AASP — Afro-American Studies

AASP 100 Introduction to Afro-American Studies (3)
Significant aspects of the history of Afro-Americans with particular emphasis on the evolution and development of black communities from slavery to the present. Interdisciplinary introduction to social, political, legal and economic roots of contemporary problems faced by blacks in the United States with applications to the lives of other racial and ethnic minorities in the Americas and in other societies.

AASP 101 Public Policy and the Black Community (3)
Formerly AASP 320. The impact of public policies on the black community and the role of the policy process in affecting the social, economic and political well-being of minorities. Particular attention given to the post-1960 to present era.

AASP 200 African Civilization (3)
A survey of African civilizations from 4500 B.C. to the present. Analysis of the effects of colonization on these civilizations. Analysis of the influence of traditional African social systems on modern African institutions as well as discussion of contemporary processes of Africanization.

AASP 202 Black Culture in the United States (3)
The course examines important aspects of American Negro life and thought which are reflected in Afro-American literature, drama, music and art. Beginning with the cultural heritage of slavery, the course surveys the changing modes of black creative expression from the 19th-century to the present.

AASP 298 Special Topics in Afro-American Studies (3)
Repeatable to 6 credits if content differs. An introductory multidisciplinary and interdisciplinary educational experience to explore issues relevant to black life, cultural experiences, and political, economic and artistic development.

AASP 299 Selected Topics in Afro-American Studies (1-3)
Repeatable to 6 credits if content differs. An introductory multidisciplinary academic exploration of the cultural, political, and economic issues relevant to Africans and African-Americans.

AASP 301 Applied Policy Analysis and the Black Community (3)
Prerequisite: [AASP 101 and ECON 201] or [AASP 101 and ECON 203]. Recommended: one semester of statistics. Development and application of the tools needed for examining the effectiveness of alternative policy options confronting minority communities. Review policy research methods used for formulating and evaluating policies. Examination of the policy process.

AASP 303 Computer Applications in Afro-American Studies (3)
Prerequisite: STAT 100 or SOCY 201 or MATH 111 or equivalent. Introduction to statistics and database processing software used in model estimation and simulation in policy analysis. Special emphasis on applications for applied research on policy problems confronting minority communities.

AASP 305 Theoretical, Methodological and Policy Research Issues in Afro-American Studies (3)
Prerequisites: AASP 301 and MATH 111 or STAT 230 or PSYC 200 or SOCY 201 or ECON 321 or equivalent course with permission of department. Formerly AASP 401. Theories and concepts in the social and behavioral sciences relating to problems in minority communities. Issues include validity and soundness of theoretical arguments, epistemological questions of various methodologies and the relationship between policy making and policy research.

AASP 310 African Slave Trade (3)
Prerequisite: AASP 100 or AASP 202 or permission of department. Formerly AASP 311. The relationship of the slave trade of Africans to the development of British capitalism and its industrial revolution; and to the economic and social development of the Americas.

AASP 311 Social and Cultural Effects of Colonization and Racism (3)
Prerequisite: AASP 100 or AASP 202. A comparative approach to the study of the social and cultural effects of colonization and racism on black people in Africa, Latin America and in the United States—community and family life, religion, economic institutions, education and artistic expression.

AASP 314 The Civil Rights Movement (3)
Prerequisite: AASP 100 or HIST 157. Survey of the twentieth-century civil rights movement from the desegregation of UM Law School through the National Black Political Congress in Gary in 1972. Major themes include leadership, legal and constitutional challenges, non-violence, Black Power, Pan-Africanism.

AASP 398 Selected Topics in the African Diaspora (3)
Repeatable to 6 credits if content differs. Analysis of the historical experiences and cultures of Africans in the Diaspora.

AASP 400 Directed Readings in Afro-American Studies (3)
Prerequisite: AASP 100 or AASP 202. Directed research in Afro-American Studies resulting in the completion and defense of a senior thesis.

AASP 402 Classic Readings in Afro-American Studies (3)
Prerequisite: AASP 100 or AASP 202. Classic readings of the social, economic and political status of blacks and other minorities in the United States and the Americas.

AASP 411 Black Resistance Movements (3)
Prerequisite: AASP 100. A comparative study of the black resistance movements in Africa and America; analysis of their interrelationships as well as their impact on contemporary pan-Africanism.

AASP 441 Science, Technology, and the Black Community (3)
Prerequisite: AASP 100 or AASP 202 or HIST 255 or equivalent course with permission of department. The relationship between black communities and the law, particularly criminal law, criminal institutions and the criminal justice system. Examines historical changes in the legal status of blacks and changes in the causes of racial disparities in criminal involvement and punishments.

AASP 468 Special Topics in Africa and the Americas (3)
Repeatable to 6 credits if content differs. Cultural, historical and artistic dimensions of the African experience in Africa and the Americas.

AASP 478 Humanities Topics in Afro-American Studies (3)
Repeatable to 6 credits if content differs. Advanced studies in the humanities, often requiring prerequisites, focusing on the literary, artistic and philosophical contributions of Africans and African-Americans.

AAGR — Agricultural and Natural Resources

AAGR 105 Introduction to Agriculture and Natural Resources (1)
Formerly AGRI 105. Technical and human components of agriculture in a cross-disciplinary context. Agricultural origins, crop and animal domestication, agricultural geography, food and nutrition, the natural resource base and environmental concerns, agricultural policy formation, agricultural marketing and trade, sustainable agriculture, international agriculture, and the future of farming.

AAGR 302 Introduction to Agricultural Education (2)
Formerly AGRI 302. An overview of the job of the teacher of agriculture; examination of specific areas of policy development and evaluation in black and other communities. Application of advanced tools of policy analysis, especially quantitative, statistical and micro-economic analysis.

AGNR — Agriculture and Natural Resources

AGNR 101 Teaching Young and Adult Farmer Groups (1)
AGNR 302 Introduction to Agricultural Education (2)
AGNR — Agriculture and Natural Resources

AGNR 302 Introduction to Agricultural Education (2)
Formerly AGRI 302. An overview of the job of the teacher of agriculture; examination of specific areas of policy development and evaluation in black and other communities. Application of advanced tools of policy analysis, especially quantitative, statistical and micro-economic analysis.

AGNR 305 Teaching Young and Adult Farmer Groups (1)
Formerly AGRI 305. Characteristics of young and adult farmer instruction in agriculture. Determining needs for and organizing a course; selecting materials for instruction; and class management. Emphasis is on the conference method of teaching.
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AMST 398 Independent Studies (1-3) Prerequisite: permission of department. Repeatable to 6 credits. Provides the student with the opportunity to pursue independent, interdisciplinary research and reading in specific areas of American culture studies.

AMST 418 Cultural Themes in America (3) Repeatable to 6 credits if content differs. Seminar which examines the structure and development of American culture through themes such as "growing up American," "culture and mental disorders," "race," "ethnicity,'" regionalism," "landscape," "homer.

AMST 428 American Cultural Eras (3) Repeatable to 6 credits if content differs. Seminar which examines the development of American thought and culture and the critical issues and events that shaped it in the antebellum, civil war, and post-war periods. Prerequisite: AMST 201. Formerly AMST 201.

AMST 429 Perspectives on Popular Culture (3) Repeatable to 6 credits if content differs. Seminar which examines the development of American thought and culture and the critical issues and events that shaped it in the antebellum, civil war, and post-war periods. Prerequisite: AMST 201. Formerly AMST 201.

AMST 432 Literature and American Society (3) Prerequisite: prior course in AMST, SOCY, American literature, or American history. Examination of the relationship between literature and society. Including literature as cultural communication and the institutional framework governing its production, distribution, conservation and evaluation.

AMST 450 Seminar in American Studies (3) Prerequisite: nine hours prior coursework in American Studies, including AMST 201, Seminar. Focus on contemporary issues in American studies, with emphasis upon interaction between the humanities and the social sciences in the process of cultural analysis and evaluation.

ANSC — Animal Science

The following courses may involve the use of animals. Students who are concerned about the use of animals in teaching have the responsibility to contact the instructor, prior to course enrollment, to determine whether animals are to be used in the course, whether class exercises involving animals are optional or required, or if any, are available.

ANSC 101 Principles of Animal Science (3) Two hours of lecture and two hours of laboratory per week. A comprehensive course, including the development of animal science, its contributions to the economy, characteristics of animal products, factors of efficient and economical production and distribution.

ANSC 102 Animal Products Safety and Processing (3) Two hours of lecture and two hours of laboratory per week. Recommended for majors in the food science industry. Covers the FDA regulations and quality control issues that relate to animal production and processing practices. The course will familiarize students with the processing industries responsible for the production of animal and food products. Emphasis will be on illustrating how animal production and processing practices can have significant effects on the safety of animal food products.

ANSC 180 Introduction to Dairy Foods (2) One hour of lecture and two hours of laboratory per week. A laboratory course designed to provide an overview of food safety issues that relate to animal production and processing practices. The course will familiarize students with the processing industries responsible for the production of animal and food products. Emphasis will be on illustrating how animal production and processing practices can have significant effects on the safety of animal food products.

ANSC 211 or equivalent. The physiology of domesticated animals. Special emphasis is placed on the systems important in animal production.

ANSC 222 Meats (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: ANSC 215. Formerly ANSC 215. Meat and the factors influencing acceptability, marketing, and quality of fresh meats. Laboratory periods are conducted in packing houses, meat distribution centers, retail outlets and University Meats Laboratory.

ANSC 230 Equine Science (3) Prerequisite: ANSC 101. For students who intend to be involved in the care and management of horses. The principles of nutrition, anatomy, physiology, health, breeding, locomotion and management techniques are emphasized.

ANSC 231 Equine Science Practicum (1) Pre- or corequisite: ANSC 230. Formerly ANSC 431. Application of the principles discussed in ANSC 230 to the management of horses focusing on an equine practice associated with small business operations in the horse industry.

ANSC 240 Dairy Cattle Management (2) Prerequisite: ANSC 220. All aspects of dairy production, including nutrition, reproduction, mastitis control, milking management, farmstead facilities, financial management and forage production.

ANSC 241 Dairy Cattle Management Practicum (1) Three hours of laboratory per week. Prerequisite: ANSC 240. Formerly ANSC 242. Practicum to parallel ANSC 240. Field trips required.

ANSC 244 Dairy Cattle Type Appraisal (1) Two laboratory periods. Prerequisite: ANSC 230. Includes systems and tools for the analysis of dairy cattle type with emphasis on the comparative judging of dairy cattle.

ANSC 251 Beef and Sheep Management (3) Three hours of laboratory per week. Prerequisite: ANSC 220. Credit will be granted for ANSC 220 or ANSC 244. Formerly ANSC 424. Practicum to parallel ANSC 220. Field trips required.

ANSC 252 Introduction to the Diseases of Wildlife (3) Two hours of lecture and one hour of discussion/recitation per week. Prerequisite: BIOL 105. Formerly ANSC 252. The principal diseases of North American wildlife will be briefly considered. For each disease, specific attention will be given to the following: signs evidenced by the affected animal or bird, causal agent, means of transmission and effects of the disease on the population of the species involved.

ANSC 262 Commercial Poultry Management (3) Prerequisite: ANSC 101. A symposium of finance, investment, Plant layout. Specialization, purchase of supplies and management problems in baby chick, egg, broiler and turkey production; foremanship, advertising, selling, byproducts, production and financial records. Field trips required.

ANSC 271 Swine Management Practicum (1) Three hours of laboratory per week. Prerequisite: ANSC 220. Formerly ANSC 421. Practicum to parallel ANSC 220. Field trips required.

ANSC 289 Animal Agriculture Tour (1) Three hours of lecture and two hours of laboratory per week. Prerequisite: BIOL 105. Includes systematics, anatomy, physiology, behavior, life histories, ecology, population dynamics, evolution and conservation of birds.

ANSC 305 Comparative Animal Nutrition (3) Prerequisites: ANSC 101 and (CHEM 104 or CHEM 233). Formerly ANSC 215. Nutrients and their optimal intake levels, their metabolism, in relation to their biochemical role in metabolism, digestion, absorption, and their deficiency symptoms.

ANSC 315 Animal Applied Nutrition (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: ANSC 215. Formerly ANSC 215. Application of animal nutrition principles to the formulation of diets intended to meet the nutrient requirements of various livestock species. Emphasis on understanding the roles of various classes of feeds. A study of the composition of feeds, nutrient requirements of various species, and the development of Feeds for the United States.
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ANTH 220 Introduction to Biological Anthropology (4)
Three hours of lecture and two hours of laboratory per week. Credit will be granted for only one of the following: ANTH 101 or ANTH 220. Formerly ANTH 101. Human biological evolution, including the biology of contemporary human groups, non-human primate social behavior, and the fossil, biochemical, and molecular evidence of human evolution. Includes a laboratory study of human population genetics, biochemical variation, and anatomical diversity in modern and fossil human and non-human primate groups.

ANTH 240 Introduction to Archaeology (3)
Credit will be granted for only one of the following: ANTH 240 or ANTH 241. Formerly ANTH 241. Exploration of the variety of past human activities, and the understanding of cultural change and meaning. Includes research design and execution (from survey through excavation and a survey of the reconstruction of aspects of past cultures and the understanding of cultural change and meaning.

ANTH 320 Human Evolution (4)
Prerequisite: ANTH 220. Credit will be granted for only one of the following: ANTH 320 or ANTH 26. Formerly ANTH 320. Human evolution, focusing on the divergence of hominids from the pongid line to modern human (Homo sapiens). Emphasis on current debates, new directions, and their historical antecedents.

ANTH 340 Method and Theory in Archaeology (3)
Prerequisite: ANTH 240. Credit will be granted for only one of the following: ANTH 342 or ANTH 451. Formerly ANTH 451. Prehistoric and European cultures in North and South America, with a focus on the means of archaeological interpretation.

ANTH 360 Method and Theory in Sociocultural Anthropology (3)
Prerequisite: ANTH 260. Theoretical approaches to sociocultural anthropological research. Emphasis on current debates, new directions, and their historical antecedents.

ANTH 360 Diversity in Complex Societies (3)
Prerequisite: ANTH 260 or permission of department. Methodological and theoretical approaches in anthropological research on complex societies. Focus on the reconstruction of aspects of past cultures and the understanding of cultural change and meaning.

ANTH 368 Regional Ethnography (3)
Prerequisite: ANTH 260 or permission of department. Repeatable to 6 credits if content differs. Examination of current developments in the animal sciences.

ANTH — Anthropology

ANTH 425 Applied Biological Anthropology (3)
Prerequisite: ANTH 220 or ANTH 240 or ANTH 260. Formerly ANTH 220. The use of biological anthropology as a tool for research into a current problem in anthropology, selected with the topic; check with the department for requirements.

ANTH 460 Interpretive Anthropology (3)
Prerequisite: ANTH 260 or permission of department. Anthropological approaches that seek to explain social behavior, the meaning and their relationships to other aspects of social life.

ANTH 460 Kinship and Social Organizations (3)
Prerequisite: ANTH 260. Formerly ANTH 360. Credit will be granted for only one of the following: ANTH 462 or ANTH 431. Cross-cultural analysis of social organization at multiple levels. Includes a laboratory survey of the basic principles of sociocultural systems. It will employ methods and insights derived from historical data, as well as those resulting from a wide range of intensive ethnographic inquiries.

ANTH 464 Development Anthropology (3)
Prerequisite: ANTH 260 or permission of department. Repeatable to 6 credits if content differs. Examination of current developments in the animal sciences.

ANTH 468 Special Topics in Cultural Anthropology (3)
Prerequisite: ANTH 360 or permission of department. Repeatable to 6 credits if content differs. Advanced courses in anthropological traditions or topics dealing with new theoretical developments, faculty research interests, or the specialties of visiting scholars. Prerequisites or background knowledge vary with the topic; check with the department for requirements.

ANTH 440 Historical Archaeology (3)
Prerequisite: ANTH 240. The expansion of European culture through colonization of the Americas and countries east of the Mississippi River, explored through material remains and artifacts from areas that may include Africa, India, South Africa, Australia, and the Western Hemisphere.

ANTH 448 Special Topics in Archaeology (3)
Prerequisite: ANTH 240. Repeatable to 6 credits if content differs. Advanced topics in archaeological research, corresponding to new theoretical developments, faculty research interests, or the specialties of visiting scholars. Prerequisites or background knowledge vary with the topic; check with the department for requirements.

ANTH 450 Resource Management and Cultural Process (3)
Junior standing. Also offered as ANTH 650. Credit will be granted for only one of the following: ANTH 450 or ANTH 650. Formerly ANTH 450. An introduction to the means of archaeological interpretation.

ANTH 454 Anthropology of Travel and Tourism (3)
Review of recent anthropological contributions to the study of tourism and travel behavior. Topics include the political economy of tourism, gender in tourism, the built environment, ecotourism, and sustainable tourism development.

ANTH 460 Anthropology of Travel and Tourism (3)
Prerequisite: ANTH 260 or permission of department. Anthropological approaches to economic development, particularly the new sub-field of sustainable development. Examines the local-level social, political, and economic contexts of development and the potential for grassroots strategies to manage resources.

ANTH 468 Special Topics in Cultural Anthropology (3)
Prerequisite: ANTH 360 or permission of department. Repeatable to 6 credits if content differs. Advanced courses in anthropological traditions or topics dealing with new theoretical developments, faculty research interests, or the specialties of visiting scholars.

ANTH 470 History and Philosophy of Anthropological Inquiry (3)
Prerequisite: ANTH 220 or ANTH 240 or ANTH 260. Formerly ANTH 340 or ANTH 360 or ANTH 380. Credit will be granted for only one of the following: ANTH 470 or ANTH 397. Formerly ANTH 397. Important philosophical and historical aspects of anthropological theory. Theoretical and methodological approaches to anthropological research will be an exploration of the variety of past human activities, and the understanding of cultural change and meaning.

