerequisites: CSC 1600.

CSC 4630 Software Dev. and Systems Operating system structures; system calls; system libraries; interprocess communication; user-interface programming environments; software utilities; software portability. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CSC 1600.

CSC 4700 Software Engineering Management and production of software systems; the software life cycle; software design techniques and methodologies; participation in a team software development project. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Fall 1999.* Prerequisites: or CSC 2070) and CSC 1300(CSC 1052).

CSC 4730 Human Computer Interaction Design of the user/system interface; measurement of human-computer interaction; models of the user and user communities; design criteria for the interface; user interface management systems (UIMS); test and evaluation strategies and tools. (3 cr) *Last offered: Fall 2000, Fall 1998, Fall 1996.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).

CSC 4780 Database Systems Concepts and technology of database management systems; data modeling with an emphasis on the relational model; database querying and normalization; physical data organization. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: (CSC 1052 or CSC 2070) and (CSC 1300 or MAT 2600).

CSC 4790 Senior Projects Capstone course centered around a semester long software development or research project; project planning; requirements elicitation and specification; teamwork; oral presentations required of all students. (3 cr) *Last offered: Fall 2001.* Prerequisites: CSC 4700.

CSC 4800 Web Application Development Theory and design of web-based applications: stylesheets, applets, HTML, CGI programming, web server design, website design, security, multimedia representations, encryption, compression. (3 cr)

CSC 4900 Computer Networks Application development over the TCP/IP and OSI network environments; client server computing; use of the WWW as a distributed platform; hypermedia; directories; network protocols; authentication and authorization. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CSC 1600.

CSC 5900 Seminar in Computing Study and discussion of selected topics in computer science with presentations by individual students. May be repeated for credit if topics are different. Prerequisites may be imposed depending on the topics. (3 cr) *Last offered: Spring 1996, Fall 1995.*

CSC 5930 Topics Computer Science Lecture presentation of selected topics in computer science. May be repeated for credit if topics are different. Prerequisites may be imposed depending on the topics. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

CSC 5940 Topics in Information Science Lecture presentation of selected topics in information science. May be repeated for credit if topics are different. Junior standing. (3 cr)

CSC 5993 Independent Study Reading, research and/or projects in a selected area of computer science under the direction of a member of the staff. May be repeated for credit. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

DIT 1141 Operations Management Concepts and techniques for problems in manufacturing and service organizations. Topics: decision-making, forecasting, resource allocation, project management, quality, materials management, technology, and strategy. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: DIT 2010 or STA 2108.

DIT 2006 Info Systems for Mgt Structure and applications of computer-based Management Information Systems in organizations. Topics: impact of information technology on organizations, ethical issues, technical foundations of hardware/software, management of data, and telecommunications. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

DIT 2010 Business Statistics Statistical concepts and methods used in business and economics, including Probability, Discrete Probability, Sampling Distributions, Confidence Intervals, Hypothesis Testing, Regression Analysis, and Chi-Square Distribution, (ANOVA). (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

DIT 2150 Operations Plan Control Concepts and techniques for problems in production, planning and scheduling, inventory control and maintenance management. (3 cr) Prerequisites: DIT 1141.

DIT 2160 Intro Decisions Sciences Integrate behavioral science and quantitative approaches to decision-making; descriptive and prescriptive models in individual, group, and organizational settings, expected value, utility theory, the analytic hierarchy process, and risk analysis. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: DIT 1141 or MGT 1141.

DIT 2165 Systems Analysis Design This course includes tools and techniques used to document information systems. Classical and structured methodologies for describing data flow, data structure, process flow, file design input and output designs, and program specifications are applied to documenting systems. Data gathering and reporting, project management, and cost/benefit analysis are surveyed. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.* Prerequisites: MGT 2006 or DIT 2006.

DIT 2170 Database Management Theoretic and practical issues related to the management of a database in a business environment including: the role of databases and database applications in contemporary organizations; data modeling using the entity-relationship and semantic object models; fundamentals of the relational data model and its implementation along with SQL; and characteristics of distributed databases and Client/Server database technologies. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000.* Prerequisites: CSC 1051.

DIT 2171 Database Fundtl & CRM Integ Practical issues related to the management of a relational database in a business environment and its role in implementing a Customer Relationship Management (CRM) application. Database architecture, design, SQL, and application management. Students will be directed to combine material from the CRM text specifically relating to the role of the data warehouse in the development of CRM applications. This course will be conducted 100% on-line using WebCT. (2 cr) *Last offered: Spring 2001.*

DIT 2172 Data Communication & Networks Concepts and terminology of data communication and networking, encompassing both technical and managerial aspects. Fundamentals of telecommunications, data transmission mechanisms, telecommunication media and technologies, considerations for LAN and WAN implementations, the Internet and intranet applications, in the context of Customer Relationship Management (CRM) system applications. 100% online. (2 cr) *Last offered: Summer 2001.*

DIT 2173 CRM Systems Consulting Common consulting practices and their application to Customer Relationship Management (CRM) systems. Current technologies in the CRM marketplace, methods used in consultative selling, and building CRM consulting practices and programs. Case studies and presentations. 100% online. (2 cr)

DIT 2174 XML and E-Commerce Concepts and strategic impact of eXtensible Markup language (XML). Markup languages in general, with attention to XBRL and ebXML. Hands-on experience in developing XML applications. 100% online. (2 cr)

DIT 2175 App Decision Anal&Support Sys Computer-based decision analysis and support models in a business environment. Potential topics include: decision analysis and support; group decision support systems; and intelligent support systems. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.* Prerequisites: CSC 1051.

DIT 2176 Entr Computing & E-Commerce Concepts and impact of Enterprise Computing. "Open systems" architecture, integration of data and applications, and "process review" in Enterprise Resource Planning systems (ERP). Integration of ERP systems with CRM and XML applications. 100% online. (2 cr)

DIT 2180 Data Communications Data communication technologies to support the effective and efficient management of information in an organization. Topics will include: the different competing data communication architectures and protocols; an overview of different network topologies and technologies such as LAN, WAN, intranets, and Value-added networks. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000.* Prerequisites: or MGT 2006DIT 2006.

DIT 2185 Advanced topics in MIS State-of-the-art topics in information technology. Possible topics include: expert systems and applied artificial intelligence, advanced networks, etc. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Spring 2000.* Prerequisites: or MGT 2006DIT 2006.

DIT 3310 Business Admin Internship Employment with approved business firms where various meaningful assignments are performed with appropriate training, instruction, and supervision. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

DIT 3330 Ind Study-Operations Mgt Study with faculty member's guidance in area of special interest to student. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

DIT 3331 Ind Study - Mgt Info Sys Study with faculty member's guidance in area of special interest to student. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000.*

ECE 2040 Fund Computer Engineering I Computer arithmetic; Boolean algebra; logic circuit design; assembly language programming; computer architecture. Practicum includes logic circuit design exercises and assembly language programming of the 68000 microprocessor. Required first course for CPE and EE majors. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ECE 2041 Fund Computer Engineering II Additional assembly language programming; microprocessor hardware and interfacing; interrupts; memory; input/output. Practicum includes assembly language programming of the 68000 microprocessor and interfacing exercises. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.* Prerequisites: ECE 2040.

ECE 2050 Fund Electrical Engineering I Basic electrical concepts; dc circuit analysis; diodes and applications; signals and amplifiers; BJT transistor and switching circuits; energy storage devices. Required first course for CPE and EE majors. Three lecture

hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: MAT 1505.

ECE 2051 Fund Electrical Engineering II Transient circuit analysis; ac circuit analysis; ac power; frequency response; resonance; complex frequency. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ECE 2050.

ECE 2409 Fundamentals of MATLAB Use of MATLAB, a matrix oriented, high level programming language, for the simulation and modeling of physical systems. Matrix operations, extensive 2-dimensional and 3-dimensional graphing, introduction to MATLAB toolboxes. Lectures are conducted in parallel with hands-on programming and computer simulations. One lecture hour and one laboratory period per week. (2 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ECE 2420 Eng Programming & Applications Topics in C programming: File input/output, error recovery, bit operators, pointers, dynamic memory allocation, structures, functions and function operators. Applications: engineering numerical computations, Boolean algebra, circuits, signal processing. Introduction to Java. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Spring 1999.* Prerequisites: EGR 1611.

ECE 3220 Signal Processing Signal representation, Fourier series, Fourier transform, discrete-time systems, convolution, discrete-time Fourier transform, Z-transform. Practicum includes MATLAB exercises on transform properties and their use in modulation and filtering. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001, Fall 2000.* Prerequisites: ECE 2051 and ECE 2409 and MAT 2705.

ECE 3240 Discrete-Time Signals & System Discrete-time signal and system representation; sampling of continuous signals; discrete-time Fourier and z transforms; frequency content of signals and frequency response of systems; system analysis and filtering. Practicum includes use of MATLAB on filtering, channel equalization, music synthesis and spectrum analysis. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Spring 2001.* Prerequisites: ECE 2051 and ECE 2409 and MAT 2705.

ECE 3420 Expert Systems Programming Functional, rule-based, and object-oriented features of CLIPS. Forward chaining using CLIPS. Backward chaining using Prolog. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 2000, Spring 1999.*

ECE 3445 Computer Architecture Basic principles of high performance computer architecture. Instruction set, data path, and control implementation, pipelining, memory hierarchy (cache, virtual memory), input/output, superscale concepts, and multiprocessing. Practicum with assembly language programming of the MIPS processor and VHDL implementation of a simple MIPS computer. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001.* Prerequisites: ECE 2041.