ANTH 470 History and Philosophy of Anthropological Inquiry (3)
Prerequisite: ANTH 220 or ANTH 240 or ANTH 260. Formerly ANTH 340 or ANTH 360 or ANTH 380. Credit will be granted for only one of the following: ANTH 470 or ANTH 397. Formerly ANTH 397. Important philosophical and historical aspects of anthropological theory. Theoretical and methodological approaches to anthropological research will be an exploration of the variety of past human activities, and the understanding of cultural change and meaning.

ANTH 477 Senior Thesis (3-4)
Prerequisite: ANTH 476. Credit will be granted for only one of the following: ANTH 477 or ANTH 486. Capstone course in which students write a senior thesis on independent research into a current problem in anthropology. The thesis is defined before a committee of faculty. Research leads to the writing of a senior thesis in anthropology.

ANTH 477 Senior Thesis (3-4)
Prerequisite: ANTH 476. Credit will be granted for only one of the following: ANTH 477 or ANTH 486. Capstone course in which students write a senior thesis on independent research into a current problem in anthropology. The thesis is defined before a committee of faculty. Research leads to the writing of a senior thesis in anthropology.

ANTH 478 Special Topics in Linguistics (3)
Prerequisite: ANTH 220 or ANTH 240 or ANTH 260. Formerly ANTH 340 or ANTH 360 or ANTH 380. Credit will be granted for only one of the following: ANTH 478 or ANTH 397. An introduction to the means of archaeological interpretation.

ANTH 482 Special Topics in Bio-anthropology (3)
Prerequisite: ANTH 220 or ANTH 240 or ANTH 260. Formerly ANTH 220. The use of biological anthropology as a tool for research into a current problem in anthropology, selected with the topic; check with the department for requirements.
ARCH 403 History of Islamic Architecture (3) Prerequisite: permission of department. Survey of Islamic architecture from the seventh through the 18th-century.

ARCH 437 History of Pre-Columbian Architecture (3) Architecture of Pre-Columbian Mexico and Central America from the PreClassical Period through the Spanish conquest.

ARCH 443 Visual Communication (2) Two hours of lecture and two hours of laboratory per week. Prerequisite: admission to ARCH 400 or equivalent and permission of department. The role of architectural design and the role of architectural design in the development of the architectural drawing. Investigation of the relationship between drawing from life and architectural drawing and the conventions of architectural drafting. The role of the architect in designing buildings, developing, and communicating, and generating architectural ideas.

ARCH 445 Visual Analysis of Architecture (3) Two hours of lecture and two hours of studio per week. Prerequisite: ARCH 401 and ARCH 434, or permission of department. Visual analysis of architectural designs.

ARCH 448 Selected Topics in Visual Studies (1-4) Prerequisite: permission of department. Repeatable to 7 credits if content differs.

ARCH 449 Independent Studies in Visual Studies (1-4) Repeatable to 6 credits. Proposed work must have a faculty sponsor and receive approval of the curriculum committee.

ARCH 450 Introduction to Urban Planning (3) Introduction to the planning theory, methods, and techniques of developing and dealing with normative, urban, structural, economic, social aspects of the city; urban planning as a process. Architectural majors only. Prerequisite: permission of the instructor. Lecture, seminar, 3 hours per week.

ARCH 451 Urban Design Seminar (3) Prerequisite: ARCH 350 or permission of department. Advanced investigation into problems of analysis and evaluation of the design of urban areas, spaces, and complexes. Emphasis on physical and social considerations, effects of public policies, through case studies. Field observations.

ARCH 453 Urban Problems Seminar (3) Prerequisite: ARCH 400 or permission of department. A case study of urban development issues, dealing primarily with socio-economic aspects of changes in the built environment.

ARCH 458 Selected Topics in Urban Planning (1-4) Prerequisite: permission of department. Repeatable to 7 credits if content differs.

ARCH 459 Independent Studies in Urban Planning (1-4) Repeatable to 6 credits. Proposed work must have a faculty sponsor and receive approval of the curriculum committee.

ARCH 460 Site Analysis and Design (3) Prerequisite: ARCH majors only or permission of department. Principles and methods of site analysis; the influence of natural and man-made environments upon site design and structural hands.

ARCH 470 Computer Applications in Architecture (3) Prerequisite: ARCH 400 or permission of department. Introduction to computer programming and utilization, with emphasis on architectural applications.

ARCH 472 Economic Determinants in Architecture (3) Integration to the economic factors in architectural form and design, including land economics, real estate, financing, project development, financial planning, construction and cost control.

ARCH 478 Selected Topics in Architecture (1-4) Prerequisite: permission of department. Repeatable to 7 credits if content differs.

ARCH 479 Independent Studies in Architecture (1-4) Repeatable to 6 credits. Proposed work must have a faculty sponsor and receive approval of the curriculum committee.

ARCH 480 Problems and Methods of Architectural Research (3) Prerequisite: ARCH 420 or permission of department. Theory and practice of preservation in America, with emphasis on the problems and techniques of community preservation.

ARCH 481 The Architect in Archaeology (3) Prerequisite: permission of department. The role of the architect in field archaeology and the analysis of excavating, recording, and publishing selected archaeological expeditions.

ARCH 482 The Archaeology of Roman and Byzantine Palestine (3) Archaeological sites in Palestine (Israel and Jordan) from the reign of Herod the Great to the Moslem conquest.

ARCH 483 Field Archaeology (3) Prerequisite: permission of department. Participation in field archaeology with an excavation officially recognized by proper authorities of local government.
ARHC 488 Selected Topics in Architectural Preservation (1-4) Prerequisite: permission of department. Repeatable to 6 credits if content differs.

ARHC 489 Independent Studies in Architectural Preservation (1-4) Repeatable to 6 credits. Proposed work must have a faculty sponsor and receive approval of the curriculum committee.

AREC — Agricultural and Resource Economics

AREC 182 Information from Economic Data, An Introduction (3) One hour of lecture and three hours of laboratory per week. Prerequisite: permission of department. STAT 100. Formerly AREC 382. Analyzing economic data using computer spreadsheets and other software. Topics include descriptive statistics, seasonal adjustment, market analysis, trend analysis, prediction and forecasting, etc. Prior experience with statistics and computer spreadsheets helpful but not required.

AREC 240 Introduction to Economics and the Environment (3) Prerequisite: ECON 306. Basic economic theory as applied to the marketing of agricultural products, including price, cost, and financial analysis. Current developments affecting market structure including vertical integration, governmental policies and regulation.

AREC 433 Food and Agricultural Policy (3) Prerequisite: ECON 306. Economic and political context of governmental involvement in the farm and food sector. Historical programs and current policy issues. Analysis of economic effects of agricultural programs, their benefits and costs, and comparison of policy alternatives. Analyzes the interrelationship among international, national, and institutional features of commodity futures and options markets. Students will develop a basic understanding of the underlying price relationships between cash and futures markets. Analysis of information to business risk management decision making.

AREC 445 Agricultural Development, Population Growth and the Environment (3) Prerequisite: ECON 306. Development theories, the role of agriculture in economic development, the agricultural policy environment, policies impacting rural income and equity, environmental impacts of agricultural development.

AREC 453 Natural Resources and Public Policy (3) Prerequisite: ECON 306. National use and reuse of natural resources, current environmental concerns. The allocation of natural resources among alternative uses. Optimum state of conservation, market failure, safe minimum standard, and property rights.

AREC 455 Economics of Land Use (3) Prerequisite: ECON 306. Fundamentals of site location theory. Microeconomics of land use decisions, including determination of rent and hedonic pricing models. Impacts of government decisions on land use, including regulation (e.g., zoning), transfers (transferrable development rights), provision of public services, and infrastructure. Theoretical frameworks of land use decisions, including issues relating to sprawl, agricultural land preservation, and other topics of special interest.

AREC 484 Econometric Applications in Agriculture and Environmental/Ecological Economics (3) Prerequisite: ECON 321 or equivalent. Co-requisite: ECON 306. Application of econometric techniques to problems in agriculture, environment, and natural resources. Emphasis on the assumptions and computational techniques necessary to structure, estimate, and test economic models in the fields of agricultural, environmental, and resource economics.

ARFC 489 Special Topics in Agriculture and Resource Economics (3) Repeatable to 9 credits.

ARHU — Arts and Humanities

ARHU 109 Honors Humanities Colloquium I (3) For Honors Humanities students only. Continuation of Honors Humanities Colloquium.

ARHU 118 Honors Humanities First Year Seminar I (3) One hour of lecture and two hours of discussion/recitation per week. Prerequisite: admission to Honors Humanities. Repeatable to 6 credits if content differs. Formerly ARHU 100. Interdisciplinary introduction to basic issues in the history and methodologies of the humanities.

ARHU 208 Vermeer and Dutch Genre Traditions (3) For Honors Humanities students only. Repeatable to 6 credits if content differs.

ARHU 218 Honors Humanities Second Year Seminar I (3) One hour of lecture and two hours of discussion/recitation per week. Prerequisite: admission to Honors Humanities. Repeatable to 6 credits if content differs. Seminar reflecting basic issues and basic methodologies in the humanities.

ARHU 298 Special Problems in Arts and Humanities (3) Repeatable if content differs.

ARHU 308 Critical Eras: An Interdisciplinary View (3) Prerequisite: permission of department. An interdisciplinary exploration of a critical period, ranging from a year to an era, stressing the relationship between different forms of human expression and the social milieu.

ARHU 309 Forms and Forces of Human Experience: An Interdisciplinary Exploration (3) Repeatable if content differs. An interdisciplinary analysis of a particular social or cultural topic, attitude, or concern.

ARHU 390 Cross Cultural Perspectives on Quality (3) Third course in a series of four courses in the IBM TQ program. Examines strategic quality management in a globalized setting emphasizing cross-cultural and culturally influenced perception of quality. The third of four courses in the IBM TQ curriculum.

ARHU 439 Interdisciplinary Studies in Arts and Humanities (3) Repeatable to 6 credits if content differs. An interdisciplinary study of historical, geographical or thematic topics in Arts and Humanities.

ARHU 498 Special Topics in Arts and Humanities (3) Repeatable if content differs.

ARSC — Air Science

ARSC 100 The USAF Today I (1) Freshmen course for AFROTC cadets. Study of topics relating to the Air Force and defense. Focuses on organizational structure and missions of the Air Force; officer’ship; and an introduction to both written and oral communication skills. Open to all university students. AFROTC cadets must also register for ARSC 159.

ARSC 101 The USAF Today II (1) Continuation of ARSC 100 for freshmen AFROTC cadets. The mission, organization and systems of the U.S. Air Force offensive, defensive, and support forces and the role of these forces to support contemporary societal demands. Open to all university students. AFROTC cadets must also register for ARSC 159.

ARSC 159 Air Force Officer Lab I (1) One hour of laboratory per week. Co-requisite: any other ARSC course. For AFROTC cadets only. This course does not carry credit towards any degree at the University. Repeatable to 8 credits if content differs. Offers Air Force ROTC cadet officer’s practical experience in military leadership, management, organization, and customs. May include visits to military installations and flight orientation. Open only to AFROTC cadets.

ARSC 200 The Development of Air Power I (1) Sophomore course for AFROTC cadets. Study of factors contributing to the development of air power from its earliest beginnings through two world wars; the evolution of air power concepts and doctrine; introductory leadership; and assessment of communicative skills. Open to all university students; AFROTC cadets must also register for ARSC 159.

ARSC 201 The Development of Air Power II (1) Continuation of ARSC 200 for sophomore AFROTC cadets. The study of headquarters leadership, cadre and management skills which surrounded the growth of air power; the basics of leadership; environment of an Air Force officer; and concepts of ethical behavior. Open to all university students. AFROTC cadets must also register for ARSC 159.

ARSC 205 The U.S. Air Force and Air Power (4) Open only to applicants selected by AFROTC to compete for entrance into the two-year AFROTC program as a contract cadet. Six week four day training session held during summer months at designated Air Force bases. Successful completion is a prerequisite for acceptance into the two year AFROTC program. Course content consists of a combination of academics, physical training and leadership laboratory experiences approximating those four years cadets gain in ARSC 100/101 and ARSC 200/201.

ARSC 310 Management and Leadership I (3) Junior level course for AFROTC cadets. The study of leadership and quality management fundamentals, professional knowledge, Air Force doctrine, and communicative skills. Case studies are used to examine leadership and management situations. Open to all university students. AFROTC cadets must also register for ARSC 159.

ARSC 311 Management and Leadership II (3) Continuation of ARSC 310 for junior level AFROTC cadets. Study of leadership management skills and proficiencies as well as communication skills required of Air Force officers. Open to all university students. AFROTC cadets also must register for ARSC 159.

ARSC 320 National Security Forces in Contemporary American Society I (1) Seminar course for AFROTC cadets. Study of American national security policy and processes to include information and implementation, impact of major national and international events, and development of major policy issues. Open to all university students. AFROTC cadets must also register for ARSC 159.
ARTH 310 Byzantine Art and Archaeology (3) Formerly ARTH 405. Painting, sculpture, and architecture from the early third century A.D. with emphasis on the Italian peninsula from the fourth century to the Renaissance.

ARTH 200 Art of the Western World after 1300 (3) Painting, sculpture, and architecture from the Renaissance to the present.

ARTH 250 Art and Archaeology of Ancient America (3) Art and archaeology of ancient Mesoamerica from 500 B.C. to 1500 A.D.

ARTH 275 Art and Archaeology of Africa (3) Appreciation of the art of African cultures. A survey of African culture through painting, sculpture, and architecture from prehistoric times to the present.

ARTH 289 Special Topics in Art History and Archaeology (3) Repeatable to 6 credits if content differs. Selected topics in the visual arts to introduce students to the history of various modes of visual expression and communication.

ARTH 290 Art of Asia (3) South and East Asian art from prehistory through the mid-19th century.

ARTH 300 Egyptian Art and Archaeology (3) Formerly ARTH 400. Sites and monuments of painting, sculpture, architecture, and the minor arts of ancient Egypt from earliest times through the Roman conquest. Emphasis on the pharaonic period.

ARTH 301 Aegean Art and Archaeology (3) Formerly ARTH 401. Sites and monuments of painting, sculpture, architecture, and the minor arts of Crete, the Cycladic islands, and the Greek mainland from the earliest times to the downfall of the Mycenaean era.

ARTH 302 Greek Art and Archaeology (3) Formerly ARTH 402. Sites and monuments of painting, sculpture, architecture, and the minor arts from the Geometric through the Hellenistic period with emphasis on mainland Greece in the Archaic and Classical periods.

ARTH 303 Roman Art and Archaeology (3) Formerly ARTH 403. Sites and monuments of painting, sculpture, architecture, and the minor arts from the earliest times through the third century A.D. with emphasis on the Italian peninsula from the Etruscan period through that of Imperial Rome.

ARTH 307 Late Roman and Early Christian Art and Archaeology (3) Formerly ARTH 405. Painting, sculpture, architecture, and the minor arts from the early third century through the sixth century A.D.

ARTH 310 Byzantine Art and Archaeology (3) Formerly ARTH 406. Painting, sculpture, architecture, and the minor arts from the seventh century to 1453 A.D.

ARTH 313 Early Medieval Art (3) Formerly ARTH 410. Painting, sculpture and architecture in Western Europe, ca. 500-1150.

ARTH 314 Gothic Art (3) Formerly ARTH 411. Painting, sculpture and architecture in Western Europe, ca. 1150-1400.

ARTH 320 Fourteenth and Fifteenth Century Northern European Art (3) Formerly ARTH 420. The art of northern Europe with an emphasis on painting in the Netherlands and France.


ARTH 323 Seventeenth-Century Italian Renaissance Art (3) Formerly ARTH 415. Painting, sculpture, architecture, and the decorative arts of the eighteenth century in Italy.

ARTH 324 Sixteenth-Century Italian Renaissance Art (3) Formerly ARTH 416. Painting, sculpture, architecture, and the decorative arts of the sixteenth century in Italy.

ARTH 330 Seventeenth-Century European Art (3) Formerly ARTH 430. Painting, sculpture and architecture concentrating on Italy, Spain, France, and England.

ARTH 335 Seventeenth-Century Art in the Netherlands (3) Formerly ARTH 435. Painting, sculpture and architecture in seventeenth-century Netherlands.

ARTH 343 Eighteenth-Century European Art (3) Formerly ARTH 445. From the Rococo to Neo-classicism, major developments in painting, architecture, sculpture, and the landscape garden in eighteenth-century France, England, Italy, Spain, and Germany.

ARTH 345 Nineteenth-Century European Art to 1850 (3) Formerly ARTH 445. The major trends from Neo-Classicism to Romanticism in painting, sculpture and architecture in Europe.

ARTH 346 Nineteenth-Century European Art from 1850 (3) Formerly ARTH 446. The major trends from Realism through Impressionism to Symbolism and Art Nouveau, in painting, sculpture, and architecture.

ARTH 350 Twentieth-Century Art to 1945 (3) Formerly ARTH 455. Painting, sculpture and architecture in Europe and America from the late nineteenth century to the end of World War II.

ARTH 351 Twentieth Century Art from 1945 (3) Formerly ARTH 456. Painting, sculpture and architecture in Europe and America from 1945 to the present.

ARTH 360 History of American Art to 1876 (3) Formerly ARTH 453. Painting, sculpture, architecture, and decorative arts in North America from prehistoric times to 1876.

ARTH 361 American Art Since 1876 (3) Formerly ARTH 460. Painting, sculpture, architecture, and the decorative arts in North America after 1876.

ARTH 370 Latin American Art and Archaeology before 1500 (3) Formerly ARTH 470. Pre-Hispanic painting, sculpture, architecture, with a focus on the major archaeological monuments of Mexico.

ARTH 371 Latin American Art and Archaeology after 1500 (3) Formerly ARTH 471. The effect of mingling European visual ideas with pre-Hispanic traditions. The formation of Latin American colonial art. How native American people transformed European ideas and forms.

ARTH 375 Ancient Art and Archaeology of Africa (3) Formerly ARTH 475. Art of the African continent from rock art through the nineteenth century. The cultural meaning of painting, sculpture, architecture, and artifacts from major archaeological sites.

ARTH 376 Living Art of Africa (3) Formerly ARTH 476. Art styles among the segmentary, centralized and nomadic people of Africa. The iconography and function of their art and its relationship to their various societies, cults and ceremonies.

ARTH 378 Special Topics for Honors Students (3) Prerequisites: admission to art history honors and permission of department. For ARTH majors only. Repeatable to 6 credits. Writing of a research paper. With an instructor’s permission the work may be done in conjunction with a graduate colloquium or seminar.

ARTH 379 Honors Thesis (3) Prerequisites: admission to art history honors and permission of department. For ARTH majors only. Repeatable to 6 credits. Writing of an honors thesis under the supervision of a faculty advisor.

ARTH 384 Art of Japan (3) Formerly ARTH 395. A chronological survey of Japanese painting, sculpture, architecture, and the applied arts.

ARTH 385 Art of China (3) Formerly ARTH 390. A chronological survey of Chinese painting, sculpture, and the applied arts.

ARTH 389 Special Topics in Art History and Archaeology (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Research and writing of an honors thesis under the supervision of a faculty advisor.

ARTH 451 Primitivism in Twentieth-Century Art (3) Examines the concept of primitivism as a specifically West-European cultural phenomenon.

ARTH 452 Between East and West: Modernism in East and Central Europe (3) Explores the modernist movements of Eastern and Central Europe, beginning with Russia, circa 1861.

ARTH 453 Sculpture in the Expanded Field (3) Focus on a series of problems posed by specific types of ‘sculptural’ works that link the modern with the postmodern.

ARTH 457 History of Photography (3) History of photography as an art from its inception in 1839 to the present.

ARTH 462 Twentieth-Century Black American Art (3) Formerly ARTH 474. The visual arts of Black Americans in the twentieth century, including crafts and decorative arts.

ARTH 466 Feminist Perspectives on Women in Art (3) Formerly offered as WMST 466. Credit will be granted for only one of the following: ARTH 466 or WMST 466. Principal focus on European and American women artists of the 19th and 20th centuries, in the context of the new scholarship on women.

ARTH 485 Chinese Painting (3) Formerly ARTH 490. Chinese painting history from the second century B.C. through the twentieth century, covering cultural, stylistic and theoretical aspects.

ARTH 486 Japanese Painting (3) Formerly ARTH 495. Japanese painting from the sixth through the nineteenth century, including Buddhist icon painting, narrative scrolls, and Zen-related ink painting.

ARTH 488 Colloquium in Art History (3) Prerequisite: permission of department. Repeatable to 9 credits if content differs. Colloquium to investigate a specific topic in depth.

ARTH 498 Special Topics in Art History (3) Prerequisite: permission of department. Repeatable to 9 credits if content differs.

ARTH 499 Honors Thesis (1-6) Prerequisite: permission of department. Repeatable if content differs.

ARTH 500 Advanced Studio (3) Formerly ARTH 484. An examination of the theories, methods, and practices of New and Old World archaeology.

ARTH 503 Methods of Art History and Archaeology (3) Prerequisite: permission of department. For ARTH majors only. Methods and practices of archaeological research and writing of historical/archaeological problems, familiarizing the student with bibliography and other research tools. Introduction to the historiography of art history and archaeology, surveying the principal theories, encouraging methodological debates within the discipline. Course for majors who intend to go on to graduate school.

ARTH 489 Directed Studies in Art History (1-3) Prerequisite: permission of department. Repeatable if content differs.

ARTH — Art Studio

ART 100 Two Dimensional Art Fundamentals (3) Two hours of lecture and two hours of laboratory per week. Credit will be granted for only one of the following: ART 100, ARTS 100, DESN 101, or APDS 101. Formerly ARTS 100. Principles and elements of pictorial space examined through the manipulation and organization of various materials.

ARTN 110 Elements of Drawing I (3) Six hours of laboratory per week. Formerly ARTS 110. Media and related techniques to depict stilllife, figure and nature.

ARTN 150 Introduction to Art Theory (3) Examination of art and aesthetics; review of historical and critical positions by the examination of works of art.

ART 200 Three Dimensional Art Fundamentals (3) Two hours of lecture and two hours of laboratory per week. Credit will be granted for only one of the following: ART 200, ARTS 200, DESN 102, or APDS 102. Formerly ARTS 200. Three-dimensional form and space examined through the manipulation and organization of various materials.

ART 208 Intermediate Special Topics in Art (3) Six hours of laboratory per week. Prerequisites: ART 200 and ART 200. Repeatable to 6 credits if content differs. Formerly ARTS 208. Development of student’s work on an intermediate studio level within the context of a special topic.

ART 210 Elements of Drawing II (3) Six hours of laboratory per week. Prerequisite: ART 210. Continuation of ART 210 with additional emphasis on pictorial space.
ARTT 320 Elements of Painting (3) Six hours of laboratory per week. Prerequisite: ARTT 200; and ARTT 210. Formerly ARTS 330. Basic techniques and processes related to painting. Oil and/or water-based paints.

ARTT 330 Elements of Sculpture: Metal Casting (3) Six hours of laboratory per week. Prerequisites: ARTT 200; and ARTT 210. Basic techniques related to metal casting.

ARTT 331 Elements of Sculpture: Steel (3) Six hours of laboratory per week. Prerequisites: ARTT 200; and ARTT 210. Basic techniques related to steel fabricated sculpture; torch cutting and welding, arc welding, hot forging.

ARTT 332 Elements of Sculpture: Stone (3) Six hours of laboratory per week. Prerequisites: ARTT 200; and ARTT 210. Formerly ARTS 333. Basic sculptural concepts through a variety of materials, basic techniques and processes related to building and fabrication.

ARTT 340 Elements of Printmaking: Intaglio (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 340. Basic techniques and processes related to etching, aquatint and drypoint.

ARTT 341 Elements of Printmaking: Woodcut and Relief (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 341. Basic techniques and processes related to woodcut, linocut and other relief media.

ARTT 342 Elements of Printmaking: Collagraphy (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 342. Basic techniques and processes related to collagraph printing.

ARTT 343 Elements of Printmaking: Screen Printing (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 343. Basic techniques and processes related to drawing, preparing and printing images on lithograph stones or plates.

ARTT 350 Elements of Design (3) Six hours of laboratory per week. Prerequisites: ARTT 210 and ARTT 240. Open to students who have completed ARTT 250. Credit will be given for only one of the following: ARTT 350 or ART 250. Formerly ARTS 350. Formerly ARTS 250. Basic design principles and methods. Introduction to basic typograpy, layout, illustration, exhibit design, and product/package design.

ARTT 351 Elements of Graphic Design and Illustration (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 351. Basic techniques and processes related to drawing, preparing and printing images on lithograph stones or plates.

ARTT 367 Introduction to Digital Photography (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 367. Digital photography, image and video editing, digital manipulation of photographs and other electronic imagery, digital printing, digital imaging and various aspects of photography in general. Credit will be given for only one of the following: ARTT 365, ARTT 367 or ARTT 368.

ARTT 371 Elements of Fine Art and Design Concept (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Formerly ARTS 371. Introduction to the photographic message and meaning in both the fine arts and design. Credit will be given for only one of the following: ARTT 370, ARTT 371 or ARTT 372.

ARTT 372 Presentations in Visual Processes (3) Six hours of laboratory per week. Prerequisites: ARTT 220 or ART T330 or ART T340. Formerly ARTS 404. Investigation and execution of process oriented art. Group and individual experimental projects.

ARTT 408H Honors Seminar (3) Prerequisites: Acceptance into Department Honors Program, completion of 300-400 level and 418H electives, and permission of department. Team-taught seminar focusing on relationship between students’ work and the theoretical context of contemporary art.

ARTT 418 Drawing (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Repeatable to 12 credits. Formerly ARTS 418. Original compositions from the figure and nature, supplemented by problems of personal and expressive drawing.

ARTT 428 Painting (3) Six hours of laboratory per week. Prerequisite: ARTT 210. Repeatable to 12 credits. Formerly ARTS 428. Original compositions from nature, figures, still life and expressive painting emphasizing development of personal directions.

ARTT 438 Sculpture (3) Six hours of laboratory per week. Prerequisites: one 300-level sculpture course; and permission of department. Repeatable to 12 credits. Formerly ARTS 438. Continuation of 300-level elements of sculpture courses with emphasis on developing personal directions in chosen media.

ARTT 448 Printmaking (3) Six hours of laboratory per week. Prerequisites: one 300-level printmaking course; and permission of department. Repeatable to 12 credits. Formerly ARTS 448. Continuation of 300-level elements of printmaking courses with emphasis on developing personal directions in chosen media.

ARTT 449 Advanced Photography (3) Six hours of laboratory per week. Prerequisite: ARTT 350. Repeatable to 12 credits if content differs. Advanced photographic techniques and theory. Digital photography, image and video editing, digital manipulation of photographs and other electronic imagery, instant photography, color photography and other special tools.

ARTT 458 Graphic Design and Illustration (3) Six hours of laboratory per week. Prerequisites: ARTT 350 and ARTT 351. Repeatable to 12 credits if content differs. Advanced techniques and theory of graphic design and illustration, image and text, poster, magazine, film, and television graphics, propaganda symbol included.

ARTT 459 Three Dimensional Design (3) Six hours of laboratory per week. Prerequisite: ARTT 352. Repeatable to 12 credits if content differs. Advanced techniques and theory of product design, furniture design, exhibit design and package design.

ARTT 460 Seminar in Art Theory (3) Senior standing. Exploration of relationship between content and processes of art in a contemporary multi-cultural context.

ARTT 461 Readings in Art Theory (3) Prerequisite: senior standing or permission of department. Reading and critical analysis in contemporary art.

ARTT 462 Artist’s Survival Seminar (3) Prerequisite: senior standing or permission of department. Business aspects of being an artist with emphasis on starting and maintaining a professional career.

ARTT 463 Principles and Theory: African-American Art (3) Not open to students who have completed ARTT 474. Formerly ARTT 463. Principles basic to the establishment of aesthetic theories concerning African-American art examined through the works of art by Americans of African ancestry.

ARTT 467 Seminar in the Interrelationship Between Art and Art Theory (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Formerly ARTS 467. The relationship between a student’s work and the theoretical context of contemporary art.

ARTT 478 Papermaking (3) Six hours of laboratory per week. Prerequisite: permission of department. Repeatable to 6 credits if content differs. Traditional and contemporary Western papermaking techniques with emphasis on creative approach and continued individual artistic growth.

ARTT 479 Computer Graphics (3) Six hours of laboratory per week. Prerequisite: ARTT 354. Repeatable to 12 credits if content differs. Introduction to computer imaging, graphics, illustration, and mixed media.

ARTT 480H Honors Seminar (3) Prerequisites: Acceptance into Department Honors Program, completion of 300-400 level and 418H electives, and permission of department. Team-taught seminar focusing on relationship between student’s work and the theoretical context of contemporary art.

ARTT 489 Advanced Special Topics in Art (3) Six hours of laboratory per week. Prerequisite: permission of department. Repeatable to 6 credits if content differs. Formerly ARTS 489. Development of student’s work on an advanced studio level within the context of a special topic.

ARTT 498 Theory Global Art Making (3)
ASTR 315 Navigation (3) Prerequisite: plane trigonometry. Theory and practice without calculations, with emphasis on celestial navigation and some discussion of electronic navigation. Spherical trigonometry as necessary. Extensive practical work at times to be arranged.

ASTR 320 Theoretical Astrophysics (3) Prerequisites: ASTR 121 or ASTR 240; PHYS 273 or PHYS 263; or permission of department. Application of selected physics concepts in an astrophysical context. Topics will include gravity (Keplerian motion, Schwarzschild limit), radiation, black holes, pulsars, neutron stars, accretion disks, magnetic fields, and cosmology.

ASTR 330 Solar-SYSTEM Astronomy (3) Prerequisites: ASTR 100 or ASTR 101 and completion of CORE Distribution Requirement in Mathematics and Sciences or permission of department. Designed primarily for non-physical science majors. An introductory look at the structure and evolution of the universe with emphasis on the solar system. Emphasis is on a description of recent data and interpretation.

ASTR 340 Origin of the Universe (3) Prerequisites: ASTR 100 or ASTR 101 and completion of the CORE Distribution Requirement in Mathematics and Sciences or permission of department. A study of our observation of the growth of the universe, including the study of cosmological models, including open vs. closed universe, dark matter, and other aspects of the universe.

ASTR 350 Astronomy and Astrophysics (4) Prerequisites: ASTR 200 and (PHYS 272 or PHYS 262 or PHYS 142) or permission of department. Corequisite: PHYS 273 or PHYS 263. Topics include X-ray and gamma-ray astronomy, black holes, neutron stars, cosmic rays, stellar clusters, supernovae, the Milky Way, and cosmology.

ASTR 380 Life in the Universe (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisites: ASTR 100 or ASTR 101 and completion of CORE Distribution Requirement in Mathematics and Sciences or permission of department. A study of life processes in the universe, including the conditions for the origin and existence of life in the universe.

ASTR 398 Special Topics in Astronomy (3) Prerequisite: junior standing or permission of department. Repeatable to 6 credits if content differs. This course is designed primarily for students not majoring in astronomy, and is suitable for nonscience majors. It will concentrate study in some limited field in astronomy which will vary from semester to semester. Possible subjects include: physics of stars and planetary systems, radio astronomy, cosmology, and the inconstant universe.

ASTR 399 Honors Seminar (1-16) Enrollment is limited to students admitted to the departmental honors program in astronomy. Credit accorded to work done.

ASTR 400 Stellar Astrophysics (3) Prerequisite: ASTR 350. Corequisite: PHYS 420 or PHYS 421. Radiation processes in stars and interstellar space, stellar atmospheres, stellar structure and evolution.

ASTR 410 Radio Astronomy Techniques (3) Prerequisites: (PHYS 273 and PHYS 276) or (PHYS 263 and PHYS 263A) or permission of department. Introduction to current observational techniques in radio astronomy. The radio sky, coordinate systems, radio telescopes, antenna theory, Fourier transforms, interferometry and arrays, aperture synthesis, radio detectors.

ASTR 420 Introduction to Galactic Research (3) Prerequisite: PHYS 246 or equivalent or permission of department. Methods of galactic research, stellar motions, clusters of stars, evolution of the galaxy, study of our own and neighboring galaxies.

ASTR 430 The Solar System (3) Prerequisite: MATH 246 and either PHYS 214 or equivalent or permission of department. The structure of planetary atmospheres, radiation transfer in planetary atmospheres, remote sensing of planetary surfaces, and orbits. Structure of comets. Brief discussions of asteroids, satellites, and solar system evolution. Intended for students majoring in any of the physical sciences.

ASTR 440 Introduction to Extra-Galactic Astronomy (3) Prerequisite: ASTR 350 or equivalent or permission of department. Properties of normal and peculiar galaxies, including radio galaxies and quasars; expansion of the universe and cosmology.

ASTR 450 Orbital Dynamics (3) Prerequisite: permission of department. Vectorial mechanics, motion in a central force field, gravitational and non-gravitational forces, the two-body and three-body problems, orbital elements and orbital perturbations, and the solar system. Intended for students majoring in any of the physical sciences.

ASTR 498 Special Problems in Astronomy (1-6) Prerequisite: major in physics or astronomy or permission of department. Research or special study. Credit accorded to work done.

BCHM 261 Elements of Biochemistry (3) Prerequisite: CHEM 104 or CHEM 233 or CHEM 235. Not to open to students who have completed BCHM 461. For undergraduate students who desire a one-semester biochemistry course rather than a two-semester sequence. Basic chemistry and metabolism of all molecules of biological importance.

BCHM 361 Origins of Biochemistry (3) Prerequisite: any distributional studies course in chemistry or any of the biological sciences. The development of our understanding of life processes. Emphasis on a consideration of ideas and findings that have led to diseases, hormonal mechanisms, sampling, confidence interval estimation, hypothesis testing, regression, decision theory, and the application of these concepts to problems in biology.

BCHM 461 Biochemistry II (3) Prerequisite: CHEM 243 or CHEM 247. A comprehensive introduction to general biochemistry. The chemistry and metabolism of carbohydrates, lipids, nucleic acids, and proteins.

BCHM 462 Biochemistry II (3) Prerequisite: BCHM 461. A continuation of BCHM 461.

BCHM 464 Biochemistry Laboratory (3) One hour of lecture and five hours of laboratory per week. Corequisite: BCHM 462. For BCHM and CHEM majors only.

BCHM 465 Biochemistry III (3) Prerequisite: BCHM 461. Recommended: BCHM 462. An advanced course in biochemistry.

BIOM — Biometrics

BIOM 301 Introduction to Biometrics (3) Two hours of lecture and one hour of discussion/recitation per week. Prerequisite: MATH 115. Descriptive statistics, introduction to probability and estimation, hypothesis testing, simple regression and correlation. Emphasis on simple applications of statistical techniques and interpretation of statistical results.

BIOM 401 Biostatistics I (4) Three hours of lecture and one hour of laboratory per week. Prerequisite: MATH 211 and 301. Descriptive statistics, probability models useful in biology, expectations, hypothesis testing, goodness of fit tests, central limit theorem, analysis of variance, regression, correlation, sampling, rank tests. Emphasis on the uses and the limitations of these methods in biology.

BIOM 405 Computer Applications in Biometrics (1) Two hours of laboratory per week. Corequisite: BIOM 401. An introduction to computer usage in statistical analyses. Topics include file manipulation, formatting data, transformations, descriptive statistics, graphical displays of data, and several introductory inferential statistical procedures.

BMGT — Business and Management

BMGT 210 Basic Accounting (3) Prerequisite: Restricted to students majoring in business majors only. Credit will be granted for only one of the following: BMGT 210 or BMGT 211. Basic Accounting for NON Business Majors. Required for managerial accounting. Not open to BMGT majors. Credit will not be given for both BMGT 210 and either BMGT 220 or BMGT 221.