ECE 3450 Digital Electronics Digital logic families with primary emphasis on external electrical characteristics of the logic devices. Applications and designs at the board-level, involving topics such as series/parallel conversion and analog/digital conversion. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000.* Prerequisites: ECE 2051.

ECE 3500 Electronic Materials & Devices Physics of crystal structures, energy bands, Fermi level, charge carriers, the pn junction, and excess carriers. Devices: diodes, bipolar junction transistors and field effect transistors. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001, Fall 2000.* Prerequisites: ECE 2510 or ECE 2051.

ECE 3550 Analog Electronics Analysis, design, and simulation of analog electronic circuits. Single and multistage amplifiers, amplifier frequency response, power amplifiers, linear and nonlinear op-amp circuits, active filters, oscillators. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Spring 2001.* Prerequisites: ECE 2051.

ECE 3690 Engineering Electromagnetics Maxwell's equations, plane waves, dissipative media, reflection and transmission of waves at an interface, metallic and optical waveguides, transmission lines, linear and array antennas. Practicum includes computer projects, laboratory demonstrations and problem solving. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Spring 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: MAT 2500 and PHY 2402.

ECE 3720 Eng Probability & Statistics Discrete and continuous random variables, moments and conditional statistics, random processes, Markov chains, queuing theory. Computer simulation projects include random numbers and random variables, modeling of probabilistic experiments, and statistical analysis of random data. Prerequisites: Junior CPE or junior EE standing. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ECE 3770 Electrical Communications Analog and digital communications systems: characterization of communication channels, bandwidth and signal distortion; AM and FM, FM stereo and Dolby noise reduction; sample and hold, source encoding, matched filtering, digital modulations and error control coding. Practicum includes analysis and simulation of products such as compact discs and high speed modems. (4 cr) *Last offered: Spring 2001.* Prerequisites: (ECE 3220 or ECE 3240) and ECE 3720.

ECE 3950 EE Design Seminar Areas and career paths in electrical engineering. Overview of required senior project courses and faculty project sponsors. Engineering design, project selection requirements, technical communications, information gathering. Requires selection of design project adviser, project topic, and a formal written project proposal. Prerequisite: Junior standing. (2 cr) *Last offered: Spring 2001, Summer 2000, Spring 2000, Summer 1999.*

ECE 3951 CPE Design Seminar Areas and career paths in computer engineering. Overview of required senior project courses and faculty project sponsors. Engineering design, project selection requirements, technical communications, information gathering.

Requires selection of design project adviser, project topic, and a formal written project proposal. Prerequisite: Junior Standing. (2 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

ECE 4290 Engr System Models & Control Modeling and analysis of electrical, mechanical, and electromechanical systems; open-loop and feedback systems; frequency domain models; state equations; linearization; time response; steady-state error; block diagrams and signal flow graphs; stability criteria; root locus method. Practicum includes laboratory experiments involving actual engineering systems. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Fall 1999.* Prerequisites: (ECE 2290 or ECE 2051) and PHY 2402.

ECE 4420 Reliability w Eng Applications Introduction to the theory and practice of reliability evaluation. Reliability function, hazard rates, MTTF, component reliability, reliability network modeling, various approaches to reliability evaluation, reliability of systems with repair, MTBF, approximations to systems reliability, introduction to software reliability. (3 cr) *Last offered: Fall 1997, Fall 1996, Fall 1995.* Prerequisites: ECE 3720.

ECE 4470 Computer Networks Computer network technologies including asynchronous transfer mode (ATM), Internet, and telephony; protocol layering; multiple access; switching; scheduling; naming, addressing, and routing; error and flow control; traffic management; analysis of common protocols used in Internet, and ATM networks; protocol implementation techniques used in real networks. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Fall 2001.*

ECE 4950 EE Project I Electrical engineering design process including specifications, tradeoffs, revisions, economic constraints, organization, scheduling, test plans. Project reconfirmation from ECE 3950. Requirements: progress reports, written interim project report, oral presentation. Each design group meets once a week with adviser. (2 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ECE 3950.

ECE 4951 CPE Project I Computer engineering design process including specifications, tradeoffs, revisions, economic constraints, organization, scheduling, test plans. Project reconfirmation from ECE 3951. Requirements: progress reports, written interim project report, oral presentation. Each design group meets once a week with adviser. (2 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: ECE 3951.

ECE 4990 Elect Engr Project II Completion of the design project presented in ECE 4950. Requirements: written and oral progress reports, demonstration of achieved objectives, formal written final report, oral presentation. Each design group meets once a week with their adviser. Class meets once a week with coordinator. (4 cr) *Last offered: Summer 2001, Spring 2001, Fall 2000, Summer 2000.* Prerequisites: ECE 4950.

ECE 4991 CPE Project II Completion of the design project presented in ECE 4951. Requirements: written and oral progress reports, demonstration of achieved objectives, formal written final report, oral presentation. Each design group meets once a week with their adviser. Class meets once a week with coordinator. (4 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: ECE 4951.

ECE 5091 Special Topics in E E Topics of current interest and importance in electrical engineering, including an examination of pertinent literature. (3 cr) *Last offered: Spring 2000, Spring 1999.*

ECE 5092 Special Topics in E E Topics of current interest and importance in electrical engineering, including an examination of pertinent literature. (3 cr)

ECE 5240 Multimedia Algorithms and standards that make possible multimedia communication and storage over the internet, including baseline JPEG, JPEG 2000, video compression (MPEG-1, 2, 4), audio compression and MP3, DVD, video conferencing and streaming, multimedia over broadband (DSL and cable), multimedia database search and retrieval and digital watermarking for multimedia content ownership and intellectual property rights protection. Prerequisites: Senior CPE or senior EE standing. (3 cr) *Last offered: Fall 2001.*

ECE 5390 Control System Design Problem formulation, design techniques and evaluations, time domain and frequency domain design methods. Incorporates computer-aided analysis and design in conjunction with required laboratory projects. Three lecture hours and a two-hour practicum per week. (4 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1997.* Prerequisites: ECE 4290.

ECE 5430 Microcomputer System Design Design and construction of a functional microcomputer using a lab trainer, a set of integrated circuit chips, a microprocessor, RAM, ROM, and interface components. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: ECE 3490 or ECE 2041.

ECE 5444 Introduction to Fuzzy Logic Applications and methodologies of fuzzy logic using MATLAB. (3 cr) *Last offered: Fall 2001, Fall 2000.*

ECE 5445 Intro to Neural Networks Applications and methodologies of neural networks using MATLAB. (3 cr)

ECE 5450 Microcontrollers & Applic Architecture of an 8-bit microcontroller, I/O ports, serial interface, external memory and I/O, A/D converters, UARTS, pulse width modulators. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: ECE 3490 or ECE 2041.

ECE 5460 Intro to VLSI Design Design disciplines for Very Large Scale Integration, switching models of MOS systems, basic device equations, combinational and sequential systems design, simulation, timing verification. UNIX CAD VLSI tools will be used for projects. (3 cr) Prerequisites: ECE 3445.

ECE 5475 CPE Data Comm & Ntwks Communication links, transmission over voice grade circuits, channel capacity and packet switching, multiplexing, synchronization, error correction, satellite communications, optical fiber transmission. (3 cr) Prerequisites: ECE 3490 or ECE 2041.

ECE 5477 Computer Comm Security Theory and practice of computer communications security, including cryptography, authentication, and secure electronic mail. Topics include secret and public key cryptography; message digests; password-based, address-based, and cryptographic authentication; privacy and authentication in email; PEM, PGP, and S/MIME. Use of various algorithms. Prerequisites: Senior CPE or senior EE standing. (3 cr) Last offered: Spring 2001.

ECE 5484 Adv Digital System Design In-depth treatment of combinational logic design, state machine design, and systems-level design. CAD tools, hardware description languages (VHDL) for design and simulation, field programmable gate arrays (FPGA). (3 cr) Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998. Prerequisites: or ECE 2040 ECE 2490.

ECE 5540 Digital Integrated Electronics Implementation and design of high speed bipolar and MOS digital integrated circuits. TTL, ECL, CMOS, and BiCMOS logic families. Emphasis on practical design issues involving signal integrity and interfacing between logic families. (3 cr) Last offered: Spring 1999, Spring 1998, Spring 1996. Prerequisites: ECE 3450.

ECE 5545 Microelectronic Fabrication Basic fabrication processes of silicon microelectronic circuits. Interrelationships between the material processing and the operational characteristics of a device. Integration of the various material processes in forming bipolar and MOS integrated circuit technologies. (3 cr) Prerequisites: ECE 3500.

ECE 5560 Analog Systems I Modeling of active and passive components, characterization of IC subcircuits and their applications, theory and application of op-amps in analog circuit design. Use of manufacturer's data sheets, use of CAE tools for analog circuit design and simulation, practical aspects of design are emphasized. (3 cr) Last offered: Spring 2001, Spring 1999, Spring 1998, Spring 1997. Prerequisites: ECE 3510 or ECE 2051.