BMGT 220 Principles of Accounting I (3) Sophomore standing. Basic theory and techniques of contemporary financial accounting. Includes the accounting cycle and the preparation of financial statements for single owner and partnership forms of business organizations operating as service companies or merchandisers.

BMGT 221 Principles of Accounting II (3) Prerequisite: BMGT 220. Basic theory and techniques of accounting for managerial decision making. Includes the introduction of the corporation and manufacturing operations. Includes cost-volume-profit analysis and capital budgeting. Introduces the topics of income taxation and international accounting.

BMGT 230 Business Statistics (3) Prerequisite: MATH 113 or MATH 115 or placement in MATH 220 or higher. Not open to students who have completed BMGT 231, ENEE 324, or STAT 400. Credit will be granted for only one of the following: AREE 484, BIOM 301, BMGT 230, CNEC 400, ECON 321, EDMS 451, GEOG 305, GQFT 422, PSYC 200, SOCY 201, URSJP 350, or TEXT 401. Introductory course in probabilistic and statistical concepts, including descriptive statistics, set-theoretical development of probability, the properties of discrete and continuous random variables, sampling, formulation of estimation, hypothesis testing, regression, decision theory and the application of these concepts to problem solving in business administration. This course meets the requirements for management science and statistics majors.

BMGT 231 Statistical Models For Business (3) Prerequisite: MATH 141 or permission of department. Required for management science and statistics and decision sciences majors. Credit will be granted for only one of the following: BMGT 231, ENEE 324, or STAT 400. An introductory course in statistical concepts, including probability and random variables, sampling, estimation and hypothesis testing, regression, decision theory and the application of these concepts to problem solving in business administration. This course meets the requirements for management science and statistics majors.

BMGT 261 Entrepreneurship: Starting and Managing the Entrepreneurial Venture (3) 3 semester hours. Sophomore standing. Not open to students who have completed BMGT 461. Credit will be granted for only one of the following: BMGT 261 or BMGT 461. Focuses on the development of a new business opportunity as a startup company. Specific areas include: identifying opportunities, conducting feasibility studies, elements of a business plan, evaluating financing alternatives, selecting a legal form of organization, and building an entrepreneurial team.

BMGT 290 Methods for Measuring Quality (3) Prerequisite: BMGT 190 or ENES 190. Also offered as ENES 380. Provides an introduction to statistical methods of measuring the need and use of measurement techniques that lead to continuous improvement. The second course of four courses in total quality.

BMGT 302 Business Computer Application Programming (3) Prerequisite: BMGT 201 or CMSC 102 or CMSC 103 or permission of department. Not open to computer science students. For BMGT majors only. Considers characteristics of business data programming and common software development processes and practices. Covers the designing, writing, documenting, and testing of an efficient, structured program in Visual Basic.

BMGT 305 Survey of Business Information Systems and Technology (3) For decision and information science majors only. Not open to computer science students. 3 semester hours. Introductory course for the decision and information sciences major. Covers the structure of business information systems, as well as the consequences of information technology on society and the environment.

BMGT 310 Intermediate Accounting I (3) Prerequisite: BMGT 221. Comprehensive analysis of financial accounting principles and their application to financial statement presentation and external reporting.

BMGT 311 Intermediate Accounting II (3) Prerequisite: BMGT 310. Continuation of BMGT 310.
BMGT 321 Cost Accounting (3) Prerequisite: BMGT 221. A study of the role of cost accounting in management decision making. Emphasis is placed on the role of the accountant in organizational management. Cost behavior, cost budgeting, responsibility accounting, and relevant costs for decision making.

BMGT 322 Income Tax Accounting (3) Prerequisite: BMGT 221. Introduction to Federal income taxation of individuals. Examination of the tax laws by use of illustrative examples and problems.

BMGT 326 Accounting Systems (3) Prerequisite: BMGT 201 and BMGT 310. A study of accounting systems and computer and communications technology. This course is restricted to accounting majors during the summer semester only. All others must have authorization.

BMGT 332 Operations Research for Management Decisions (3) Prerequisite: BMGT 230. Surveys the philosophy, techniques, and applications of operations research to managerial decision making. The course is designed primarily for students not majoring in management science or statistics. Techniques covered include linear programming, transportation and assignment, queuing, simulation, and Markov process modeling. Emphasis is placed on formulating and solving decision problems in the functional areas of management.

BMGT 340 Business Finance (3) Prerequisites: BMGT 221, BMGT 230, or BMGT 310. The principles and practices involved in managing the financial, capital, and risk functions of the business enterprises. This course addresses: (1) various sources and uses of funds; (2) the financing of growth; (3) the cost of capital, and (4) the evaluation of business enterprises; the various types of securities and their use in raising funds, accounting income, risk, and control; and financial aspects of the corporate income tax. Emphasis is placed on solution of problems of financial policy faced by management.

BMGT 343 Investments (3) Prerequisite: BMGT 340. An introduction to financial investments. Topics include security analysis, financial statements, financial markets and intermediaries, bond valuation, and portfolio analysis.

BMGT 350 Marketing Principles and Organization (3) Prerequisite: ECON 200 or ECON 205. An introduction to the concepts and principles of marketing, including the marketing of service and non-service organizations. Provides an overview of the all the concepts in marketing, including relationship marketing, product development, pricing, sales promotion, marketing research, consumer behavior, international marketing, distribution, and internal marketing to employees.

BMGT 351 Direct Marketing (3) Three hours of lecture per week. Prerequisite: BMGT 350. For BMGT majors only. Planning, organizing, communicating, and controlling strategies. Analysis of direct marketing programs in the consumer, business-to-business, and international markets. Advantages and disadvantages of direct mail, catalog, telephone, and Internet marketing will be discussed. The roles of marketing research, data base marketing, and financial management in direct marketing will be examined. Examples are drawn from the marketing of for-profit and non-profit organizations.

BMGT 352 Retail Management (3) Prerequisites: BMGT 220; and BMGT 350. Application of marketing concepts in planning and implementing retail strategy. Analysis of retail store location (store and non-store) and market trends on competitors and location of business enterprises. The consumer - the consumer market, competition, the economy and technology - affect location, merchandising, pricing, communication, service, operations and financial strategy.

BMGT 354 Project Management (3) Prerequisite: BMGT 350. Marketing communications theory with an in-depth treatment of all elements of the promotion mix, including advertising, sales promotion, direct marketing, public relations, and personal selling. Concepts applied through class exercises, team project, presentation, and discussions.

BMGT 357 Retailing and Marketing Internship (3) Prerequisite: BMGT 350 and permission of department. For BMGT majors only. Students apply work experience in retailing. Students must be engaged in marketing goods or services. Students apply concepts learned in marketing classes and analyze the firm's organizational structure, environment, and marketing strategy.

BMGT 360 Human Resource Management (3) The basic course in the study of management issues as they affect all employees. Topics include: (1) the settlement of labor disputes. An economic and legal analysis of labor union and employer association activities, arbitration, mediation, and alternative dispute resolution; (2) collective bargaining; trade agreements, strikes, boycotts, lockouts, company unions, employee representation, and injunctions.

BMGT 362 Labor Relations (3) A study of the development and management of labor relations from a strategic perspective to the settlement of labor disputes. An economic and legal analysis of labor union and employer association activities, arbitration, mediation, and alternative dispute resolution; (2) collective bargaining; trade agreements, strikes, boycotts, lockouts, company unions, employee representation, and injunctions.

BMGT 364 Management and Organization Theory (3) Prerequisite: BMGT 221 or permission of department. An introduction to the basic concepts, theories, and terms of management systems. Relational databases, query languages and design will be covered. File-processing techniques are examined.

BMGT 365 Financing The Entrepreneurial Venture (3) Prerequisite: BMGT 261 or 461. Junior standing. Teaches the financial tools to build an analytical framework for determining financial strategies for the early stages of growth from start-ups through the harvest stage. Topics include: cash management, "bootstrapping", private placement, bank financing, valuation concepts, venture capital, "angel" financing, and initial public offerings.

BMGT 366 Growth Strategies for Emerging Companies (3) Prerequisite: BMGT 261 or BMGT 461. 3 semester hours. Junior standing. Focuses on how successful startup companies transition from the early stage of growth to a position of maintaining high rates of growth. There is a particular emphasis on how high technology businesses make this transition by changing their strategic focus and management style.

BMGT 367 Career Search Strategies in Business (1) One hour of lecture and one hour of laboratory per week. Junior standing. For BMGT majors only. Essential aspects of achieving an effective career move in the job market. Strategies for exploring career options, conducting a job search, and career management. Development of specific skills for effective career search and management.

BMGT 370 Introduction to Transportation Management (3) Prerequisite: ECON 200; or BMGT 205. An overview of the transportation sector, including providers, users and government agencies. Examines contemporary public policy issues, such as deregulation, along with managerial strategies in transportation.

BMGT 372 Introduction to Logistics Management (3) The study of logistic functions of business involved in the movement and storage of supplies, work-in-progress and finished goods. The trade-offs between cost and service and the purchase and supply of raw materials; the warehousing and control of inventories; industrial packaging; materials handling within warehouses; and the distribution of finished goods to customers required to minimize costs, maximize profits or increase customer service levels.

BMGT 373 Logistics and Transportation Internship (3) Prerequisites: BMGT 270 or BMGT 372. (One of these courses may be taken as a corequisite). Students are expected to work experience in transportation. Students will be expected to relate course material to work experience in an analysis of a firm's operations.


BMGT 381 Business Law II (3) Prerequisite: BMGT 380 or permission of department. Commercial Code, including sales, commercial paper, secured transactions, bulk sales and documents of title. The law of partnerships and corporate law, including mergers and liquidation under the bankruptcy laws. The law of real property, landlord and tenant relationships and desisten's estates.

BMGT 384 Production Management (3) Studies the operation of a manufacturing enterprise, concentrating on the economies of production. Introduces analytical method so that the broad problem areas of system design, operation and control can be based upon the analytical method.

BMGT 390 Competing on Quality in a Global Economy (3) Prerequisite: either BMGT 221 or ECON 205. Examines strategic quality management in a global setting. Global marketing, international finance, and cross cultural aspects of quality management will be emphasized. The third course of four courses in total quality.

BMGT 392 Introduction to International Business Management (3) Prerequisite: ECON 200; or BMGT 205. A study of the domestic and foreign environmental factors affecting the international business. The course also covers the administrative aspects of international marketing, finance and management.

BMGT 393 Real Estate Principles (3) Prerequisite: ECON 200; or ECON 205. The nature and uses of real estate, real estate as a business enterprise, family and partnership ownership, real estate as a business enterprise, family and partnership ownership, and real estate.

BMGT 398 Individual Study in Business and Management (1-3) Prerequisite: permission of department. Repeatable to 6 credits.

BMGT 402 Database Systems (3) Prerequisite: BMGT 350 or equivalent. Techniques and principles for the design, development and implementation of database management systems. Relational databases, query languages and design will be covered. File-processing techniques are examined.

BMGT 403 Systems Analysis and Design (3) Prerequisite: BMGT 350 or equivalent. Techniques and principles for the design, development and implementation of information systems. System life cycle, requirements analysis, logical and physical database design, and computer implementation. Emphasis on case studies. Project required that involves the design, analysis and implementation of an information system.

BMGT 405 Business Telecommunications (3) Prerequisite: BMGT 350 or equivalent. Concepts of business data communications and data processing and the role of these ideas in computer networks, including basic principles of telecommunications technology, computer network technology, data management in distributed database systems and management of the technical and functional components of telecommunications technology.

BMGT 406 Electronic Commerce Application Development (3) Prerequisite: BMGT 350. For BMGT majors only. Develops understanding of the fundamental principles of e-commerce as they apply to electronic commerce applications. Aspects of web site evaluation are examined. Course will also cover the design of computer accessible web sites using current tools and techniques.

BMGT 407 Info Systems Projects (3) Prerequisite: 12 hours of information systems. For decision and information sciences majors only. Senior standing. Senior capstone course for the decision and information sciences majors. Collected knowledge from courses and application to problems of size and complexity. State-of-the-art research ideas and current business and industrial practices in information systems.

BMGT 410 Fund Accounting (3) Prerequisite: BMGT 310. An introduction to the fund-based theory and practice of accounting as applied to governmental entities and not-for-profit associations.

BMGT 411 Ethics and Professionalism in Accounting (3) Prerequisite: BMGT 311. For accounting majors only. Senior standing. Analysis and discussion of issues related to ethics and professionalism in accounting.

BMGT 417 Advanced Tax Accounting (3) Prerequisites: BMGT 311; and BMGT 323. Federal taxation of corporations, partnerships, fiduciaries, and gratuitous transfers. Tools and techniques of tax research for compliance and planning.

BMGT 420 Undergraduate Accounting Seminar (1-3) Prerequisite: permission of department. Repeatable to 3 credits. Senior standing. Seminar for upperclassmen as an introduction to the current issues in accounting, current problems and case studies in accounting.

BMGT 422 Auditing Theory and Practice (3) Prerequisite: BMGT 311. A study of the independent accountant's attest function generally accepted auditing standards, compliance and substantive tests, and report forms and opinions.

BMGT 424 Advanced Accounting (3) Prerequisite: BMGT 311. Advanced accounting theory applied to specialized topics and current problems. Emphasis on consolidated statements and partnership accounting.

BMGT 426 Advanced Cost Accounting (3) Prerequisite: BMGT 321. Advanced cost accounting with emphasis on managerial aspects of internal recordkeeping and control systems.

BMGT 427 Advanced Auditing Theory and Practice (3) Prerequisite: BMGT 422. An examination and indepth study of special auditing topics such as statistical sampling, tests of details, and SEC auditing.

BMGT 430 Linear Statistical Models in Business (3) Prerequisite: BMGT 230 or BMGT 231 or permission of department. Model building involving an intensive study of the general linear stochastic model and the application of this model to business problems. The model is derived in matrix form and this form is used to analyze both the regression and correlation aspects of the model. Techniques include least squares estimation, and single and multiple variable minimization.

BMGT 435 Introduction to Applied Probability Models (3) Prerequisite: BMGT 231 or permission of department. Statistical models in management. Review of probability theory, Monte Carlo methods, discrete event simulation, Markov
chains, queuing analysis, other topics depending upon time. "Guess, and you will find a new language, new ideas, and the class and the students will carry out various exercises using this language."

BMGT 440 Financial Management (3) Prerequisite: BMGT 340. Analysis and discussion of cases and readings relating to financial management. The application of relevant concepts to the solution of financial problems is emphasized.

BMGT 443 Security Analysis and Valuation (3) Prerequisite: BMGT 343. Study and application of the concepts, methods, models, and empirical findings to the analysis, valuation, and selection of specifically constructed portfolios.

BMGT 444 Futures Contracts and Options (3) Prerequisite: BMGT 343. The instruments and economic rationale, underlying markets in futures and options, hedging, speculation, structure of futures prices, interest rate futures, efficiency in futures markets, and stock and commodity options.

BMGT 445 Commercial Bank Management (3) Prerequisites: BMGT 340; and ECON 430. Analysis and discussion of cases and readings in commercial bank management. The loan function is emphasized; also the management of liquidity reserves, investments for income, and source of funds. Bank objectives, functions, policies, organization, structure, services, and regulation are considered.

BMGT 446 International Finance (3) Prerequisite: BMGT 340. Financial management from the perspective of the multinational corporation. Topics covered include the organization of foreign operations, foreign exchange controls, international capital markets, international capital budgeting, financing foreign trade and designing a global financing strategy. The course is on how to assess and exchange political risks while maximizing benefits from global opportunity sets faced by the firm.

BMGT 447 Internship and Research in Finance (3) Prerequisites: BMGT 334 or 343 (or 400 level finance elective); and consent of the business and management department. Recommended: finance major or finance minors. Internship involves working in business and management for a period of at least 200 hours. Interns will be given the opportunity to practice the skills learned in the classroom in a business setting.

BMGT 451 Consumer Analysis (3) Prerequisite: BMGT 330. Recommended: PSYC 100; and PSYC 221. Not open to students who have completed CNEC 437. Credit will be granted for only one of the following: BMGT 451 or CNEC 437. Identifying buyer behavior concepts relevant to a specific marketing problem so that appropriate marketing decisions can be made. Conceptual frameworks are drawn from psychology, sociology, economics, and other social sciences to aid in understanding the behavior of ultimate and industrial buyers.

BMGT 452 Marketing Research Methods (3) Prerequisites: BMGT 370 and BMGT 372. Analysis of the operational aspects of logistics management, including purchasing policies, transportation planning, and inventory control. Attention is directed toward total logistics cost minimization and the development of sustainable competitive advantage based on logistical activities.

BMGT 453 International Marketing (3) Prerequisites: BMGT 350 plus one other marketing course. Marketing functions from the international executive's viewpoint, including coverage of logistics, marketing, and regulation are considered.

BMGT 455 Advertising (3) Prerequisite: BMGT 350. Develops skills in constructing effective advertising. Examines how to formulate an advertising message, which creative tactics to use in the media, and how the media uses advertising to ensure that the target receives the message. In addition, the role of advertising agencies, measuring advertising effectiveness, and regulatory and ethical issues in advertising will be discussed.

BMGT 457 Marketing Policies and Strategies (3) Prerequisite: BMGT 451. Corequisite: BMGT 452. This capstone course ties together concepts from all the various courses in the marketing management program. Marketing strategy planning is the framework. Application of these principles is accomplished by analyzing and discussing cases and by playing a marketing strategy simulation game. Analysis of current business articles to understand the link between theory and real-world problem solving.

BMGT 460 Human Resource Management: Analysis and Problems (3) Prerequisite: BMGT 360. Recommended: BMGT 366. Senior standing. Course focuses on the discussion and development of personnel policies which are implemented in human resource management. Topics include: recruitment, selection, training, appraisal, compensation, benefits, and change management.

BMGT 462 Employment Law for Business (3) Restricted to BMGT majors with 72 hours completed. Legal framework of industrial relations with special emphasis on employment discrimination, i.e., wrongful termination, sex discrimination, sexual harassment, age discrimination, disability, etc.

BMGT 464 Organizational Behavior (3) Prerequisite: BMGT 364. An in-depth study of organizational behavior, emphasizing theories concerning the forces which contribute to the behavior of organizational members. Topics covered include work group behavior, leadership behavior, communication, conflict, and attitudes, organizational development, organizational change, and organizational goals and design.

BMGT 465 Business Plan For The New Venture (3) Prerequisites: BMGT 365 and BMGT 366. 3 semester hours. Course explores the development of business plans written by teams of 3-5 students. Topics include: use of the business plan, business plans for BMGT 205. Focus is on the complex interrelationships, sources, and assessment of the venture, securing capital, financial planning, and legal issues.

BMGT 467 Undergraduate Seminar in Human Resource Management (3) Prerequisite: permission of department. Senior standing. Course focuses on the discussion and development of personnel policies which are implemented in human resource management. Topics include: recruitment, selection, training, appraisal, compensation, benefits, and change management.

BMGT 470 Advanced Transportation Management (3) Prerequisites: BMGT 370; and BMGT 372. The study of the wide range of issues facing managers in each of the transportation modes. This includes decisions on market entry, pricing, competitive responses, service levels, marketing strategies, capital structure, and growth objectives. Specific management decisions and overall strategies pursued by management in each of the modes are compared and contrasted. The decisions of transportation firms concerning the forces which contribute to the behavior of organizational members. Topics covered include work group behavior, leadership behavior, communication, conflict, and attitudes, organizational development, organizational change, and organizational goals and design.

BMGT 472 Advanced Logistics Operations (3) Prerequisite: BMGT 372. Analysis of the operational aspects of logistics management, including purchasing policies, transportation planning, and inventory control. Attention is directed toward total logistics cost minimization and the establishment of sustainable competitive advantage based on logistical activities.

BMGT 473 Advanced Transportation Policies (3) Prerequisite: BMGT 370. An analysis of the impact of government policies on carrier management in the various transportation modes. Specific attention is given to carrier policies, safety regulations, and the role of the government in the development of transportation policy. The effects of regulatory policies on carrier management in the various transportation modes are also considered.

BMGT 474 Urban Transportation Systems (3) Prerequisite: BMGT 370 and BMGT 372. An introduction to the expanding base of transportation systems, including buses, rail systems, alternative fuels, and public transit. The role of transportation in urban development, including case studies of successful and unsuccessful case studies of urban transportation systems, is considered. The development of public transportation systems, including the role of public policy, is examined. The role of transportation in urban development, including case studies of successful and unsuccessful case studies of urban transportation systems, is considered. The development of public transportation systems, including the role of public policy, is examined.
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BMGT 495 Business Policies (3) Prerequisites: BMGT 340; and BMGT 310. Field study of major business policies. Repeatable to 6 credits if content differs. Special topics in business and management designed to meet the changing needs and interests of students and faculty.

BMGT 496 Business Ethics and Society (3) Prerequisite: one course in BMGT; or permission of department. A study of the standards of business conduct, morals, values, and the role of business in society, with consideration of the sometimes conflicting interests of and claims on the firm and its objectives. Emphasizes a strategic approach by business to the management of its external environment.

BMGT 498 Special Topics in Business and Management (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Special topics in business and management designed to meet the changing needs and interests of students and faculty.

BSCI — Biological Sciences Program

The following courses may involve the use of animals. Students who are concerned about the use of animals in teaching have the right to enroll and to refrain from enrollment, to determine whether animals are to be used in the course, whether class exercises involving animals are optional or required and what alternatives, if any, are available.

BSCI 103 The World of Biology (4) Three hours of lecture and three hours of laboratory per week. Formerly ENTM 100. A survey of the major groups of insects, their natural history, and their relationships with humans and their environment. Course not acceptable toward major requirements in the College of Life Sciences.

BSCI 105 Principles of Biology I (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: placement in MATH 110 or higher. For science majors. Credit will be granted for only one of the following: BSCI 110/BIL 101 or BSCI 105/BIL 105. Formerly BIL 105. Basic principles of biology with special emphasis on cellular and molecular biology.

BSCI 106 Principles of Biology II (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: BSCI 105. Basic principles of biology with special emphasis on organismic, ecological and evolutionary biology.

BSCI 120 Insects (3) Two hours of lecture and one hour of discussion/recitation per week. Formerly ENTM 100. A year of college general education for the non-science student. Emphasis will be placed on the beekeeping department. Repeatable to 6 credits if content differs. Special topics in beekeeping department designed to meet the changing needs and interests of students and faculty.

BSCI 212 Principles of Genetics (4) Three hours of lecture and two hours of discussion/recitation per week. Prerequisites: BSCI 106 or consent of the instructor. Credit will be granted for only one of the following: BSCI 222/BIOL 222 or MCB 222. Formerly BIOL 222. Principles and mechanisms of heredity and gene expression. Includes plant, animal, and microbial organisms.

BSCI 223 General Microbiology (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: BSCI 105. Credit will be granted for only one of the following: BSCI 122 or BSCI 223. Formerly MCB 222. Fundamental concepts in morphology, physiology, genetics, immunology, ecology, and pathogenic microbiology. Applications of microbiology to medicine, the food industry and biotechnology.

BSCI 224 Animal Diversity (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: BSCI 222. Formerly ZOOL 201. Comparative study of the diversity of animal and plant forms and functions, including analysis of structures and mechanisms which allow organisms to cope with similar requirements of life.

BSCI 225 Introductory Plant Biology (4) Prerequisite: BSCI 105 or HORT 100 or permission of department. Formerly PBIO 122. An introductory course in the biology of flowering plants. Emphasis is placed on the evolutionary and ecological approach to studying fundamental concepts and processes of plants, their place in the biosphere, the importance of plants to man, and the manner in which humans impact on plants and their environment. This course will not count toward graduation requirements for any student in the College of Life Sciences or the College of Agriculture and Natural Resources.

BSCI 226 Plant Taxonomy (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: BSCI 105 or permission of department. Formerly PBIO 250. An introductory study of plant identification, naming and classification. Laboratory emphasis on the collection and identification of local vascular plants.

BSCI 227 Principles of Entomology (4) Three hours of lecture and two hours of laboratory per week. Formerly ENTM 205. An introductory survey of the classification of insects. Basic physiological, ecological and behavioral processes that result in the dominance of insects in the animal kingdom. The management of pest insect populations and the consequences of the strategies used to regulate pest insects. A collection is required.

BSCI 230 Cell Biology and Physiology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: BSCI 106 and CHIS 121. Biochemical and physiological mechanisms underlying cellular function. Properties of cells which make life possible and mechanisms by which cells of the body communicate and regulate and integrate with each other and their environment.

BSCI 258 College Park Scholars Internship (1-3) For College Park Scholars - Life Sciences students only. Repeatable to 6 credits if content differs. Formerly BIOL 258. Credit to be determined by CPS Director. Must be completed by end of sophomore year. Course not acceptable toward major requirements in the College of Life Sciences.

BSCI 279 Supplemental Study (1-3) Prerequisite: permission of department. Repeatable to 6 credits. Formerly ZOOL 299. Research or special study to complement a course taken or a year's work. Credit not acceptable toward major requirements. Course not acceptable toward major requirements in the College of Life Sciences.

BSCI 288 Off-Campus Internship (1-3) Prerequisite: permission of department. Repeatable to 12 credits if content differs. Formerly BIOL 288. An individual experience arranged by the student and the instructor. Does not satisfy biology major requirements. Course not acceptable toward major requirements in the College of Life Sciences.

BSCI 301 Biological Issues and Scientific Evidence (3) Prerequisite: BSCI 105. Formerly ZOOL 301. Scientific inquiry in biology, exemplified by topics such as Mendelian and molecular genetics. Implications of genetic research for society. The use of DNA fingerprinting in court; scientific vs. alternative medicine; evolution vs. creationism. Not for biology majors, it will acquaint students with the Bay's watershed, its marine environments and humanity's potential uses and misuses of these resources. Credit will be granted for only one of the following: BSCI 322, ZOOL 322, or BSCI 312. Formerly ZOOL 322. Experiments using lower and higher animals will be done by the students. Prerequisite: One science course. Credit will be granted for only one of the following: BIOL 322, ZOOL 322, or BSCI 312. Formerly ZOOL 322. Experiments using lower and higher animals will be done by the students. Prerequisite: One science course. Credit will be granted for only one of the following: BIOL 322, ZOOL 322, or BSCI 312. Formerly ZOOL 322. Experiments using lower and higher animals will be done by the students. Prerequisite: One science course.

BSCI 322 Principles of Genetics (4) Three hours of lecture and two hours of discussion/recitation per week. Prerequisites: BSCI 106, one college year, credit. Credit will be granted for only one of the following: BSCI 222/BIOL 222 or MCB 222. Principles and mechanisms of heredity and gene expression. Includes plant, animal, and microbial organisms.

BSCI 323 General Microbiology (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: BSCI 105. Credit will be granted for only one of the following: BSCI 122 or BSCI 223. Formerly MCB 222. Fundamental concepts in morphology, physiology, genetics, immunology, ecology, and pathogenic microbiology. Applications of microbiology to medicine, the food industry and biotechnology.

BSCI 324 Animal Diversity (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: BSCI 106. Credit will be granted for only one of the following: BSCI 122 or BSCI 223. Formerly MCB 222. Fundamental concepts in morphology, physiology, genetics, immunology, ecology, and pathogenic microbiology. Applications of microbiology to medicine, the food industry and biotechnology.

BSCI 325 Introductory Plant Biology (4) Prerequisite: BSCI 105 or HORT 100 or permission of department. Formerly PBIO 122. An introductory course in the biology of flowering plants. Emphasis is placed on the evolutionary and ecological approach to studying fundamental concepts and processes of plants, their place in the biosphere, the importance of plants to man, and the manner in which humans impact on plants and their environment. This course will not count toward graduation requirements for any student in the College of Life Sciences or the College of Agriculture and Natural Resources.

BSCI 326 Plant Taxonomy (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: BSCI 105 or permission of department. Formerly PBIO 250. An introductory study of plant identification, naming and classification. Laboratory emphasis on the collection and identification of local vascular plants.

BSCI 327 Principles of Entomology (4) Three hours of lecture and two hours of laboratory per week. Formerly ENTM 205. An introductory survey of the classification of insects. Basic physiological, ecological and behavioral processes that result in the dominance of insects in the animal kingdom. The management of pest insect populations and the consequences of the strategies used to regulate pest insects. A collection is required.

BSCI 338 Special Topics in Cell Biology and Molecular Genetics (1-4) Formerly MCB 388. Presentation and discussion of current research in all areas of cell biology and molecular genetics. A maximum of three credit hours of BSCI 338 may be applied to major.

BSCI 340 Principles of Animal Behavior (3) Two hours of lecture and one hour of discussion/recitation per week. Prerequisites: BSCI 105 and BSCI 106 and BSCI 222. Formerly ZOOL 340. The study of animal behavior in the context of evolution, ecology, and natural selection.

BSCI 341 Introductory Plant Pathology (3) Prerequisite: BSCI 105 or equivalent. Field study of the major diseases of major crop plants and the interaction between the causal agents, nature and management of plant diseases.

BSCI 342 Biology of Reproduction (3) Prerequisite: BSCI 105 or permission of department. Also offered as WMST 326. Credit will be granted for only one of the following: BSCI 342 or WMST 326. Formerly ZOOL 326. The biology of the reproductive system with emphasis on mammals and, in particular, on human reproduction. Hormone actions, sperm production and function, ovulation, menstruation, sexual behavior, contraception, pregnancy, lactation, maternal behavior, and menopause.

BSCI 343 Special Topics in Cell Biology and Molecular Genetics (1-4) Formerly MCB 388. Presentation and discussion of current research in all areas of cell biology and molecular genetics. A maximum of three credit hours of BSCI 343 may be applied to major.

BSCI 346 Principles of Animal Behavior (3) Two hours of lecture and one hour of discussion/recitation per week. Prerequisites: BSCI 105 and BSCI 106 and BSCI 222. Formerly ZOOL 346. The study of animal behavior in the context of evolution, ecology, and natural selection.

BMGT 495 Business Policies (3) Prerequisites: BMGT 340; and BMGT 310. Field study of major business policies. Repeatable to 6 credits if content differs. Special topics in business and management designed to meet the changing needs and interests of students and faculty.
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BSCI 436 Drug Action and Design (3) Prerequisite: CHEM 243 or permission of instructor. 60 semester hours. junior standing. Formerly MICH 443. Introductory pharmacology with an emphasis on "magic bullets", novel therapies, and drug design.

BSCI 437 General Virology (3) Prerequisite: BSCI 222 and completion of one additional laboratory class in BSCI, including BSCI 444, Prerequisite: BSCI 420. A study of the physical and chemical nature of viruses, virus cultivation and assay methods, virus replication with emphasis on oncoviral oncogenic viruses, viral genetics, and characteristics of the major virus groups.

BSCI 440 Mammalian Physiology (4) Three hours of lecture and two hours of discussion/recitation per week. Prerequisites: BSCI 220 and CHEM 233 and PHYS 122. Formerly ZOOL 420. Study of the cardiovascular, hemopoietic, gastrointestinal, renal and respiratory systems. Chemical and physical regulation of physiological functions in mammals. Course does not count as an upper level lab for BIOL majors (see BSCI 441).

BSCI 441 Mammalian Physiology Laboratory (2) Four hours of laboratory per week. Co-requisite: BSCI 440. Formerly ZOOL 423. Laboratory exercises in experimental mammalian physiology.

BSCI 442 Plant Physiology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: BSCI 105/BIOL 105 and CHEM 103. Formerly PBIO 420. A survey of the general principles using non-phototropic methods from the view of ecological habitat management.


BSCI 444 Neurophysiology Lectures (3) Prerequisites: BSCI 230 and CHEM 233 and PHYS 122. Credit will be granted for only one of the following: BSCI 444 or BSCI 445. Formerly ZOOL 420. The physiology of nerves, muscles, and sensory receptors and aspects of central nervous system physiology.

BSCI 445 Neurophysiology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: BSCI 230 and CHEM 233 and PHYS 122. Credit will be granted for only one of the following: BSCI 444 or BSCI 445. Formerly ZOOL 420. The physiology of nerves, muscles and sensory receptors and aspects of central nervous system physiology.

BSCI 446 Neural Systems (3) Prerequisite: BSCI 230. Formerly MICH 410. Neurological development, followed by motor and integrative system organization in the central nervous system.

BSCI 447 General Endocrinology (3) Prerequisites: BSCI 230 and CHEM 233 and MATH 220. Formerly ZOOL 416. Functions and the functioning of the endocrine glands of animals with special reference to the vertebrates.

BSCI 450 History of Microbiology (1) Prerequisite: MICB major. Formerly MICH 410. History and integration of the fundamental discoveries of the science. Modern aspects of albinogenesis, fermentation, and disease causation in relation to early theories.

BSCI 451 Physical Chemistry for Biologists (3) Prerequisite: BSCI 230 or equivalent. Formerly ZOOL 3285. Mechanistic and quantitative aspects of chemical and physical processes, including diffusion, ligand-receptor binding, DNA melting, sedimentation, redox reactions, kinetics, fluorescence, osmotic, and electrophoretic measurements.

BSCI 460 Plant Ecology (Prerequisite: BSCI 106. Formerly PBIO 460. The dynamics of populations as affected by environmental factors with special emphasis on the structure and composition of natural plant communities, both terrestrial and aquatic.

BSCI 461 Plant Ecology Laboratory (2) Three hours of laboratory per week. Pre- or corequisite: BSCI 460. Formerly PBIO 461. Two or three field trips per semester. The application of field and experimental methods to the qualitative and quantitative aspects of plant vegetation and ecosystems.


BSCI 463 Laboratory and Field Ecology (2) Four hours of laboratory and field work per week. Prereq or co-requisite: BSCI 462 and a course in statistics. Formerly ZOOL 471. Laboratory and field exercises involving problems of contemporary ecological interest; population density regulation, community structure, and spatial pattern diversity in both terrestrial and aquatic systems.

BSCI 464 Microbial Ecology (3) Prerequisites: BSCI 223 and CHEM 243 or CHEM 245. Formerly MICH 480. Interaction of microorganisms with the environment, other microorganisms and communities. Emphasis on one of biology, including BSCI 444. Formerly ZOOL 481. A study of the taxonomy and functional morphology of the invertebrates, exclusive of insects. Emphasis on the study of life history of microorganisms.

BSCI 484 The Biology of Marine and Estuarine Invertebrates (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: BSCI 222 and CHEM 233 and PSYH 122. Formerly ZOOL 484. A study of the morphology, taxonomy and functional morphology of marine invertebrates. Emphasis on the study of life history of marine invertebrates.

BSCI 485 Protozoology (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: one of the following: BSCI 444 or BSCI 445. Formerly ZOOL 485. The study of protozoa, living and stained, collected from diverse habitats.

BSCI 486 Systematic Microbiology (2) Prerequisite: eight credits in microbiology. Formerly MICH 400. History and philosophy of classification. Alpha numerical and molecular genetic taxonomy. Methods used in microbial identification and classification.

BSCI 487 Managing Pests without Pesticides (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: BSCI 227 or permission of department. Formerly EMTN 454. Systematic assessment of the principles of plant protection and pest population management. Emphasis on deriving strategies using non-pesticidal methods from the view of ecological habitat management.

BSCI 488 Summer Biology Institutes (1-4) Prerequisite: permission of department. Formerly BIOL 488, BIOL 489, and BIOL 490. Repeatable to 12 credits if content differs.

BSCI 490 Plant Structure (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: BSCI 105. Formerly PBIO 480. An introductory course in the biology, morphology and taxonomy of the fungi.