ECE 5565 Analog Systems II Advanced topics in analog circuit design. Linear and switching power supplies, regulators, filter specifications, design and sensitivity analysis, oscillators, A/D and D/A converters, VFC, FVC, opto-coupler/isolators, waveshaping circuits. Application of CAE tools for design, simulation and verification. Practical aspects of design and trouble shooting techniques are emphasized. (3 cr) Last offered: Spring 1996, Spring 1995. Prerequisites: ECE 3510 or ECE 2051.

ECE 5680 Photovoltaic Power Generation Nature and availability of solar energy; solar cell design, including materials selection; photovoltaic modules and arrays; inverters; stand-alone systems; grid interconnection; economic considerations. (3 cr) Last offered: Fall 1995. Prerequisites: ECE 3500.

ECE 5690 Microwave Networks Plane wave propagation; propagation in TEM transmission lines and waveguides; IMPATT; TRAPAT; Gunn-Effect and parametric devices; microstrip lines and microwave integrated circuits; laboratory work includes measurement of SWR, impedance, and power at microwave frequencies. Three lecture hours and a two-hour practicum per week. (4 cr) Last offered: Fall 2001, Fall 2000, Spring 1999, Spring 1998. Prerequisites: ECE 3690.

ECE 5750 Communication Electronics Analysis of circuits used in radio frequency communication transmitters and receivers. Elements of radio systems, electrical noise, modulation, detection, oscillators, mixers, power amplifiers and design. (3 cr) Last offered: Fall 2001, Fall 2000, Spring 1999, Spring 1998. Prerequisites: ECE 3510 or ECE 3550 or ECE 5560.

ECE 5760 Intro to Optoelectronics Introduction to various optoelectronic devices, including light emitting devices, photodetectors, optical modulators, solar cells and display devices. Applications to systems. (3 cr) Last offered: Fall 1999, Fall 1998, Fall 1997, Fall 1996. Prerequisites: ECE 3500.

ECE 5790 Digital Signal Processing Review of discrete-time signals and systems; design and implementation of digital filters; Fast Fourier transform algorithms and applications; introduction to statistical signal processing; computer-aided design projects. Three lecture hours and a two-hour practicum per week. (4 cr) Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998. Prerequisites: ECE 3220 or ECE 3240.

ECE 5792 Real-Time Dig Sig Processing Real-time computation of digital signal processing including reverberation effects, band selective filtering, multirate processing, adaptive filtering, and spectrum estimation; implementation on a real-time DSP signal processing chip; chip architecture, assembly language; aliasing, data quantization, computational limitations, signal level limiting, scaling and I/O handling. (3 cr) Last offered: Spring 2001. Prerequisites: ECE 5790.

ECE 5810 Power Systems Three-phase circuits and power, transmission line parameters and models, transformer models, the per-unit system, power flow analysis, synchronous generator models. (3 cr) Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998. Prerequisites: ECE 2051.

ECE 5820 Operation of Elec Power System Economic operation, system stability, unbalanced fault analysis, protective relaying, voltage control, power line communication, power control. (3 cr) Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997. Prerequisites: ECE 5810.

ECE 5991 Elec Eng Research I Students work with faculty on current research topics. Weekly meetings with faculty adviser and a final written report and/or oral presentation are required. (3 cr) *Last offered: Fall 2001, Summer 2001, Summer 2000, Fall 1999.*

ECE 5992 Elec Eng Research II Continuation of ECE 5991. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

ECE 6020 Intro to Electrical Systems A survey course for non-electrical engineering students. Electrical components, dc circuits, ac circuits, power systems, electric machines, analog and digital electronics. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: PHY 2402.

ECO 1001 Intro to Micro The price system; demand and supply analysis; the production process; analysis of market structures. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ECO 1002 Intro to Macro The economic system and its fundamental principles. The economic functions of government, monetary and fiscal policy, and international trade. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ECO 1103 Econ of Social Issues Major economic and social problems facing the American economy: evaluation of the various policy alternatives for solving these problems. Topics include population, discrimination, environment, poverty and international trade. Students may receive credit for either this course or ECO 1002, not both. ECO 1104 Environmental problems and strategies to deal with them: environmental damage and economic growth; pollution and technology; pollution; air, water, and solid waste disposal. (3 cr)

ECO 1104 Environment & Economy Environmental problems and strategies to deal with them: environmental damage and economic growth; pollution and technology; pollution; air, water, and solid waste disposal. (3 cr) *Last offered: Fall 2001, Fall 1996.*

ECO 1903 Internship Elective (3 cr) *Last offered: Summer 2001, Summer 2000, Fall 1999, Summer 1999.*

ECO 1906 Internship Elective (6 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.*

ECO 1909 Internship Elective (9 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.*

ECO 2101 Macro-Econ Theory The components of aggregate economic growth. Theories underlying public policies which attempt to achieve the objectives of price stability, full employment and economic growth in the United States. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: (ECO 1101 or ECO 1001 or HON 1080) and (ECO 1102 or ECO 1002 or HON 1081).

ECO 2102 Micro-Econ Theory Economic and mathematical analysis of the equilibrium conditions of the household, the firm, and industry, in various market structures, together with a brief examination of the general equilibrium of the economy; emphasis upon developing a working knowledge of elementary mathematical analysis as it applies to present economic theory. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: (ECO 1001 or HON 1080) and (ECO 1002 or HON 1081).

ECO 2137 Statistics for Economics Descriptive statistics, probability, statistical inference, simple and multiple regression; use of statistical methodology to conduct economic analysis. (3 cr) Prerequisites: ECO 1001 and ECO 1002.

ECO 2993 Internship (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

ECO 2996 Internship (6 cr) *Last offered: Summer 2001, Summer 2000, Fall 1999, Summer 1999.*

ECO 3106 Econ of Money & Banking Principles of money, banking and financial markets; the relationship of the monetary and banking system to the functioning of the economy; the theory and practice of monetary policy; the function of money in international payments. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Spring 1999.* Prerequisites: ECO 1001 and ECO 1002.

ECO 3109 International Economics Comparative advantage; gains from foreign trade; Heckscher-Ohlin doctrine; technology and product cycles; tariff theory and policy; Other protection measures; economic integration; foreign exchange rates; fixed and flexible rates; balance of payments; multinational corporations. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: (ECO 1001 or HON 1080) and (ECO 1002 or HON 1081).

ECO 3111 Hist of Economic Thought The evolution of economic analysis within the context of contemporary economic institutions and associated social, ethical, and political thought. This is a writing enriched course. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: ECO 1001 and ECO 1002.

ECO 3112 Public Finance The economic role of government and the theory and practice of public expenditure and taxation. Government's impact on the allocation of resources and the distribution of income in a mixed economy. Topics include economic welfare, public expenditure analysis, tax incidence, public choice analysis, cost-benefit analysis. (3 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Fall 1999.* Prerequisites: ECO 1001.

ECO 3115 Alternative Econ Systems Presentation, comparative analysis and discussion of the structure, performance, efficiency and growth aspects of various economic systems. This is a writing enriched course. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: ECO 1002.

ECO 3118 Women and the Economy The role of women in the economy and its implications. Economics of the household, marriage, fertility, divorce unemployment, earnings of women and occupational choice. International comparisons and current public

policy issues. (3 cr) Sem 2. Prereq: ECO 1002. (3 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997.*
Prerequisites: ECO 1001.

ECO 3123 Labor Economics Economic theories concerning the employer's labor demand, the individual's labor supply, educational/occupational choices, labor unions, on-the-job training, discrimination, labor market mechanisms and wage determination. Public policies which affect the market. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1997.* Prerequisites: ECO 1001.

ECO 3125 Industr Org & Public Pol Economics of American industrial organization; market structure, conduct, and performance; the workability of competition in selected industries; the application of public policy and anti-trust law. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: ECO 1001.

ECO 3126 Amer Econ Development Growth of the American economy in terms of its various sectors and their interrelations; the evolution of important economic institutions and ideas and of the role of the entrepreneurs. This is a writing enriched course. (3 cr) Prerequisites: ECO 1001.

ECO 3127 Econ Underdeveloped Area Structural change in the process of development; growth patterns and income distribution; determinants and role of saving, investment, technological change; strategy and methods of development planning; the role of government; social institutions. This is a writing enriched course. (3 cr) *Last offered: Spring 1997, Spring 1996, Spring 1995.* Prerequisites: ECO 1002.

ECO 3128 Intro Mathematical Econ Variables and functions, matrices and determinants, difference equations, and calculus. Applications to economic and business problems, including market equilibrium, revenue and cost functions, marginal theory, maximization problems, input-output analysis, and selected deterministic models. (3 cr) Prerequisites: ECO 1001 and ECO 1002.

ECO 3135 Case Studies Amer Indust Structure and conduct of selected industries in the U.S. Economy chosen from the manufacturing, finance, energy, public utility, and transportation sectors. Effects of government policies such as regulation, deregulation, antitrust, subsidization, and protection from foreign competition. This is a writing enriched course. (3 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997.* Prerequisites: ECO 1001.

ECO 3137 Intro to Econometrics Intermediate course in stochastic methods with emphasis on applications; estimation, hypotheses testing, regression analysis, economic forecasting, time series analysis and probabilistic formulation of economic relationships such as consumption and production functions. (3 cr) *Last offered: Fall 2001, Fall 1999, Fall 1998, Fall 1997.* Prerequisites: ECO 1001 and ECO 1002 and STA 2108.

ECO 3141 Urban Economics Economic structure of urban areas and problems associated with it; growth of urban areas; urban and suburban economic inter-dependence, finances, tax base and burden, urban poverty, social welfare, housing and transportation problems. This is a writing enriched course. (3 cr) *Last offered: Spring 1997, Spring 1995.* Prerequisites: ECO 1001 and ECO 1002.

ECO 4132 Seminar in Economics Capstone course requiring students to utilize the tools of analysis and expression, including not only economic theory and applications, but also writing, speaking and mathematics. Computer skills expanded. This is a writing intensive course. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: ECO 2101 and ECO 2102 and (STA 2108 or DIT 2010).

ECO 4200 Topics in Economics Selected topics in economics currently of interest to faculty and students. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ECO 1001 and ECO 1002.

ECO 4201 Population & Eco Develop (3 cr)

ECO 4204 Eco Lat Amer & Caribbean (3 cr)

ECO 4205 Time Series Analysis (3 cr) *Last offered: Spring 1998, Spring 1996, Spring 1995.*

ECO 4206 Eco of Religious Orgs (3 cr)

ECO 4207 Poverty and American Eco An economic perspective on poverty in United States. Measurement of poverty and how it has changed. Underlying causes of poverty during past decade. Policies used to combat poverty. (3 cr) *Last offered: Fall 2000, Fall 1998, Fall 1997, Spring 1997.*

ECO 4208 Public Choice The application of economic methodology to the subject of political science. (3 cr) *Last offered: Spring 1997, Fall 1996.*

ECO 4300 Topics in Economics Selected topics in economics currently of interest to faculty and students. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Fall 1999.* Prerequisites: (ECO 1001 or HON 1080) and (ECO 1002 or HON 1081).

ECO 4500 Independent Study in Eco Students with specific interests work on a tutorial basis with faculty. A departmental independent Research Proposal form must be approved by the directing faculty member and the department chairman prior to registration. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

EDU 2201 Social Foundation Educ I Major movements in the history of education to 1600 with emphasis on their social and philosophical context; historical development of educational aims, curriculum and types of education; religious and political influences on education. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Summer 2000.*

EDU 2202 Social Foundation Edu II Development of public and private education in America in its social and philosophical context; types of education, governmental activity in education, educational finance, religious and political influences, impact of European developments. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

EDU 3251 Psychology of Learning The application of learning theory to classroom teaching. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

EDU 3254 Prin & Tech of Instruct The school curriculum; principles for selecting and using instructional materials; principles of educational measurement and evaluation; practical exercises in the use of media and materials, and in educational measurement; (4 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

EDU 3255 Lab Communication Skills (3 cr)

EDU 3263 Teaching the Exceptional Child Introduction to the physical and social characteristics of disabled and handicapped persons between ages 3 and 21. Issues of inclusion and main streaming in light of recent legislation and court decisions. Problem cases, with an emphasis on the underprivileged, antisocial, and delinquent. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

EDU 4220 Spec Meth Secondary Sch Approaches to teaching and their degrees of effectiveness; classroom management; methods applicable to the teaching of all subjects; student preparation and presentation of material for his/her own subject-matter field. (3 cr) *Last offered: Fall 2000, Spring 1999, Fall 1998, Spring 1998.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254.

EDU 4224 Language Art Elem School (2 cr)

EDU 4243 Read in the Sec School (3 cr)

EDU 4245 Read & Cur Issue Sec Edu Techniques for evaluation of reading skills; methods of teaching reading in the subject areas; strategies for basic skill development; current issues in secondary education, and student observation in the schools. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

EDU 4281 Meth English Sec School The curriculum, planning units and lessons in the teaching area; general methods of teaching, special methods and instructional materials in the subject, including textbooks, courses of study and reference works; application of the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers, and teach pupils in the subject. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254.

EDU 4282 Meth Fgn Lang Sec School The curriculum, planning units and lessons in the teaching area; general methods of teaching, special methods, and instructional materials in the subject, including textbooks, courses of study and reference works; application of the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests and in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254.

EDU 4283 Meth Math Sec School The curriculum, planning units, and lessons in the teaching area; general methods of teaching special methods, and instructional materials in the subject; including textbooks, courses of study and reference works; application of the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests and in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254.

EDU 4284 Meth Science Sec School The curriculum, planning units, and lessons in the teaching area; general methods of teaching special methods and instructional materials in the subject; including textbooks, courses of study and reference works; application to the principles and techniques studied in Education 3254 to teaching the subject; lesson plans, units and tests and in using methods, techniques, and materials in the subject, planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254.

EDU 4285 Meth Soc Stud Sec School The curriculum, planning units, and lessons in the teaching area; general/ methods of teaching, special methods, and instructional materials, in the subject, including textbooks, courses of study and reference works, application of the principles and techniques studied in Education 3254 to teaching the subject, practice in preparing lesson plans, units and tests and in using methods, techniques, and materials in the subject; planned experiences and weekly assignments in neighboring secondary schools to observe, assist teachers and teach pupils in the subject. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254.

EDU 4286 Sem & Apr Sec Sch Teach (3 cr)

EDU 4290 Philosophy of Education The development of a sound personal philosophy of education and practice in applying that philosophy to current educational issues. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

EDU 4291 Student Teaching Observation and teaching under actual classroom conditions in the student's field of teaching specialization; open only to students of the Senior year who have completed all the subject matter courses in the field of specialization. (12 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254. Corequisites: EDU 4292.

EDU 4292 Sen Sem & Student Teach The student teaching experience; elements of school law; current educational issues; use of computers in the classroom; relationship of practice to theory; sharing of experiences, common problems and alternative teaching practices; open to student teachers. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: EDU 2201 and EDU 2202 and EDU 3251 and EDU 3254. Corequisites: EDU 4291.

EDU 4298 Student Teaching (6 cr) *Last offered: Spring 2001, Spring 2000, Spring 1998, Spring 1997.*

EDU 4301 Humanistic Education Principles of humanistic psychology as they apply to education: Active listening, kinesics, values clarification, motivation, classroom groups, and the teacher as a group facilitator. (3 cr)

EDU 5000 Technology in Sec. Schools Integrating technology in secondary classrooms. Use and discussion of basis software packages developed to help motivate students and enhance the learning process in the classroom. (3 cr) *Last offered: Spring 1999.*

EDU 5003 On-Line Communications Basic introduction to networks, the Internet and E-mail and their application to classroom teaching. Includes discussion of and experience with terminology and academic subject specific information locations. (3 cr) *Last offered: Summer 1999.*

EDU 5005 Technology Elementary Classrms Integrating technology in elementary classrooms. Use and discussion of basic software packages developed to help motivate students and enhance the learning process in the classroom. (3 cr) *Last offered: Spring 1999.*

EGR 1610 Engineer Design & Graphics Introduction to engineering and design; the design process; fundamental principles of orthogonal projection; practical problems in descriptive geometry; orthographic and isometric drawing and sketching; conceptual design project; computer graphics. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

EGR 1611 Engineering Analysis Introduction to computer programming using ANSI C, numerical methods; basic concepts of computer operations; use of the computer to solve engineering type problems. (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

EGR 2001 Egr: Humanistic Context A study of selected engineering achievements with emphasis on their technological innovations and impacts on society. Several case studies are examined to explore the connections between specific engineering achievements such as the computer, the DC-10, the Brooklyn Bridge, nuclear power, toxic waste disposal, and specific aspects of society, including political arrangements, art, the media, historical trends, social attitudes, and the role of specific individuals. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 0990 Engl as a Second Lang I Specialized instruction for students in the fundamentals of English. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Spring 1999.*

ENG 0995 Engl as a Second Lang II A continuation of English 0990. (3 cr) *Last offered: Spring 2000, Spring 1996, Spring 1995.*

ENG 1010 Composition The writing of expository prose; readings examined as aids to composition. Restricted to C&F freshman. Writing intensive. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 1050 The Literary Experience An introduction to literature and the methods of literary analysis founded upon close readings of texts from a variety of perspectives and including works from a range of genres and periods. The course is designed to instill within the student a sense of critical confidence through approaches of increasing complexity, from a mastery of the text to an understanding of the broader historical and philosophical forces in the literary work; the course thus addresses the interdisciplinary awarenesses central to the new Core. Individual courses may vary in the works chosen; all courses are writing intensive. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ENG 1903 Internship Elective (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 1906 Internship Elective (6 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 1909 Internship Elective (9 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 2000 Adv Expository Writing Practice in writing reports, reviews, arguments, description; emphasis on organization and development. Permission of instructor required. (3 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Fall 1998.*

ENG 2005 Writing of Short Story Instruction in writing short story. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 1998, Fall 1997.*

ENG 2006 The Writing of Poetry Instruction in writing poetry. Limited to 15 students. Permission of instructor required. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 1999.*

ENG 2007 The Writing of Screenplays Instruction in writing screenplays. Limited to 15 students. Permission of instructor required. (3 cr)

ENG 2008 The Writing of Plays Instruction in writing plays. Limited to 15 students. Permission of instructor required. (3 cr) *Last offered: Fall 2000.*

ENG 2010 Technical Writing The writing of formal reports and proposals and descriptions of mechanisms and processes. (3 cr) *Last offered: Spring 1997, Spring 1996.*