BSCI 493 Medical and Poisonous Plants (3) Two hours of lecture and two hours of discussion/recitation per week. Prerequisites: BSCI 105 and CHEM 233 or 4. Formerly ZOOL 485. A study of plants important to humans that have medicinal or poisonous properties. Emphasis on plant source, plant description, the active agent and its beneficial or detrimental physiological action and effects.

BSCI 494 Animal-Plant Interactions (3) Prerequisites: BSCI 106 and BSCI 227, or BSCI 224, or permission of department. Formerly EMTN 485. A survey of the basic structural features of vascular plants, including sub-cellular organelles, cells, tissues, and organs. Emphasis on structural phenomena as they relate to physiological processes of agricultural importance.

BSCI 495 Advanced Plant Taxonomy (3) Two hours of lecture and one hour of laboratory per week. Prerequisites: BSCI 225 and BSCI 226. Formerly PBIO 450. A review of the history and principles of plant taxonomy with emphasis on monographic and floristic research. A detailed laboratory review of the families of flowering plants.

BSCI 492 Mycology (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: BSCI 105. Formerly PBIO 460. An introductory course in the biology, morphology and taxonomy of the fungi.

BSCI 493 Medicinal and Poisonous Plants (3) Two hours of lecture and two hours of discussion/recitation per week. Prerequisites: BSCI 105 and CHEM 233 or 4. Formerly ZOOL 485. A study of plants important to humans that have medicinal or poisonous properties. Emphasis on plant source, plant description, the active agent and its beneficial or detrimental physiological action and effects.

BSCI 494 Animal-Plant Interactions (3) Prerequisites: BSCI 106 and BSCI 227, or BSCI 224, or permission of department. Formerly EMTN 485. A survey of the basic structural features of vascular plants, including sub-cellular organelles, cells, tissues, and organs. Emphasis on structural phenomena as they relate to physiological processes of agricultural importance.

BSCI 496 Systematic Microbiology (2) Prerequisite: eight credits in microbiology. Formerly MICH 400. History and philosophy of classification. Alpha numerical and molecular genetic taxonomy. Methods used in microbial identification and classification.

BSCI 497 Insect Pests of Ornamentals and Turf (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: BSCI 227 or permission of department. Formerly EMTN 472. A study of the morphology, biology and control of the pest organisms and their ecological interactions with man and animals. The ecology and behavior of vectors in relation to disease transmission will be emphasized.

BSCI 498 The Biology of Marine and Estuarine Invertebrates (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: BSCI 222 and CHEM 233 and PSYH 122. Formerly ZOOL 484. A study of the morphology, taxonomy and functional morphology of the invertebrates, exclusive of insects. Emphasis on the study of life history of marine invertebrates.

BSCI 499 Managing Pests without Pesticides (4) Three hours of lecture and six hours of laboratory per week. Prerequisites: BSCI 227 or permission of department. Formerly EMTN 472. Basic concept treatment of free-living and parasitic protozoan functional morphology, life history, and systematics. The laboratory will stress observation of protozoa, living and stained, collected from diverse habitats.

BSCI 496 Systematic Microbiology (2) Prerequisite: eight credits in microbiology. Formerly MICH 400. History and philosophy of classification. Alpha numerical and molecular genetic taxonomy. Methods used in microbial identification and classification.

BSCI 497 Insect Pests of Ornamentals and Turf (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: BSCI 227 or permission of department. Formerly EMTN 472. A study of the morphology, biology and control of the pest organisms and their ecological interactions with man and animals. The ecology and behavior of vectors in relation to disease transmission will be emphasized.
BSOS 188 Selected Topics in the Behavioral and Social Sciences (1-3) Repeatable to 6 credits if content differs. Not open to students who have completed EDCP 108P. Credit will be granted for only one of the following: EDCP 108P or BSOS 188A. Introductory selected topics course dealing with interdisciplinary issues related to the social sciences.

BSOS 191 Introduction to Civics (3) 3 semester hours. An introduction to the social and historical foundations of a civil society. Examination of the roles of individuals, groups, social institutions and community services.

BSOS 288 Special Topics in Behavioral and Social Sciences (1-3) Repeatable to 6 credits if content differs. Introductory special topics course dealing with interdisciplinary topics related to behavioral and social sciences.

BSOS 308 Contemporary Issues: Interdisciplinary Approaches (3) Repeatable to 6 credits if content differs. An interdisciplinary analysis of current public policy issues of national, international and community import. Senior standing recommended.

BSOS 338 Academic Seminar for Interns: Federal and International (1-3) Two hours of lecture per week. Prerequisite: permission of department. Co-requisite: BSOS 339. Repeatable to 6 credits if content differs. This is the academic seminar for student interns in BSOS 339. Students read, discuss, analyze, and write about topics in political and public policy leadership, and leadership studies.

BSOS 339 Internship in Political Institutions: Federal and International (3-6) 8 hours per week in internship site for 15 weeks for 3 credits or 16 hours per week in internship site for 15 weeks for 6 credits. Prerequisite: permission of department. Corequisite: BSOS 338. Repeatable to 6 credits if content differs. This is the academic seminar for student interns in BSOS 339. Students read, discuss, analyze, and write about topics in political and public policy leadership, and leadership studies.

BSOS 349 Internship in Political Institutions: State and Local (3-6) 8 hours per week in internship site for 15 weeks for 3 credits or 16 hours per week in internship site for 15 weeks for 6 credits. Prerequisite: permission of department. Corequisite: BSOS 348. Repeatable to 6 credits if content differs. This is the academic seminar for student interns in BSOS 349. Students read, discuss, analyze, and write about topics in political and public policy leadership, and leadership studies.

BSOS 359 Internship for Community Service Organizations (3-6) Prerequisite: permission of department. This course offers students supervised placements in non-profit community organizations. Attendance at the seminar and discussion section is required.

BSOS 388 Behavioral and Social Sciences Special Topics (1-3) Repeatable to 6 credits if content differs. Advanced special topics course focusing on an interdisciplinary topic related to the Behavioral and Social Sciences.

BSOS 396 Fellowship Program in Political Leadership (2-6) Prerequisite: permission of department and acceptance of full-time fellowship program. Corequisite: BSOS 346, BSOS 356 or BSOS 366. Individual instruction course.

BSOS 399 Directed Study in Behavioral and Social Sciences (1-6) Prerequisite: permission of department. This course offers the advanced student capable of interdisciplinary study on special projects under the supervision of the Assistant Dean for Student Affairs.

CCJS — Criminology and Criminal Justice

CCJS 105 Introduction to Criminology (3) Criminology and the theoretical approach to the development of law enforcement. The principles of organization and administration for law enforcement; functions and specific activities; planning and research; public relations; personnel and training; inspection and control; direction; policy formulation.

CCJS 110 Introduction to Criminal Justice (3) Introduction to the administration of criminal justice in a democratic society. An introduction to the theoretical approach to the development of law enforcement. The origins of organization and administration of the criminal justice system in relationship to the role of the victim and the services offered to the victim.

CCJS 360 Victimology (3) Prerequisite: CCJS 105. Overview of the history and theory of victimology. Analysis of victimization patterns with special emphasis on types of victims and crimes. The interaction between victims of crime and the criminal justice system in relationship to the role of the victim and the services offered to the victim.

CCJS 370 Race, Crime and Criminal Justice (3) Prerequisite: CCJS 100 or equivalent. Race and role of treatment of racial/ethnic minorities in the criminal justice system. Course will provide students with historical and theoretical framework for understanding this dynamic.

CCJS 388 Independent Reading Course in Criminology and Criminal Justice (3) Prerequisites: CCJS 100 and CCJS 105. For honors students only. Designed for the needs of honor students in criminology and criminal justice.

CCJS 399 Independent Research in Criminal and Criminal Justice (3) Prerequisites: CCJS 100 or equivalent. For honors students only. Designed for the needs of honor students in criminology and criminal justice.

CCJS 399 Law Enforcement Field Training (1-6) Prerequisite: 6 credits of CCJS; and permission of department. Repeatable to 6 credits. Supervised, structured and focused field training in law enforcement agencies.

CCJS 399 Independent Study in Criminology and Criminal Justice (1-3) Prerequisites: 12 credits in criminology and criminal justice; permission of department. Credit will be granted for only one of the following: BSOS 339, BSOS 349, BSOS 359 or BSOS 336. Students supervised. Internship placements in federal and international political or public policy organizations.

CCJS 348 Academic Seminar for Interns: State and Local (3-6) Two hours of lecture per week. Prerequisite: permission of department. Co-requisite: BSOS 349. Repeatable to 6 credits if content differs. This is the academic seminar for student interns in BSOS 349. Students read, discuss, analyze, and write about topics in political and public policy leadership, and leadership studies.

CCJS 330 Criminal and Criminal Justice Research Methods (3) Prerequisites: CCJS 100 and CCJS 105; and one of the following: CCJS 200 or SOCY 201 or PSYC 200 or ECON 212 or BMGT 230. Introduction to the formulation of research questions covering crime and justice, research designs, data collection, analysis, evaluation and reporting in criminological and justice-system settings.

CCJS 330 Contemporary Criminological Issues (3) Prerequisites: CCJS 100; and permission of department. An introduction to the prediction, ecological studies of crime, family and delinquency and similar criminal problems. An examination of research procedures for civil law and the use of statistics. Admissibility of evidence. Representation. Indigent's right to counsel.


CCJS 330 Concepts of Law Enforcement Administration (3) Prerequisite: CCJS 100 or equivalent. An introduction to concepts of organization and management as these relate to the administration and organization of manpower, material, and systems for the effective development of innovative ideas using a research and development approach to change. Development approach to change strategies and tactics which are appropriate for criminal justice personnel in entry-level positions.

CCJS 345 Contemporary Criminological Theory (3) Prerequisites: CCJS 105; and CCJS 300; and CCJS 350. Brief historical overview of criminological theory up to the 50's. Detailed analysis of the key trends in criminological thought. Emphasis on change strategies and tactics which are appropriate for criminal justice personnel in entry-level positions.

CCJS 346 Modern Criminology (3) Prerequisites: CCJS 105; and CCJS 300; and CCJS 350. A review of the law of criminal corrections from sentencing to final release or parole. Probation, punishments, special treatments for defendants, parole and pardon, and the prisoner's civil rights are also examined.

CCJS 349 Advancing Law Enforcement Administration (3) Prerequisites: CCJS 340 or permission of department; and CCJS 300. The structuring of manpower, material, and systems to accomplish the major goals of social control. Personnel and systems management. Political controls and limitations on authority and jurisdiction.

CCJS 451 Crime and Delinquency Prevention (3) Prerequisites: CCJS 105 or CCJS 234; and CCJS 300; and CCJS 350. A review of the law of criminal corrections from sentencing to final release or parole. Probation, punishes, special treatments for defendants. parole and pardon, and the prisoner's civil rights are also examined.

CCJS 422 Treatment of Criminals and Delinquents (3) Prerequisites: CCJS 105 or CCJS 350 or permission of department; and CCJS 300. Methods and programs used to modify criminal and delinquent behavior.

CCJS 453 White Collar and Organized Crime (3) Prerequisites: CCJS 105 or CCJS 350; and CCJS 300. Defining, detection, prosecution, sentencing and impact of white collar and organized crime. Special consideration given to the role of federal law and enforcement practices.

CCJS 454 Contemporary Criminological Theory (3) Prerequisites: CCJS 105; and CCJS 300; and CCJS 350. Brief historical overview of criminological theory up to the 50's. Detailed analysis of the key trends in criminological thought. Emphasis on change strategies and tactics which are appropriate for criminal justice personnel in entry-level positions.
CHEM 103 General Chemistry I (4) Three hours of lecture, three hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: placement in MATH 110 or higher. Credit will be granted for only one of the following: CHEM 113, CHEM 153, or CHEM 143. The first semester of a course sequence for chemistry majors and biochemistry majors. Kinetics, reaction mechanisms. Lab topics will focus on inorganic chemistry and quantitative analysis for chemistry and biochemistry majors.

CHEM 102, CHEM 143. The first semester of a chemistry sequence for chemistry majors. Stoichiometry, molecular structure and the equilibrium of acids, bases and buffers. Lab topics will focus on inorganic chemistry and quantitative analysis.

CHEM 153 General and Inorganic Chemistry (3) Three hours of lecture, six hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: CHEM 143. For CHEM and BCHM majors only. Not open to students who have completed CHEM 201, CHEM 203, or CHEM 244. Credit will be granted for only one of the following: CHEM 102, CHEM 122, CHEM 113, or CHEM 153. The second semester of a course sequence for chemistry and biochemistry majors. Kinetics, ionic equilibria, redox reactions, electrochemistry, descriptive inorganic chemistry.

CHEM 227 Inorganic and Analytical Chemistry Lab (3) One hour of lecture and six hours of laboratory per week. Prerequisite: CHEM 113, CHEM 133, or CHEM 143. Laboratory work as required for CHEM 113 and CHEM 133 in inorganic chemistry and quantitative analysis for chemistry and biochemistry majors.

CHEM 233 Organic Chemistry I (4) Three hours of lecture, three hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: CHEM 113 or CHEM 153 or permission of department. For CHEM, BCHM, and ENCH majors and honors students only. Credit will be granted for only one of the following: CHEM 233, CHEM 235, CHEM 237. The chemistry of carbon: aliphatic compounds, aromatic compounds, stereochemistry, alkenes, arenes, halides, alcohols, esters, and spectroscopy.

CHEM 237 Principles of Organic Chemistry I (4) Three hours of lecture and four hours of laboratory per week. Prerequisite: CHEM 113 or CHEM 135 or permission of department. For CHEM, BCHM, and ENCH majors and honors students only. Credit will be granted for only one of the following: CHEM 233, CHEM 235 or CHEM 237. The chemistry of carbons: aliphatic compounds, aromatic compounds, stereochemistry, alkenes, arenes, halides, alcohols, esters, and spectroscopy.

CHEM 243 Organic Chemistry II (4) Three hours of lecture, three hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: CHEM 233 with a grade of C or better. Credit will be granted for only one of the following: CHEM 233, CHEM 247. A continuation of CHEM 233 with emphasis on molecular structure, substituent reactions; carbonium ions; aromaticity, aromatic hydrocarbons, sterols, macro-molecules.

CHEM 247 Principles of Organic Chemistry II (4) Three hours of lecture and four hours of laboratory per week. Prerequisite: CHEM 233 or permission of department. For CHEM, BCHM, and ENCH majors and honors students only. Credit will be granted for only one of the following: CHEM 233 or CHEM 247. A continuation of CHEM 233 with emphasis on molecular structure, substituent reactions; carbonium ions; aromaticity, aromatic hydrocarbons, sterols, macro-molecules.

CHEM 287 Computer Programming for the Biological and Chemical Sciences (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: one year of college chemistry and prior exposure to a structured programming language (PASCAL, FORTRAN or C). Credit will be granted for only one of the following: CHEM 425, CHEM 481 or CHEM 482. A continuation of CHEM 287. Advanced quantitative techniques necessary in physical chemical measurements. Experiments will be coordinated with topics in CHEM 481.

CHEM 425 Instrumental Methods of Analysis (4) Three hours of lecture, three hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: CHEM 243 or CHEM 247. Corequisite: CHEM 481. An introduction to the principles and applications of quantitative chemical analysis. Emphasis on spectroscopy for structure determination.

CHEM 481 Physical Chemistry I (3) Prerequisite: CHEM 113 or CHEM 153 or MATH 141, and PHYS 121 or equivalent. A course primarily for chemists and chemical engineers. CHEM 482 Physical Chemistry II (3) Prerequisite: CHEM 481. A course primarily for chemists and chemical engineers. CHEM 483 Physical Chemistry Laboratory I (2) One hour lecture-recitation and one three-hour laboratory period per week. Corequisite: CHEM 481. An introduction to the principles and applications of quantitative chemical analysis. Emphasis on spectroscopy for structure determination.

CHEM 491 Advanced Organic Chemistry Laboratory (4) One hour of lecture and 10 hours of laboratory per week. Prerequisite: CHEM 243, Formerly CHEM 433 and CHEM 443. Credit will be granted for only one of the following: CHEM 433, CHEM 443 or CHEM 492. Advanced techniques in organic chemistry with an emphasis on spectroscopy for structure determination.

CHEM 492 Advanced Inorganic Chemistry Laboratory (3) One hour of lecture and eight hours of laboratory per week. Corequisite: CHEM 481. A three-credit (chemical) laboratory course. Emphasis on spectroscopy methods for structure determination. Students complete an individual special project.

Designed to satisfy the university requirement for a capstone course in chemistry.)

CHEM 498 Special Topics in Chemistry (3) Three lectures or two lectures and one three-hour laboratory per week. Prerequisite: varies with the nature of the topic being considered. Course may be repeated for credit if the subject matter is substantially different, but not more than three credits may be accepted in satisfaction of major requirements for chemistry majors.

CHIN — Chinese

CHIN 101 Intensive Elementary Chinese I (6) Non-majors admitted only after a placement interview. Introduction to speaking, reading, and writing Chinese with an emphasis on mastering the essentials of pronunciation, basic characters, and structural patterns.

CHIN 102 Elementary Spoken Chinese (3) Prerequisite: CHIN 101 or equivalent. Non-majors admitted only after a placement interview. Continuation of CHIN 101 with a greater emphasis on speaking, vocabulary and grammar development with particular emphasis on conversation. May be taken in conjunction with CHIN 103.

CHIN 103 Elementary Written Chinese (3) Prerequisite: CHIN 101 or equivalent. Non-majors admitted only after a placement interview. Continuation of CHIN 101 with a greater emphasis on grammar and vocabulary build up with particular emphasis on reading and writing. May be taken in conjunction with CHIN 102.
CHIN 105 Elementary Chinese - Accelerated Track (3) Prerequisite: Department. Not open to students who have completed CHIN 101, CHIN 102, or CHIN 103. Accelerated instruction in Mandarin Chinese at the elementary level for students with prior Chinese language background, either through home use or formal instruction.

CHIN 201 Intermediate Spoken Chinese I (3) Prerequisite: CHIN 202 or equivalent. Non-majors admitted only after a placement interview. Emphasis on development of conversational skills with vocabulary buildup and controlled conversation.