ENG 2015 Business Communication The essential elements of corporate communication, with emphasis on writing. (3 cr) *Last offered: Fall 2000.*

ENG 2020 Interpretive Journalism News gathering and news writing; principles, rules and techniques of effective editorial writings; practical experience in the actual writing of news stories and editorials. Permission of instructor required. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 2030 Tutoring Writers Theory and practice of Writing Center Work; writing, editing and tutoring skills. Permission of instructor required. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

ENG 2040 Literacy and Society The social implications of reading and writing. (3 cr) *Last offered: Spring 1996.*

ENG 2090 Internship: Journalism (3 cr)

ENG 2095 Internship: Publishing (3 cr)

ENG 2101 Brit Literary Trad 1 A study of the growth of British literature from Anglo- Saxon to the Neo-Classical periods. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 2102 Brit Literary Trad 2 Study of British literature from the genesis of Romanticism in the 19th century to the literature of modern times. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ENG 2103 Amer Literary Trad 1 Development of American literature from the Colonial Period to the area of Walt Whitman and other writers whose lives and works largely precede the Civil War. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 2104 Amer Literary Trad 2 The development American literature from the Civil War to modern times. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Summer 2000.*

ENG 2200 Hist of English Language The development of the English language from Old English to Modern English. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

ENG 2250 Intro Literary Criticism Principles of the study of literature; its intellectual and historic principles technical terms and cultural implications. (3 cr) *Last offered: Fall 1999, Spring 1997.*

ENG 2300 Women in Literature Study of the place of women in literature, with emphasis on modern fiction, drama and poetry written in English. Diversity 2 requirement. Writing enriched. (3 cr) *Last offered: Fall 2001, Summer 2000, Spring 2000, Fall 1999.*

ENG 2301 Lit of Science Fiction Science fiction as a significant genre. Writing enriched. (3 cr) *Last offered: Spring 1998, Spring 1997.*

ENG 2305 Intro to Folklore A survey of American folklore as an academic discipline. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 2310 Study of Poetry Concepts of poetry with detailed analyses of selected poems. Writing enriched. (3 cr) *Last offered: Summer 2001, Spring 1996, Fall 1995, Spring 1995.*

ENG 2320 Forms of the Novel The nature of the novel as an art form in British, American, and European works. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Fall 1998.*

ENG 2330 Forms of Drama Introduction to the main types of European and American drama. (3 cr) *Last offered: Fall 1997, Summer 1997, Summer 1996, Spring 1996.*

ENG 2340 Modern Short Story Contributions to the short story form made by American, Irish, British, and Continental writers. (3 cr) *Last offered: Spring 2001, Fall 2000, Fall 1999, Spring 1999.*

ENG 2400 Western World Literature I Readings in translation of some of the classics of Western literature from the ancient world to the Renaissance, by such writers as Homer, Sophocles, Virgil, Dante, and Cervantes. Writing intensive. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 2401 Western World Literature II Readings, chiefly in translation, of some of the classics of Western literature from the Enlightenment to today, by such writers of Moliere, Voltaire, Goethe, Flaubert, Tolstoy, Ibsen, Brecht, Kafka, and Pirandello. Western World Literature is not a prerequisite. (3 cr)

ENG 2450 Irish Literature to 1880 A study of Irish literature from its origins in the world of Celtic mythology, epic and saga through the development of Anglo-Irish literature. Writing enriched. Irish studies requirement. (3 cr) *Last offered: Fall 2001, Summer 2001, Summer 2000, Fall 1999.*

ENG 2460 Irish Poetry since Yeats The major Irish poets of the last fifty years, including an initial assessment of the importance of W. B. Yeats's career, and treatment of poets such as Seamus Heaney, Derek Mahon, Thomas Kinsella, and John Montague. Writing enriched. Irish studies requirement. (3 cr) *Last offered: Fall 1999, Fall 1997, Fall 1995.*

ENG 2470 Modern Irish Drama A study of the major Irish playwrights of the twentieth century including: Yeats, Lady Gregory, Shaw, Synge, O'Casey, Beckett, and Friel. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 1999.*

ENG 2500 Irish Renaissance Selected readings in the drama and fiction literature of Ireland in the 20th century. Writing enriched. Irish studies requirement. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

ENG 2505 Black Literature: Poetry The poetry of Wheatley, Harper, Dunbar, Johnson, Hughes, Brooks, Sanchez, Giovanni, Angelou, Harper, Dove, and other writers of the 18th, 19th, and 20th centuries. Diversity 1 requirement. (3 cr)

ENG 2510 Black Literature: Novel Novels published during Reconstruction, the Harlem Renaissance, the Black Arts Movement, and throughout the 20th century. Writing enriched. Diversity 1 requirement. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Spring 1999.*

ENG 2515 Black Literature: Drama Major works of the Harlem Renaissance, the Black Arts Movement, and the present. Diversity 1 requirement. (3 cr) *Last offered: Spring 2000, Spring 1995.*

ENG 2520 Black Lit: Short Story Short fiction by Chesnutt, Hurston, Petry, Baldwin, McPherson, Williams, Walker, Morrison, Butler, and other writers of the 20th century. Diversity requirement. (3 cr) *Last offered: Spring 2001, Fall 1999, Spring 1999, Spring 1998.*

ENG 2610 Tutorial Readings Program of approved readings under the supervision of a selected faculty member; examination on readings and a lengthy paper required. Restricted to senior English majors with high cumulative averages. Permission of chair required; ordinarily may not be repeated. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ENG 2620 Seminar Individual authors or topics chosen by the instructor. Writing intensive. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ENG 2700 Studies in Literature Specific topics vary each semester. Writing intensive. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 2710 The American Revolutionary Era The most interesting and instructive lives and writings of the American Revolutionary Era Founders. (3 cr) *Last offered: Fall 2001.*

ENG 2720 Amer Criminal Trial Narratives Significant Modern American narratives in the sub-form of Criminal Trials and Courts Martial. (3 cr) *Last offered: Spring 2001.*

ENG 2800 Teaching Practicum Open only to senior English majors with a GPA of at least 3.5. Permission of consulting teacher and chair required. (3 cr) *Last offered: Fall 2001, Spring 2001.*

ENG 2993 Internship Internship (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ENG 2020.

ENG 2996 Internship Prerequisite: 133-2020 (6 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ENG 2020.

ENG 3000 Intro to OE Lang & Lit Old English literary works in translation and original language. (3 cr)

ENG 3100 Anglo-Saxon Lit Culture Material and cultural artifacts of the period ca. 450-1066 within historical, art-historical, archaeological, and literary contexts (works in translation). (3 cr)

ENG 3101 Early Brit Lit Translatn Literature of England, Ireland, and Scotland from the beginnings through the 15th century. (3 cr) *Last offered: Spring 1999, Spring 1998, Spring 1997, Spring 1996.*

ENG 3150 Chaucer The Canterbury Tales, Troilus and Criseyde, and additional works. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 3200 Sem: Medieval Literature Topics vary each semester. Consult departmental bulletin. (3 cr)

ENG 3201 English Renaissance Non-dramatic literature of the English Renaissance. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 2000, Fall 1999.*

ENG 3230 Eliz & Jacobean Drama Playwrights of the English Renaissance excluding Shakespeare. (3 cr) *Last offered: Fall 2000, Fall 1999, Fall 1998, Spring 1997.*

ENG 3250 Shakespeare A selection of plays by Shakespeare. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ENG 3300 17th Cent Poetry & Prose The poetry of Donne, Jonson, Lanyer, Herrick, Herbert; essays, sermons, journals, letters, pamphlets of Bacon, Donne, Milton, and others. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

ENG 3350 Milton English poems and selected prose on issues of gender, politics, religion, culture. Women's studies requirement. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 3420 18th cent British Novel Writings by Defoe, Fielding, Sterne, and others; and the Gothic novel of terror. (3 cr) *Last offered: Spring 2001, Fall 2000, Fall 1999, Spring 1995.*

ENG 3430 Restor & 18th cent Drama Dramatists from Dryden to Sheridan. (3 cr) *Last offered: Fall 1999, Spring 1998.*

ENG 3450 Dryden Swift & Pope The study of the principal works of the major Neo-Classical writers. (3 cr) *Last offered: Fall 2001, Spring 1999, Fall 1997, Fall 1995.*

ENG 3501 Early Romantic Writers Wordsworth, Coleridge and other writers of the first half of the Romantic period. Writing intensive. (3 cr) *Last offered: Spring 2001, Fall 1999, Spring 1999, Fall 1997.*

ENG 3502 Later Romantic Writers Byron, Shelley, Keats and other writers of the second half of the Romantic period. (3 cr) *Last offered: Fall 2001, Fall 1998, Spring 1996, Spring 1995.*

ENG 3504 19th Cent Brit Women Writers Writings by important nineteenth-century British women novelists and poets, including Mary Shelley, Charlotte Bronte, Christina Rossetti, Elizabeth Barrett Browning, and others. (3 cr) *Last offered: Spring 2000.*

ENG 3505 Poetry & Prose 1830-1865 The poetry and prose of Carlyle, Tennyson, Browning, Newman, Arnold, and other writers of the era. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Fall 1997.*

ENG 3506 Poetry & Prose 1865-1900 The poetry and prose of Ruskin, Rossetti, Swinburne, Hopkins, Pater, Hardy, and others. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1998, Spring 1997.*

ENG 3520 19th Cent British Novel Selected novelists from Jane Austen to Thomas Hardy. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 3525 Dickens Selected novels by Charles Dickens. (3 cr) *Last offered: Spring 2001.*

ENG 3610 Modern British Poetry British poetry from 1900 to the present, with emphasis on Hopkins, Hardy, Yeats, Eliot, Auden, Muir, Edith Sitwell, K3 Dylan Thomas, and Philip Larkin. (3 cr) *Last offered: Summer 2000, Spring 2000, Summer 1999, Spring 1998.*

ENG 3615 James Joyce A study of the novels and short stories of James Joyce, with concentration on Ulysses. Writing enriched. Irish studies requirement. (3 cr) *Last offered: Fall 2000, Fall 1999, Fall 1998, Fall 1997.*

ENG 3616 Irish American Drama & Film Depictions of the American Irish in popular drams and films from colonial times to the present. Popular Irish- American actors and their appeal, the Irish-American musical stage tradition, and the cross-over from popular drama to popular films such as John Ford's *The Quiet Man* and *The Informer*. Writing enriched. Irish studies requirement. (3 cr) *Last offered: Fall 2000, Spring 2000, Spring 1999, Fall 1998.*

ENG 3620 Modern British Novel The British novel from the turn of the century to World War II. (3 cr) *Last offered: Fall 2000, Spring 1999, Fall 1997, Summer 1997.*

ENG 3621 Contemp British Novel The development of the novel since World War II. (3 cr) *Last offered: Fall 2000, Spring 1998, Fall 1996, Spring 1995.*

ENG 3630 Modern British Drama British drama from the 1890s to the Theatre of the Absurd. (3 cr) *Last offered: Fall 1999, Summer 1998, Spring 1998, Summer 1995.*

ENG 4001 Major Amer Writers I The masterpieces of selected American writers from early times to the Civil War era. (3 cr) *Last offered: Fall 2001, Spring 2000, Fall 1999, Spring 1999.*

ENG 4002 Major Amer Writers II Masterpieces of the chief American writers since the Civil War. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ENG 4040 American Short Story Development of the short story in America from Washington Irving to the present. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 4500 American Slave Narrative Slavery as a central paradox of American history and literature with emphasis on race and gender. Readings by Doublass, Brent, Stowe, Morrison, and others. Previous course work in American literature is recommended. Diversity requirement. Diversity requirement. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 1999, Spring 1998.*

ENG 4501 Amer Transcendentalism An intensive analysis of Emerson, Thoreau, and other Transcendentalists. (3 cr) *Last offered: Fall 2000, Fall 1996, Spring 1995.*

ENG 4510 19th Cent Amer Poetry American poetry from its beginning to Emily Dickinson. (3 cr) *Last offered: Spring 2000, Spring 1999, Fall 1998, Spring 1998.*

ENG 4520 American Novel to 1895 The genesis of the American novel. (3 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Spring 1999.*

ENG 4530 The American Renaissance Pre-Civil War text, primarily from 1850-1855. (3 cr) *Last offered: Fall 1996.*

ENG 4605 Amer Poetry: 1900-1950 American poets of the first half of the twentieth Century, including Robinson, Frost, Stevens, Cummings, Williams, Millay, Pound, Eliot, and others. (3 cr) *Last offered: Spring 2001, Spring 1999, Fall 1998, Summer 1998.*

ENG 4615 Amer Poetry since 1950 American poets since 1950, including Lowell, Plath, Sexton, Snodgrass, Ginsberg, Rich, Snyder, Baraka, and others. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 1998, Summer 1997.*

ENG 4619 The Works of Edith Wharton Socio-sexual tensions in the world of Edith Wharton. The external world she knew: upper class New York society, its totems and taboos, tribal aspects, and sexual tension; and the internal world of Wharton herself with its repressive sexuality and psychological complexities. Diversity 2 requirement. (3 cr) *Last offered: Fall 1999, Fall 1998.*

ENG 4620 American Novel 1895-1950 Representative novelists from Crane to Steinbeck. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 1999, Spring 1999.*

ENG 4621 Amer Novel since 1950 Novels of the late Modern Period and of the early Post- modern period. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Fall 1999.*

ENG 4630 20th Cen American Drama Major plays of the period. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ENG 4635 Contemporary American Poetry Focused study of contemporary American poetry emphasizing gender, ethnicity, aesthetic principles or genre. (3 cr)

ENG 4636 Contemp Amer Women's Poetry The work of American women poets from the last forty years. Diversity 2 requirement. (3 cr) *Last offered: Spring 1999.*

ENG 4640 Contemp Amer Women's Lit Writings by women from WW II to the present. Works by Ann Petry, Maxine Hong Kingston, Toni Morrison, Joyce Carol Oates, Kathy Acker, Bobby Ann Mason, and others. Diversity 2 requirement. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

ENG 4645 Post Modern Amer Fiction Experimental narratives by American writers of the last four decades. Works by Vladimir Nabokov, Thomas Pynchon, Ishmael Reed, Don DeLillo, Joanna Russ, and others. (3 cr) *Last offered: Summer 2001, Summer 2000, Fall 1996.*

ENG 4646 Race & Ethnicity: Amer Novel Introduction to a variety of canonical texts that treat questions of race and ethnicity. the critical role of language and literature play in determining how racial categories are constructed and deconstructed. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999.*

ENG 5000 Senior Seminar Capstone experience combining immersion in primary and secondard materials with an intensive writing experience. Limit of 15 students. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ETH 2050 Eth Trad & Contemp Life Major Western ethical traditions as they apply to selected contemporary ethical problems, with special consideration to Jewish and Christian perspectives. This course satisfies the Arts and Sciences Writing Enriched requirement. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

ETH 2051 Service Learning Practicum Ethics Service Learning Practicum that will meet one hour each week for reflection/critique of required service commitment. Permission of the instructor. (1 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*

ETH 3000 Integrating Seminar This is a capstone course which integrates many of the themes of the concentration. It is required for all concentrators in addition to the course requirements listed in catalog. (3 cr) *Last offered: Spring 2001, Spring 2000.*

FIN 1113 Principles of Finance The theory and techniques of financial management. Time value of money; risk and return; financial analysis and planning; working capital management, capital budgeting; cost of capital; strategic long term financing decisions. Junior or senior standing. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.* Prerequisites: ACC 1101 and DIT 2010 or (STA 2108) and DIT 2006 or (MGT 2006).

FIN 2114 Adv Financial Mgt Risk and return relationships; valuation models; cost of capital; capital structure; capital budgeting; dividend policy; international financial transactions; financial statement analysis and forecasting; working capital management. Emphasis on computer applications and case studies. Junior or senior standing. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: FIN 1113 or HON 1113.

FIN 2227 Financial Markets An introduction to the structure and operation of the money, capital, mortgage, derivatives, and international financial markets; flow of funds from savers to borrowers; efficiency of financial markets; theories of interest rates; term structure of interest rates. Junior or senior standing. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
Prerequisites: HON 1113 or FIN 1113.

FIN 2230 Financial Institutions The structure, operation, management, and regulation of commercial banks, savings and loan associations, mutual savings banks, credit unions, insurance companies, finance companies, pension funds, investment companies, and international financial institutions; structure and operation of the Federal Reserve system; measurement and management of the risks of financial institutions. Junior or senior standing. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: FIN 1113 or HON 1113.

FIN 2323 Intro to Investments Risk and return; organization of securities markets; term structure of interest rates; valuation of bonds; bond trading; valuation of common stock using fundamental and technical analysis; options, warrants, and financial futures; real estate; precious metals. Junior or senior standing. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
Prerequisites: FIN 1113 or HON 1113.

FIN 2324 Portfolio Management Advanced investment management with an emphasis on portfolio management; forecasting economic conditions; risk-return characteristics of securities; asset allocation (optimization) techniques; selecting investment goals; evaluating portfolio performance; international diversification; portfolio management with options and futures; computer applications in investment management. Senior standing. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: FIN 2323.

FIN 2335 Intl Financial Management The financial operations of multinational corporations and financial institutions with an emphasis on the international financial environment, foreign exchange risk management, multinational working capital management, foreign investment analysis, financing foreign operations, and international banking. Junior or senior standing. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.* Prerequisites: FIN 1113 or HON 1113.

FIN 2340 Contemporary Topics in Finance Contemporary issues and topics in Financial Management, Financial Markets, Investments, or International Finance. Senior Standing (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
Prerequisites: .