CHIN 202 Intermediate Written Chinese I (3) Prerequisite: CHIN 203 or equivalent. Non-majors admitted only after a placement interview. Reading and writing skills with emphasis on grammar and Chinese characters.

CHIN 203 Intermediate Spoken Chinese II (3) Prerequisite: CHIN 201 or equivalent. Non-majors admitted only after a placement interview. Continuation of CHIN 201.

CHIN 204 Intermediate Written Chinese II (3) Prerequisite: CHIN 202 or equivalent. Non-majors admitted only after a placement interview. Continuation of CHIN 202.

CHIN 205 Intermediate Chinese - Accelerated Track (3) Prerequisite: permission of department. Not open to students who have completed CHIN 201, CHIN 202, CHIN 203, or CHIN 204. Accelerated instruction in Mandarin Chinese at the intermediate level for students with prior Chinese language background, either through home use or formal instruction.

CHIN 213 Chinese Poetry into English: An Introduction (3) Prerequisite: CHIN 301 Intermediate Spoken Chinese I (3) or permission of department. Non-majors admitted only after a placement interview. Conversation, reading, and writing applicable to grammar and Chinese characters.

CHIN 301 Advanced Chinese I (3) Prerequisite: CHIN 202 or equivalent. Non-majors admitted only after a placement interview. Reading, expository and fictional writing with emphasis on composition and translation.

CHIN 302 Advanced Chinese II (3) Prerequisite: CHIN 301 or equivalent. Non-majors admitted only after a placement interview. Continuation of CHIN 301.

CHIN 305 Life in China through TV Plays I (3) Prerequisite: CHIN 203, CHIN 204 or permission of department. Using authentic Chinese language material in short TV plays to learn about society and life in China.

CHIN 306 Life in China through TV Plays II (3) Prerequisite: CHIN 305 or permission of department. Continuation of CHIN 305 using authentic Chinese language material in TV plays to learn about society and life in China.

CHIN 313 Chinese Poetry and Prose in Translation (3) Prerequisite: CHIN 203, CHIN 204 or permission of department. Using authentic Chinese language material in literature by famous writers and with emphasis on translation.

CHIN 314 Chinese Fiction and Drama in Translation (3) Prerequisite: CHIN 202 or equivalent. Non-majors admitted only after a placement interview. Reading, expository and fictional writing with emphasis on translation.

CHIN 315 Classical Chinese I (3) Prerequisite: CHIN 302. Introduction to classical Chinese using literary and historical sources in the original language.

CHIN 316 Classical Chinese II (3) Prerequisite: CHIN 302. Further study of classical Chinese poems and prose with emphasis on the culture movement.

CHIN 401 Business Chinese I (3) Prerequisite: CHIN 402 or permission of department. Non-majors admitted only after a placement interview. Emphasis on department. Non-majors admitted only after a placement interview. Emphasis on department. Non-majors admitted only after a placement interview. Emphasis on department.

CHIN 412 Business Chinese II (3) Prerequisite: CHIN 411 or permission of department. Non-majors admitted only after a placement interview. Emphasis on department. Non-majors admitted only after a placement interview. Emphasis on department.

CHIN 413 Advanced Conversation and Composition (3) Prerequisite: CHIN 402 or permission of department. Non-majors admitted only after a placement interview. Writing and speaking skills with emphasis on grammar and Chinese characters.

CHIN 415 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 403 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 416 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 403 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 417 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 403 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 418 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 403 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 419 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 403 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 421 Sounds and Transcriptions of Mandarin Chinese (3) Prerequisite: CHIN 203 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 423 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 403 or equivalent. Non-majors admitted only after a placement interview. Reading of periodical literature on selected topics with emphasis on translation and practice of Chinese/English translation and interpretation.

CHIN 424 Advanced Chinese Grammar (3) Prerequisite: CHIN 301 Intermediate Spoken Chinese I (3) or permission of department. Using authentic Chinese language material in literature by famous writers and with emphasis on current pedagogical as well as linguistic theories.

CHIN 431 Translation and Interpretation I (3) Prerequisite: CHIN 302 or equivalent. Permission of department. Theory and practice of Chinese/English translation and interpretation.

CHIN 432 Translations of Mandarin Chinese (3) Prerequisite: CHIN 302 or equivalent. Permission of department. Workshop on Chinese/English translation and interpretation, with emphasis on writing essays, letters, and reports on selected topics. Conversation directed toward everyday situations and topics related to life in China.

CHIN 441 Traditional Chinese Fiction (3) Prerequisite: permission of department. Major works of fiction from the 4th century tales of the marvelous through the 19th century Chinese novel. Taught in Chinese.

CHIN 442 Modern Chinese Fiction (3) Prerequisite: permission of department. Major works of fiction from the 19th century to the present in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work. No knowledge of Chinese required.

CHIN 443 Classical Chinese Calligraphy (3) Prerequisite: permission of department. Major works of fiction from the 19th century to the present in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work. No knowledge of Chinese required.

CHIN 444 Roman Literature in Translation (3) Prerequisite: permission of department. Major works of fiction from the 19th century to the present in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work. No knowledge of Chinese required.

CHIN 445 Reading and Research in Chinese Literature (3) Prerequisite: permission of department. Major works of fiction from the 19th century to the present in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work. No knowledge of Chinese required.

CHIN 446 Ancient Chinese Poetry and Prose in Translation (3) Prerequisite: permission of department. Major works of fiction from the 19th century to the present in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work. No knowledge of Chinese required.

CHIN 447 Ancient Chinese Poetry and Prose in Translation (3) Prerequisite: permission of department. Major works of fiction from the 19th century to the present in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work. No knowledge of Chinese required.

CHIN 448 Directed Study in Chinese (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Readings in Chinese under faculty supervision.

CHIN 449 Directed Study in Chinese (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Readings in Chinese under faculty supervision.

CHIN 450 Directed Study in Chinese (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Readings in Chinese under faculty supervision.

CHIN 451 Directed Study in Chinese (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Readings in Chinese under faculty supervision.

CHIN 452 Directed Study in Chinese (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Readings in Chinese under faculty supervision.

CHIN 453 Directed Study in Chinese (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Readings in Chinese under faculty supervision.
shell programming; text editing; filters; pipes; macro processing; data analysis; text processing; document maintenance.

CMSC 113 Computer Science II (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: CMSC 150 and CMSC 112, each with a grade of C or better or permission of department based on satisfactory performance on the department's placement exam. Credit will be granted for only one of the following: CMSC 113 or CMSC 120. A continuation of CMSC 112. Intended for computer science majors.

CMSC 114 Computer Science I (4) Three hours of lecture and two hours of laboratory per week. Prerequisite: CMSC 106 with a grade of C or better; or permission of department based on satisfactory performance on the department's placement exam. Credit will be granted for only one of the following: CMSC 114 or CMSC 113. With CMSC 214, this course is open only to computer science majors. Introduction to UNIX. Procedural and data abstraction using C++. CMPS and Computer Engineering students will be given priority for registration until the first day of classes.

CMSC 150 Introduction to Discrete Structures (4) Three hours of lecture and two hours of discussion/recitation per week. Pre- or co-requisite: MATH 140. Formerly CMSC 250. Fundamental mathematical concepts related to computer science, including finite and infinite sets, relations, functions, and propositional logic. Introduction to other techniques, modeling and solving problems in computer science. Introduction to permutations, combinations, graphs, and trees with selected applications.

CMSC 214 Computer Science II (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: CMSC 114 and CMSC 113. With CMSC 214, this course is open only to computer science majors. One of the following: CMSC 214 or CMSC 113. Elementary data structures, recursion, and object-oriented programming using C++.

CMSC 250 Discrete Structures (3) Prerequisite: MATH 141. Formerly CMSC 150. Fundamental mathematical concepts related to computer science, including finite and infinite sets, relations, functions, and propositional logic. Introduction to other techniques, modeling and solving problems in computer science. Introduction to permutations, combinations, graphs, and trees with selected applications.

CMSC 251 Algorithms (3) Prerequisites: CMSC 214 with a grade of C or better and CMSC 250 with a grade of C or better. A systematic study of the complexity of some elementary algorithms related to sorting, graphs, and trees, and combinations and permutations. Algorithms are analyzed using mathematical techniques to solve recurrences and summations.

CMSC 297 Honors Seminar (1) An introduction to the breadth of computer science research. Intended for all Computer Science Honors students, especially those considering a career in research. Corequisite: CMSC 251. Not applicable to the major requirements in computer science.

CMSC 306 C++ and Elementary Data Structures (4) Three hours of lecture and two hours of laboratory per week. Prerequisite: CMSC 106. Credit will be granted for only one of the following: CMSC 113 or CMSC 306. An introduction to object-oriented programming using C++. Recursion, pointers, elementary data structures including linked lists and trees. Data abstraction, inheritance. Not applicable to the major requirements in computer science.

CMSC 307 Internet and Other Networks (3) Prerequisite: CMSC 107. An introduction to types of networks for computers and to the utilities available on the Internet. Not applicable to major requirements in computer science.

CMSC 311 Computer Organization (3) Prerequisite: permission of department. Introduction to assembly language. Design of digital logic circuits. Organization of central processing units, including instruction sets, register transfer operations, control micro-programming, data representation, and arithmetic algorithms. Memory and input/output organization. Design and analysis of programs in C. An introduction to computer programming, using structured programming concepts.

CMSC 320 Organization of Programming Languages (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: CMSC 214 with a grade of C or better. The organization of programming languages and run-time organization. Several different models of languages are discussed, including procedural (e.g., C, Pascal), functional (e.g., ML, Lisp), rule-based (e.g., C++, Smalltalk), run-time structures, including dynamic versus static scope rules, storage for strings, arrays, records, and object inheritance are explored.

CMSC 390 Honors Paper (3) Prerequisite: admission to CMCS Honors Program. Special study or research directed toward preparation of honors paper.

CMSC 400 Introduction to Computer Systems and Software (3) Prerequisite: MATH 141 and experience with a high-level programming language and (graduate standing or permission of department) or the AB C++ AP exam; or permission of department; or CMSC graduate student. Input/output processors and techniques. Intra-system and inter-system communication. Addressing and memory hierarchies. Microprogramming, parallelism, and pipelining.

CMSC 412 Operating Systems (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: A grade of C or better in CMSC 311 or ENEE 350), and a grade of C or better in CMSC 412. Computer systems, and third-generation multiprogramming systems. Organization and operation of the parts of an operating system in terms of function, structure, and implementation. Basic resource allocation policies.

CMSC 415 Computer and Network Security (3) Prerequisites: CMSC 214 and permission of department; or CMSC graduate student. An introduction to the hardware and software context of computer systems and networks. Identify, analyze, and solve network-related security problems in computer systems. Emphasis on network security issues and applications of cryptography technologies, as well as the practical problems that have to be solved in order to make those technologies workable in the real world. Not applicable to the major requirements in computer science.

CMSC 420 Data Structures (3) Prerequisites: a grade of C or better in CMSC 310 and a grade of C or better in CMSC 420. Computer networks and architectures. The OSI model including discussion and examples of various network layers. An introduction to the Internet. Security of networks. Communication protocols specification, analysis, and testing.

CMSC 421 Introduction to Artificial Intelligence (3) Prerequisites: (a) a grade of C or better in CMSC 251 and a grade of C or better in CMSC 310; (b) a grade of C or better in CMSC 421. Areas and issues in artificial intelligence, including search, inference, knowledge representation, learning, vision, natural languages, expert systems, robotics. Implementation and application of programming languages (e.g., LISP, PROLOG, Smalltalk) in programming artificial intelligence (e.g., expert systems, constraint satisfaction, rule-based and production systems, knowledge representation). Evaluation of AI software tools. Psycholinguistic theories of natural language processing.
CMSC 426 Image Processing (3) Prerequisite: CMSC 420 and permission of department; or CMSC graduate student. An introduction to basic techniques of analysis and manipulation of pictorial data by computer. Image input/output devices, image preprocessing, filtering, edge and corner detection, and image representation and storage. Special emphasis on computer graphics and its applications.

CMSC 427 Computer Graphics (3) Prerequisites: MATH 240; and a grade of C or better in CMSC 426. An introduction to the principles of computer graphics. Includes an introduction to two- and three-dimensional graphics, line and surface segments, color, methods for modeling illumination, shading, and reflection.

CMSC 430 Theory of Language Translation (3) Prerequisites: a grade of C or better in CMSC 330; and permission of department; or CMSC graduate student. Formal grammars and automata, and the use of such devices in the design of compilers, systems for language translation, and artificial intelligence. This course is cross-listed with MATH 430. Credit will be granted for only one of the following: CMSC/MATH 430 or CMSC/MATH 450.

CMSC 433 Programming Language Technologies and Paradigms (3) Prerequisite: CMSC 330. Programming languages (e.g. object-oriented programming) and their implementations and use in software design and implementation.

CMSC 434 Human Factors in Computer and Information Systems (3) Prerequisites: CMSC 330 with a grade of C or better and CMSC 426. An introduction to human factors in computer and information systems. Issues include: perception, motor control, cognitive processes, interfaces, psychology, social psychology, and ethical issues. This course is cross-listed with PSYC 434. Credit will be granted for only one of the following: CMSC/MATH 434 or CMSC/MATH 454.

CMSC 440 Logic for Computer Science (3) Prerequisite: CMSC 214 or CMSC 251 with a grade of C or better and CMSC department. Study of propositional logic and first-order logic. Includes the concepts of truth, interpretation, validity, provability, and semantic consequence. Also offered as MATH 440. Credit will be granted for only one of the following: CMSC/MATH 440 or CMSC/MATH 450. Introduction to linear programming, interior point methods, and the design of interactive systems. Science base (theories, methods, models, usability studies, and controlled experimentation), and software engineering with user interface development environments. Issues include: graphics and programming languages; memory, forms, and direct manipulation; graphical user interfaces, computer-supported cooperative work, information search and visualization, input/output devices, and display design.

CMSC 450 Logic for Computer Science (3) Prerequisites: CMSC 420 with a grade of C or better and permission of department; or CMSC graduate student. An introduction to the principles of computer science. Topics include formal logic, propositional and first-order logic, and their applications to the design of computer systems.

CMSC 451 Design and Analysis of Computer Algorithms (3) Prerequisites: a grade of C or better in CMSC 251; and permission of department. Fundamental techniques for designing efficient computer algorithms, proving their correctness, and analyzing their complexity. General topics include sorting, selection, graph algorithms, and basic algorithm design paradigms (such as divide-and-conquer, dynamic programming, and greedy algorithms), lower bounds and NP-completeness.

CMSC 452 Elementary Theory of Computation (3) Prerequisites: CMSC 214 with a grade of C or better and CMSC 251 with a grade of C or better. Alternative theoretical models of computation, types of automata, and their relations to formal grammars and languages.

CMSC 456 Cryptology (3) Prerequisite: Two 400-level MATH courses with a grade of C or better and CMSC 427 with a grade of C or better. An introduction to the theory and practice of cryptography. The cryptography course focuses on the mathematics and computer science. Mathematical topics include number theory and algebra, and computer science topics include complexity theory.

CMSC 460 Computational Methods (3) Prerequisites: MATH 240 and MATH 241 or CMSC/MATH 456. Basic computational methods for interpolation, least squares, approximation, numerical quadrature, numerical solution of polynomial and differential equations, and the convergence of numerical and initial value problems for ordinary differential equations. Emphasis on methods and their computational properties rather than their analytic aspects. Required primarily for students in the physical and engineering sciences.

CMSC 466 Introduction to Numerical Analysis I (3) Prerequisites: MATH 240 and MATH 241 and CMSC 105 or CMSC 106 or CMSC 114 or ENEE 114 or permission of instructor. Also offered as MATH 466. Credit will be granted for only one of the following: CMSC/MATH 466 or CMSC/MATH 456. Floating point computations, direct methods for linear systems, identification of sources of linear problems.

CMSC 467 Introduction to Numerical Analysis II (3) Prerequisite: CMSC/MATH 466 with a grade of C or better; and permission of department; or CMSC graduate student. Also offered as MATH 467. Credit will be granted for only one of the following: CMSC 467 or MATH 467. Advanced interpolation, linear least squares, eigenvalue problems, ordinary differential equations, fast Fourier transforms.

CMSC 475 Combinatorics and Graph Theory (3) Prerequisites: MATH 240 and MATH 241; and permission of department; or CMSC graduate student. General topics include enumeration methods, difference equations, generating functions. Elements of graph theory, matrix representations of graphs, approximation algorithms, network flows, combinatorial optimization, and matching theory and graph algorithms.

CMSC 477 Optimization (3) Prerequisites: CMSC/MATH 460, or CMSC/MATH 466, or CMSC/MATH 456 with a grade of C or better and permission of department; or CMSC graduate student. Also offered as MATH 477. Credit will be granted for only one of the following: CMSC 477 or MATH 477. Linear programming including the simplex algorithm and dual linear programs; convex functions and elements of convex geometry; combinatorial optimization, integer programming.

CMSC 498 Special Problems in Computer Science (1-3) Prerequisites: permission of department. An individualized course designed to allow a student or students to pursue a specialized topic or project under the supervision of the instructor.

CM — Communication

COMM 100 Foundations of Oral Communication (3) Not open to students who have completed COMM 107 or SPCH 107. Credit will be granted for only one of the following: COMM 100 or SPCH 107. A study of the nature and practice of oral communication, including the fundamentals of presenting ideas, messages, and arguments. Emphasis on methods and their computational properties rather than their analytic aspects. Intended primarily for students in the physical and engineering sciences.


COMM 230 Argumentation and Debate (3) Formerly SPCH 230. An introduction to argumentation and debate. Emphasis on methods and their computational properties rather than their analytic aspects. Introduction to standard academic debate.

COMM 250 Introduction to Communication Inquiry (3) Formerly COMM 350 or JOUR 350. An introduction to the study of communication. Definitions, models, and contexts of communication; rhetorical theory and rhetorical criticism of discourse.