FIN 3350 Finance Internship Employment with an approved firm in the area of Finance where experience is gained with appropriate training, instruction, and supervision. Course does not fulfill the requirements for major. Prerequisites: Finance major with junior or senior standing, a minimum GPA of 2.5, approval of the office of Business Relations, and written permission of the chairperson. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

FIN 3360 Independent Study - Finance Independent study under a faculty member's guidance in an area of special interest to the student. The area of interest must be discussed with the faculty member prior to registration. Course does not fulfill the requirements for major. Prerequisites: Finance major with senior standing, and written permission of chairperson required. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

FRE 1111 Introductory French I Groundwork in French, including oral proficiency, aural comprehension and reading; for students with no prior knowledge of French, or one year of high school French. Supplementary language laboratory work and oral drills. (4 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

FRE 1112 Introductory French II Groundwork in French, including oral proficiency, aural comprehension and reading; for students with no prior knowledge of French, or one year of high school French. Supplementary language laboratory work and oral skills. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

FRE 1113 French-Reading Knowledge Essentials of grammar and exercises in expository French prose to prepare students for independent research in specialized fields. (0 cr) *Last offered: Spring 1998, Spring 1997, Spring 1996, Spring 1995.*

FRE 1121 Intermediate French I Review of grammar, composition, reading and conversation. Students should have completed FRE 1111 and 1112 or the equivalent. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

FRE 1122 Intermediate French II Review of grammar, composition, reading and conversation. Students should have completed FRE 1121 or the equivalent. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

FRE 1131 Conversation and Composition I Intense practice in conversation and composition with emphasis on developing advanced language skills in French. A writing enriched course. Students should have completed FRE 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

FRE 1132 Conversation & Composition II Intense practice in conversation and composition with emphasis on developing advanced language skills in French. A writing enriched course. Students should have completed FRE 1131 or the equivalent. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

FRE 1133 Practical French I Business and professional writing and readings in applicable publications. Students should have completed FRE 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

- FRE 1134 Practical French II** Business and professional writing and readings in applicable publications. Students should have completed FRE 1121 and 1122 or the equivalent. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*
- FRE 1135 Advanced Grammar** Systematic grammar analysis with comprehensive exercises and compositions. A writing enriched course. Students should have completed FRE 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 1995.*
- FRE 1136 Contemp Fren Lang I** Offered as part of the Villanova Summer Program at the University of Bourgogne/Dijon to provide practice in speaking and writing on an advanced level. The use of French in everyday situations and subject-related discussions. Students will read newspapers, magazines, advertising, and listen to broadcasts. (3 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.*
- FRE 1137 Cont Fre Lang II** Offered as part of the Villanova Summer Program at the University of Bourgogne/Dijon to provide practice in speaking and writing on an advanced level. The use of French in everyday situations and subject-related discussions. Students will read newspapers, magazines, advertising, and listen to broadcasts. (3 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.*
- FRE 1141 Phonetics** This course is an introduction to articulatory phonetics, phonologic analysis, and phonetization of phonemes. It comprises theoretical rules of spoken French and phonetic transcription as well as individual correction and auditory training. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*
- FRE 2100 French Lit in Eng Translation** The major works of French literature in translation. translation. Conducted in English. Fulfills advanced literature requirements. (3 cr)
- FRE 2101 French Lit & Film** Study of evolutionary relationship between 19th century realist Novel, pre-war poetic realism in film, post-war Nouveau Roman and Nouvelle vague cinema. Fulfills advanced literature requirements. (3 cr)
- FRE 2142 French Civilization** Study of French culture in its manifold aspects. Students should have completed FRE 1121 and 1122 or the equivalent. (3 cr) *Last offered: Summer 2001, Spring 2001, Spring 2000, Spring 1999.*
- FRE 2143 Contemporary France** Offered as part of the Villanova Summer Program at the University of Bourgogne/Dijon. France's current role in the international, political, economical and cultural world, and its impact in the EEC. Oral presentations and independent research required. (3 cr) *Last offered: Summer 2001, Summer 2000, Summer 1999, Summer 1998.*
- FRE 2144 Explication des textes** Close analyses of and textual commentary on representative selections. Students should have completed FRE 1131 and 1132 or the equivalent. Required course for French majors. Fulfills advanced literature requirements. (3 cr) *Last offered: Summer 2001, Fall 2000, Summer 2000, Summer 1999.*
- FRE 2215 French Women Writers** French women writers from the Middle Ages to the present. A writing enriched course. Satisfies Diversity Requirement. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 2000, Fall 1998, Fall 1996.*
- FRE 2218 Intro to Franco Phone Lit** Representative selections of French writers of Black Africa, North Africa, the Caribbean, and Canada. Topic to be announced. Satisfies Diversity Requirement. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 2001, Fall 1999, Fall 1997, Fall 1995.*
- FRE 3211 Survey of French Lit I** Close readings of representative texts from the Middle Ages to the 18th Century. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements, (3 cr) *Last offered: Fall 1996, Spring 1995.*
- FRE 3212 Survey of French Lit II** Close readings of representative texts from the 18th century to the 20th century. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1997, Spring 1995.*
- FRE 3411 Medieval Literature** The earliest texts, the chanson de geste, the romance, lyric, didactic, allegorical and satirical poetry and the prose writers of the Middle Ages. Fulfills advanced literature requirements. (3 cr)
- FRE 3412 Special Topics** Advanced study of topics of special interest in French literature. Topics to be arranged. Course may be repeated for credit. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*
- FRE 3512 The Renaissance** The Pleiade and the prose writers of the 16th Century. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- FRE 3613 17th Century Literature** Analytical readings of major non-dramatic texts, 1620- 1690. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- FRE 3614 Classical Theatre** Classical dramaturgy and modern interpretations of Corneille, Moliere and Racine. A writing enriched course. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- FRE 3715 18th Cent Literature I** Study of the Enlightenment through the theater, novels and philosophical texts with special emphasis on Voltaire. Voltaire. A writing enriched course. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 2001, Fall 1998.*

- FRE 3716 18th cent Literature II** Philosophical, revolutionary and sentimental writings with special emphasis on Rousseau. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 1999, Spring 1995.*
- FRE 3717 18th-19th Century Theatre** Development of the French theatre from the Classical tradition of the eighteenth century to the Romantic drama of the nineteenth. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- FRE 3818 Romanticism** The poetry, novel, short story and drama of the romantic period. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- FRE 3819 Realism & Naturalism** Realism and naturalism in the French novel and theatre with emphasis on Balzac, Flaubert and Zola. Fulfills advanced literature requirements. (3 cr)
- FRE 3820 Post Romantic Poets** The development of French poetry and poetic theory from Baudelaire to Mallarme. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- FRE 3921 20th Century Theatre** Major stage works in text and performance from Jarry to Koltes. Students should have completed FRE 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1996.*
- FRE 3922 20th Century Novel** Development of the novel in the first half of the 20th Century with emphasis on Proust, Gide, Mauriac, Green, etc. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 2001, Fall 1997.*
- FRE 3923 Post-World War II Writers** French Literature since 1945, with emphasis on the novels and essays of Sartre, Simone de Beauvoir, Camus, Robbe-Grillet, and Le Clézio. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1999, Fall 1995.*
- FRE 3950 Research Seminar** Bibliographical principles and the techniques of literary research; preparation of a paper. Writing Intensive. Require course for French majors. Fulfills advanced literature requirements. (1 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- FRE 4110 French Classical Theatre** Readings and discussions on the major dramatists and theorists of the French 17th century. Conducted in English. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 1997.*
- FRE 4120 Modern French Theatre** The contemporary drama of France from its origin (King Ubu) to Beckett, Sartre, Genet, Ionesco and recent dramatists. Conducted in English. Fulfills advanced literature requirements. (3 cr)
- FRE 4130 The Modern French Novel** The search for identity and meaning in contemporary French fiction from Gide to Camus, Sartre and the new novelists. Conducted in English. Fulfills advanced literature requirements. (3 cr)
- GEO 1001 Internat'l Approach Geography** The human and physical realms of Geography. Focus on current geographic problems facing specific regions of the world. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- GEO 1500 Physical Geography** World climates, water, landforms, soil, and vegetation form the basis of this global environmental approach. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- GEO 1700 Cartography** From the concept of mental mapping to computer cartography, integrated with a series of hands-on (3 cr) *Last offered: Summer 1999, Spring 1997, Fall 1996, Summer 1996.*
- GEO 1903 Internship Elective** (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- GEO 1906 Internship Elective** (6 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- GEO 1909 Internship Elective** (9 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- GEO 2000 Political Geography** Spatial attributes of political process and structure, with an emphasis on current geo-political issues in the world. (3 cr)
- GEO 2100 Economic Geography** Locational analysis of the major agricultural, manufacturing, and service industries in an increasing interdependent world. (3 cr) *Last offered: Fall 1995.*
- GEO 2200 Urban Geography** The location, structure, functions and growth problems of cities; possible solutions for preserving or restoring a livable urban environment. (3 cr) *Last offered: Fall 2000, Fall 1999, Fall 1998, Fall 1997.*
- GEO 2300 Population Geography** Spatial patterns of human population; population size, growth, and characteristics; vital statistics, projection and forecasting techniques, the relationship of population to environmental problems. (3 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997.*
- GEO 2993 Internship** (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- GEO 2996 Internship** (6 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*
- GEO 3500 North America** The physical and cultural environments of the United States and Canada. (3 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Summer 1999.*

GEO 3600 Europe The strengths and weaknesses and the human and natural resources of Europe and the Common Market. (3 cr)

GEO 3700 Africa Major geographic problems facing contemporary Africa, with a special emphasis on spatial planning within a number of national contexts. (3 cr) *Last offered: Spring 2001, Spring 2000, Fall 1999, Summer 1999.*

GEO 3800 Islamic World The physical environments and life patterns of the Islamic peoples in Asia and Africa. The historical and contemporary interrelationship between the Islamic World and the West. (3 cr) *Last offered: Summer 1998, Summer 1996, Spring 1996.*

GEO 3900 Geography of Asia A regional study of the physical environment, culture, and development of Asia. (3 cr) *Last offered: Fall 2000, Spring 1999, Spring 1996.*

GEO 4050 Air Photo Interpretation Basic skills necessary to identify a variety of phenomena on aerial photographs employing a number of film types. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1998, Spring 1997.*

GEO 4101 Geographic Info Systems Principles and applications of Geographic Information Systems (GIS), with an emphasis on vector data structures and relational data base management systems. Pc-based GIS provides experience with methods to store, retrieve, manipulate and manage spatial and associated attribute information in solving geographic problems. (3 cr) *Last offered: Fall 2001, Spring 2000, Fall 1998, Fall 1997.*

GEO 4250 Remote Sensing The technology used to produce reliable interpretive data about objects and environmental phenomena by recording, analyzing, and interpreting wave/force fields and patterns of transmitted, reflected, and emitted energy. New developments in imaging techniques, particularly those related to satellite, thermal infrared and radar sensor systems. (3 cr) *Last offered: Spring 2000, Spring 1999, Spring 1998, Spring 1997.*

GEO 4300 Advanced Cartography The study and practical experience map production from conception to color proofing. Students design and execute maps of publishable quality. (3 cr)

GEO 5100 Resource Mangt & Conservation Problems and policies arising from the use and misuse of the environment; assessment of the consequences of applying various policies, and the development of an environmental/resource ethic. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 1999, Summer 1999.*

GEO 5200 Geo of Land Use Management Land-use decisions and policies: agricultural, recreational, nuclear, urban, and industrial environments. (3 cr) *Last offered: Spring 1999, Fall 1996.*

GEO 5300 Disasters: Nat Hazards Environmental hazards that threaten health and safety at national and global levels. Mechanics, distributions, risks, mitigation control and case histories for each major hazard: earthquakes, tsunamis, volcanoes, coastal erosion, avalanches, tornadoes, hurricanes, flooding, and subsidence. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

GEO 6000 Geography Seminar Student research on the historical development of geographic thought. (3 cr) *Last offered: Spring 1996, Spring 1995.*

GEO 6001 Seminar Geographic Educ Readings on teaching and learning, historic and contemporary, with emphasis on geographic education. Students assist in some lower division courses and evaluate teaching philosophies and methodologies. Restricted to geography majors. (3 cr)

GEO 6100 Geography Seminar Student research on trends in current geographic literature. (3 cr) *Last offered: Fall 1998, Spring 1995.*

GEO 6200 Independent Study Individual projects or studies in geography. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

GER 1111 Introductory German I Groundwork in German, including oral, aural and reading skills. Supplementary oral drills. (4 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

GER 1112 Introductory German II Groundwork in German, including oral, aural and reading skills. Supplementary laboratory work and oral drills. (4 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

GER 1113 German for Translation Essentials of grammar and exercise for reading comprehension and translation. (3 cr) *Last offered: Spring 2001, Spring 1999, Spring 1998, Spring 1997.*

GER 1121 Intermediate German I Review of grammar, composition, reading and conversation. Students should have completed GER 1111 and 1112 or the equivalent. (3 cr) *Last offered: Fall 2001, Summer 2001, Spring 2001, Fall 2000.*

GER 1122 Intermediate German II Review of grammar, composition, reading and conversation. Students should have completed GER 1121 or the equivalent. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*

GER 1131 Conversation & Composition I Intensive practice in conversation and composition with emphasis on developing advanced language skills in German. Writing enriched. Students should have completed GER 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 2001, Summer 2001, Fall 2000, Summer 2000.*

- GER 1132 Conversation & Composition II** Intensive practice in conversation and composition with emphasis on developing language skills in German. Writing enriched. Students should have completed GER 1131 or the equivalent. (3 cr) *Last offered: Summer 2001, Spring 2001, Summer 2000, Spring 2000.*
- GER 1133 Business German I** Business and professional writing and readings in applicable publications. Students should have completed GER 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 2001, Spring 2001, Spring 2000, Fall 1999.*
- GER 1134 Business German II** Business and professional writing and readings in applicable publications. Students should have completed GER 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 1998, Spring 1997.*
- GER 1135 Practical German I** Intercommunication with supplemental readings in newspapers and magazines. Students should have completed GER 1121 and 1122 or the equivalent. (3 cr) *Last offered: Summer 2001, Summer 2000, Summer 1995.*
- GER 1136 Practical German II** Intercommunication with supplemental readings in newspapers and magazines. Students should have completed GER 1121 and 1122 or the equivalent. (3 cr) *Last offered: Summer 2001, Summer 2000, Summer 1995.*
- GER 2100 German Lit in Engl Translation** The major works of German literature in translation. Conducted in English. Fulfills advanced literature requirements. (3 cr)
- GER 2142 Ger Civ and Culture to 1989** Study of German civilization and culture from their beginnings until the fall of the Berlin Wall. (3 cr) *Last offered: Spring 1998, Fall 1996, Spring 1995.*
- GER 2143 Ger Civ & Culture Since 1989** Contemporary German civilization and culture in their manifold aspects. Students should have completed GER 1121 and 1122 or the equivalent. (3 cr) *Last offered: Fall 1997.*
- GER 3211 Survey of German Lit I** From its beginnings to 1750. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- GER 3212 Survey of German Lit II** From 1750 through 1900. Students should have completed GER 1131 or the equivalent. (3 cr) *Last offered: Fall 1999, Fall 1995.*
- GER 3213 Survey of German Lit III** From 1900 through 2000. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1996.*
- GER 3411 Medieval Masterpieces** Selections from medieval German literature read in modern German. Fulfills advanced literature requirements. (3 cr)
- GER 3412 Special Topics** Topics of interest in German literature. Topics to be arranged. Course may be repeated for credit. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 2001, Spring 2001, Fall 2000, Spring 2000.*
- GER 3714 Enlightenment to Romanticism** Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1997.*
- GER 3716 Goethe** Study of selected works. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- GER 3717 German Drama in 19th Century** The German drama from Romanticism to Naturalism, with emphasis on the major dramatic works of Kleist, Grillparzer, Büchner and Hebbel. Fulfills advanced literature requirements. (3 cr)
- GER 3718 The German Novelle** The German Novelle as a genre from Goethe to the 20th century. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- GER 3818 Romanticism** The philosophy, lyric and prose of the Romantic period. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr)
- GER 3819 Realism** The major works of Poetic Realism. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1995.*
- GER 3920 Austrian Literature** Selected works of Austrian literature from 1850 to the present. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 2001, Summer 2000, Spring 1999, Fall 1995.*
- GER 3921 20th Century Drama** German drama from Naturalism to the present. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1999, Fall 1998, Summer 1995.*
- GER 3922 20th Century Prose I** Novels and short stories. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 1998, Fall 1996.*
- GER 3923 20th Century Prose II** Novels and short stories. Students should have completed GER 1131 or the equivalent. Fulfills advanced literature requirements. (3 cr) *Last offered: Spring 1997.*
- GER 3950 Research Seminar** Bibliographical principles and the techniques of literary research; preparation of a paper. Writing intensive. Fulfills advanced literature requirements. (1 cr) *Last offered: Spring 2001, Fall 2000, Spring 2000, Spring 1999.*

GER 4110 German Epic Theatre Evolution of the genre culminating in the political documentary theatre. Conducted in English. Fulfills advanced literature requirements. (3 cr)

GER 4120 German Theatre and Film Plays by Brecht, Hasenclever, Kaiser, etc. Films such as Caligari, Nosferatu, Metropolis, M. Conducted in English. Fulfills advanced literature requirements. (3 cr)

GER 4140 150 Years of German Drama The main currents in German drama evolving into the modern period: Kleist, Grillparzer, Hebbel, Hauptmann, Kaiser, Brecht, Frisch, Duerrenmatt. Conducted in English. Fulfills advanced literature requirements. (3 cr)

GER 4150 German Culture & Civilization The culture and civilization of the German-speaking countries. Conducted in English. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 1999.*

GLY 2805 Geology for Engineers Development and composition of minerals, rocks and soils; geologic structure and deformation of rock masses; weathering, mass wasting, erosion, groundwater, streams, ocean currents and glaciers. (3 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.* Prerequisites: CEE 2602.

GRK 1001 Intro Greek Ancient I The basic forms, syntax and vocabulary of Ancient Attic Greek; selected prose in second semester. (5 cr) *Last offered: Fall 2001, Fall 2000, Fall 1999, Fall 1998.*

GRK 1002 Elementary Greek II The basic forms, syntax and vocabulary of Ancient Attic Greek; selected prose in second semester. (5 cr) *Last offered: Spring 2001, Spring 2000, Spring 1999, Spring 1998.*

GRK 1051 New Testament Greek I Essentials of the grammar, syntax and vocabulary of the Greek of the New Testament. Reading and writing of simple New Testament Greek. (5 cr)

GRK 1052 New Testament Greek II Essentials of the grammar, syntax and vocabulary of the Greek of the New Testament. Reading and writing of simple New Testament Greek. (5 cr)

GRK 3001 Readings in Authors Selected readings from a variety of Greek authors. Fulfills advanced literature requirements. (3 cr) *Last offered: Fall 2001, Fall 2000, Spring 1997.*