COMM 324 Communication and Gender (3) Formerly SPCH 324. An introduction to the study of communication between male and female, and male-male and female-female communication, the differences in male and female communication behaviors and their implications of those images and styles for male-female transactions.


COMM 340 Communicating the Narrative (3) Formerly SPCH 340. The role of narratives in communication and development of strategies to effectively communicate the narrative form through storytelling, oral reading, and anecdotes.

COMM 350 Public Relations Theory (3) Prerequisite: Grade C or better in JOUR 201 or COMM 250; or permission of department. Not open to students who have completed JOUR 330. Credit will be granted for only one of the following: COMM 350 or COMM 420 or JOUR 330 or JOUR 530. Formerly JOUR 330. The historical development and contemporary status of public relations in business, government, associations and other organizations. Application of practical communication strategies to the research, planning, evaluation and communication aspects of the public relations process.

COMM 351 Public Relations Techniques (3) Prerequisite: Grade C or better in JOUR 201 or COMM 250. Not open to students who have completed JOUR 331. Credit will be granted for only one of the following: COMM 351 or JOUR 331. Formerly JOUR 331. The techniques of public relations, including news releases, publications and printed materials, audio-visual techniques, speeches and special events. Application of these techniques in laboratory and field projects.

COMM 352 Specialized Writing in Public Relations (3) Prerequisite: COMM 351. Not open to students who have completed JOUR 332. Credit will be granted for only one of the following: COMM 352 or JOUR 332. Formerly JOUR 332. Public relations writing for science and health, business, corporate finance, educational policy, law and government in broadcast and technical media, as well as newspapers, magazines, proposals, speeches and correspondence.

COMM 354 Public Relations Programs (3) Prerequisite: COMM 350. Not open to students who have completed JOUR 334. Credit will be granted for only one of the following: COMM 354 or JOUR 334. Formerly COMM 334. Analysis of eight major public relations professionals: employee relations, media relations, financial relations, member relations, governmental relations, community relations, fundraising and dealing with activist public.

COMM 360 The Rhetoric of Black America (3) Formerly SPCH 360. An introduction to the rhetorical tradition of Black Americans from the colonial period to the present.


COMM 383 Urban Communication (3) Formerly SPCH 383. A study of urban communication and its impact on the social and cultural landscape of Black Americans from the colonial period to the present.

COMM 398 Communication Practicum (1-3) A supervised practicum experience in communication.

COMM 399 Selected Topics in Communication (3) Repeatable to 6 credits if content differs. Formerly SPCH 399. Special topics of current interest in the field of communication.

COMM 399 Honors Thesis (3) Nine hours of laboratory per week. Prerequisite: permission of department. For COMM majors only. Repeatable to 6 credits if content differs. Formerly SPCH 399.

COMM 400 Research Methods in Communication (3) Prerequisite: COMM 250 and an introductory course in statistics. Formerly SPCH 400. Philosophy of scientific method; research design and decision-making; research methods and evaluation techniques (measurement, sampling, design, analysis).

COMM 401 Interpreting Strategic Discourse (3) Formerly SPCH 401. Principles and approaches for practical analysis of discourse designed to shape audience opinion.
DANC 248 Modern Dance I (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: DANC 148 or dance major standing. Repeatable to 6 credits. Body alignment, rhythm, dynamics, space and dance phases.

DANC 249 Modern Dance II (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: DANC 248 or department. Repeatable to 6 credits. Continuation of DANC 248.

DANC 258 Jazz I (2) One hour of lecture and two hours of laboratory per week. Prerequisite: DANC 150 or dance major standing. Repeatable to 4 credits. Jazz warm-ups and combinations emphasizing rhythm and movement isolation.

DANC 259 Jazz II (2) One hour of lecture and two hours of laboratory per week. Prerequisite: DANC 258. Repeatable to 4 credits. Continuation of Jazz I. Emphasis on style and execution of movement.

DANC 299 Practicum in Choreography, Production and Performance I (1-3) Prerequisite: DANC 199 or permission of department. Repeatable to 6 credits. Continuation of DANC 199.

DANC 302 Music Sources for Dance (3) Prerequisite: DANC 102 or permission of department. Study of musical literature, improvisation and composition as they relate to dance. Techniques of instrumental accompaniment.

DANC 305 Principles of Teaching Dance (3) Prerequisites: DANC 100 and MATH 110 or placement in MATH 115 or above. An examination of the various aspects of performing arts teaching. Laboratory in dance instruction including methods, lesson plans and practice teaching.

DANC 306 Creative Dance for Children (3) Prerequisite: DANC 305 or equivalent. Communication of the essential elements of dance to children. The development of movement into simple forms to serve as a symbol of creative individual expression.

DANC 308 Choreography II (3) Prerequisite: DANC 208. Repeatable to 6 credits. Exploration of the formal elements of choreography: theme, development, repetition, contrast, transition, continuity and structure.

DANC 309 Improvisation II (2) Prerequisite: DANC 109 or aud. Repeatable to 4 credits. Continuation of DANC 109.

DANC 310 Dance Lighting (3) Prerequisite: DANC 210. Two lectures and two laboratory periods per week. Theory and practice of stage lighting with specific reference to designing for dance.

DANC 328 Ballet III (2) Prerequisite: DANC 229 or audition. Repeatable to 4 credits. Execution of the vocabulary of ballet movement with technical accuracy.

DANC 329 Ballet IV (2) Prerequisite: DANC 328 or audition. Repeatable to 4 credits. Continuation of DANC 328.

DANC 348 Modern Dance III (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: DANC 249 or audition. Repeatable to 6 credits. The body as an instrument of dance.

DANC 349 Modern Dance IV (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: DANC 348 or audition. Repeatable to 6 credits. Continuation of DANC 348.

DANC 365 Labanotation (3) Prerequisites: DANC 102 and DANC 248. Formerly DANC 266. Introduction to Rudolf Laban’s system of structural movement analysis.

DANC 367 Dance in World Cultures (3) An examination of non-Western dance forms, including classical, ceremonial, and folk-traditional in their historical and societal contexts.

DANC 370 Kinesiology for Dancers (4) A study of the biological and physical principles of movement and the effects of dancing upon the structure and function of human body.

DANC 379 Practicum in Dance (1-3) Repeatable to 12 credits. Performing experience for the student dancer who has developed a professional level of competence.

DANC 388 Choreography III (3) Prerequisite: DANC 308 or equivalent. Repeatable to 6 credits. Theoretical and creative aspects of choreography for small groups. Emphasis on individual projects.

DANC 398 Directed Studies in Dance (1-6) Prerequisite: permission of department. Repeatable to 6 credits.

DANC 399 Practicum in Choreography, Production and Performance III (1-3) Prerequisite: DANC 299 or permission of department. Repeatable to 6 credits. Continuation of DANC 299.

DANC 410 Technical Theater Production for Dance (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: DANC 210 or equivalent (or permission of department). A study of the theoretical principles of production and the practical application of those principles to the presentation of dance works.

DANC 411 Dance Management and Administration (3) Principles of dance management and administration, including organization of touring, bookings, budgets, public relations, grantsmanship and audience development.

DANC 428 Advanced Ballet Technique I (1) Two hours of laboratory per week. Prerequisite: DANC 248. Repeatable to 3 credits. Advanced ballet technique with emphasis on physical and expressive skills.

DANC 429 Advanced Ballet Technique II (1) Two hours of laboratory per week. Prerequisite: DANC 428. Repeatable to 3 credits. Work in ballet technique for the professionally-oriented dancer.

DANC 448 Modern Dance V (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: DANC 349 or audition. Repeatable to 6 credits. Continuation of DANC 448.

DANC 466 Laban Movement Analysis (3) Introduction to Rudolf Laban’s system of qualitative movement analysis with relation to understanding personal movement style. Application to dance performance, teaching, composition and research.

DANC 471 Movement Behavior (3) The social psychology of movement; reciprocity of physical and emotional behavior.

DANC 479 Advanced Practicum in Dance (1-3) Repeatable to 6 credits. Advanced level performing experience for the student dancer who has developed an advanced professional level of competence.

DANC 482 History of Dance I (3) Prerequisite: DANC 200. The development of dance from primitive times to the Middle Ages and the relationship of dance forms to patterns of culture.

DANC 483 History of Dance II (3) Prerequisite: DANC 200. The development of dance from the Renaissance period to the present time and the relationship of dance forms to patterns of culture.

DANC 485 Seminar in Dance (3) Prerequisite: DANC 483. Senior standing. For DANC majors only. Formerly DANC 484. Analysis of dance through educational research, written documentation of the process, serving as a culmination of undergraduate study for dance majors.

DANC 498 Special Topics in Dance (1-3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Theoretical, choreographic, pedagogic, or performance study.

DANC 499 Practicum in Choreography, Production and Performance IV (1-6) Prerequisite: permission of department. Repeatable to 6 credits. Advanced workshop in dance presentation, including performing, production and planned field experiences.

EALL — East Asian Languages and Literatures

EALL 300 The Languages of East Asia (3) A survey of Chinese, Japanese, and Korean, and the languages of other East Asian nationalities. Provides a basic understanding of the structures of these languages. Topics covered include the characteristics of the writing systems of each; the phonological, metrical, and grammatical features of each; and the cultural, social, and historical settings. No knowledge of Asian languages is required. The course is taught in English.

ECON — Economics

ECON 105 Economics of Social Problems (3) Not open to students who have completed two of the following courses: ECON 103 or ECON 203, or ECON 205. An introduction to modern economic and social problems: their nature, causes, and policy implications.

ECON 200 Principles of Micro-Economics (4) Prerequisite: MATH 110 or placement in MATH 115 or above. It is recommended that students complete ECON 200 before taking ECON 201. Credit will be granted for only one of the following: ECON 200 or ECON 205. An introduction to the theories and methods of analysis of the systems, institutions, and policies of the household and the firm, and the role of markets and tariffs in the price determination process. Students in the College of Business and Management are required to take ECON 201 and should not take ECON 205. Not open to students who have completed two of the following courses: ECON 200 or ECON 205. One-semester introduction, for non-majors, to the principles of economics and the problems of society including: inflation, unemployment, poverty, urban renewal, income inequality, monopoly and market performance, environmental protection, and international trade.

ECON 305 Intermediate Macroeconomic Theory and Policy (3) Prerequisites: ECON 200; and ECON 201; and MATH 220. Analysis of the determination of national income, employment, and price levels. Discussion of consumption, investment, inflation, and government fiscal and monetary policy.

ECON 310 European Economic History (3) Prerequisite: ECON 200 and 201. The evolution of the capitalist system from its medieval origins to the present. Emphasis on dynamic forces of cumulative change in capitalism, including capital accumulation, technology, expansion of markets, the corporate form of private property in the means of production, and the relation of capitalism to war and revolution.

ECON 311 American Economic Development (3) Prerequisites: ECON 200 and 201. An introduction to the economic analysis of the major issues in the growth and development of the American economy. Basic economic theory related to such topics as agriculture, banks, industrialization, slavery, transportation, and the depression of the 1930’s.

ECON 315 Economic Development of Underdeveloped Areas (3) Prerequisites: ECON 200 and ECON 201 or ECON 205. Credit will be granted for only one of the following: ECON 315 or ECON 416. A study of the social characteristics of underdeveloped areas. Recent theories of economic development, obstacles to development, policies and planning for development.

ECON 316 Economic Development of Latin America (3) Prerequisites: ECON 201 and 205 or ECON 207 and 209 or ECON 220. The structure of financial institutions and the role in the provision of money and net worth. Analysis of the Federal Reserve System, the techniques of control of the supply of financial assets in stabilization policy. Relationship of money and credit to economic activity and the price level.

ECON 340 International Economics (3) Prerequisite: ECON 200 and ECON 201. Credit will be granted for only one of the following: ECON 340 or ECON 430. The study of international trade and the analysis of international transactions, exchange rates, and balance of payments. Analysis of policies of protection, devaluation, and exchange rate stabilization and their consequences.

ECON 350 Introduction to Public Sector Economics (3) Prerequisite: (ECON 200 and ECON 201) or ECON 205. Credit will be granted for only one of the following: ECON 350 or ECON 430. An introduction to the economic analysis of taxation, public expenditures, government budgeting, benefit-cost analysis and income redistribution, and their policy applications.
response to those interests. Students are advised to seek the instructor for information on the coverage and prerequisites during the registration period.

ECO 399 Individual Reading and Research For Undergraduates (1-3) Prerequisite: ECON 200, ECON 201, and permission of department. Repeatable to 6 credits if content differs. By arrangement with individual faculty members. The course is designed for students desiring specialized instruction and guidance in subjects not covered in the course offerings. Before beginning the course, the student must submit a written form listing an individual faculty member to act as their supervisor. A program of reading, research and evaluation will be worked out between the student and the faculty member.

ECO 401 Current Issues in American Economic Policy (3) Prerequisite: ECON 200 and ECON 201. Analysis of current economic problems and public policies, both domestic and international, including such topics as the measurement of crime, economic models, and the role of statistical theory. Formulation, estimation, and testing of econometric models. Topics covered include issues of autocorrelation, heteroscedasticity, functional form, simultaneous equation models, and qualitative choice models.

ECO 402 Macroeconomic Models and Forecasting (3) Prerequisite: ECON 305 or ECON 405. Analysis of the fluctuations in economic activity and the formulation and use of forecasting models of the economy. Illustrations of computer macro models and forecasting problems.

ECO 407 Advanced Macroeconomics (3) Prerequisite: ECON 305. An indepth analysis of current issues in macroeconomic theory and policy, including the role of trade and capital mobility in the world economy. Models of long term growth, the slow down in productivity growth, and concerns about U.S. competitiveness. Issues of the macroeconomic policy in an open economy. The efficacy of fiscal and monetary policies.

ECO 410 Comparative Institutional Economics (3) Prerequisite: ECON 306. Determinants of institutional arrangements and the economic consequences of those arrangements for economic growth using transaction costs economics, the new institutional economics, and elementary game theory. Historical emergence of market institutions and institutional arrangements in Europe and Japan. Unions and the manipulation of power, government regulations, poverty and distribution of income, federal budget and tax policy, environment.

ECO 412 Economic Development of Selected Areas (3) Prerequisite: ECON 306 and (ECON 315 or ECON 416). Not open to students who have completed ECON 418. Credit will be granted for only one of the following: ECON 412 or ECON 418. Formerly ECON 417. Institutional characteristics of a specific area are discussed and alternate strategies and policies for development are analyzed.

ECO 413 Information and Markets (3) Prerequisite: ECON 306. Presentations of economic theory, concentrating on information how information affects exchange and market outcomes, including insurance, signaling, reputations, and incentive contracts. Students applications to various markets and policy questions.

ECO 414 Game Theory (3) Prerequisites: ECON 306 and (MATH 220 or MATH 140). Credit will be granted for only one of the following: ECON 414 or ECON 417. Formerly ECON 414. An introductory course in game theory. Applications the foundations of game theory learned in ECON 414 to several important topics in business and economics. Emphasis is on topics of practical importance: negotiation, markets with few participants, prisoner’s dilemma and coordination.

ECO 416 Theory of Economic Development (3) Prerequisite: ECON 305 or ECON 405. Credit will be granted for only one of the following: ECON 315 or ECON 416. Economic theory of the developing nations; role of innovation, capital formation, resources, institutions, trade and exchange rates, and governmental policies.

ECO 422 Quantitative Methods in Economics I (3) Prerequisites: ECON 200; ECON 201; and ECON 321 or BMGT 230; or permission of department. Formal treatment of the relationship between economic problems and the assumptions employed in statistical theory. Formulation, estimation, and testing of econometric models, and introductions to multiple regression techniques, theory of identification, and issues relating to inference. Independent work relating the material in the course to an economic problem chosen by the student is required.

ECO 423 Quantitative Methods in Economics II (3) Prerequisite: ECON 422. Formal treatment of the relationship between economic problems and specification and estimation of econometric models. Topics include issues of autocorrelation, heteroscedasticity, functional form, simultaneous equation models, and qualitative choice models.

ECO 424 Computer Methods in Economics (3) Prerequisites: ECON 200; ECON 201; and (ECON 321 or BMGT 230). Computer modeling of economic problems, including household and firm behavior, macroeconomic relationships, statistical models of economy, and simulation models.

ECO 425 Mathematical Economics (3) Prerequisites: (ECON 305 or ECON 405) and (ECON 306 or ECON 406) and MATH 220 or equivalent. Mathematical developments of theory of economic behavior, both micro and macro, including modern welfare economics, market imperfections, and role of information.

ECO 431 Theory of Money, Prices and Economic Activity (3) Prerequisite: ECON 305 or ECON 405. Credit will be granted for only one of the following: ECON 330, ECON 430 or ECON 431. Monetary theory and the role of money, financial institutions and interest rates in macro models. Analysis of money demand and supply and of the Monetarist/Keynesian debate as they affect inflation and stabilization policy.

ECO 441 Theory of International Economics (3) Prerequisite: (ECON 305 or ECON 405) and ECON 406. Credit will be granted for only one of the following: ECON 340, ECON 440 or ECON 441. Theoretical treatment of foreign trade, balance of payments, monetary and exchange rate policies, and Heckscher-Ohlin theories of comparative advantage, analysis of tariffs and other trade barriers, international financial flows, balance of payments, exchange rate determination, and fiscal and monetary policy in an open economy.

ECO 451 Public Choice and Public Policy (3) Prerequisite: ECON 306. Analysis of collective decision making, economic models of government, program budgeting, and policy implementation. Emphasis is on models of public choice and institutions which affect decision making.

ECO 454 Theory of Public Finance and Fiscal Federalism (3) Prerequisite: ECON 306 or ECON 406. Credit will be granted for only one of the following: ECON 450 or ECON 454. Study of welfare economics and the theory of public goods, taxation, public choice, benefit-cost analysis, and state and local finance. Applications of theory to current policy issues.

ECO 456 Law and Economics (3) Prerequisite: ECON 306. Relationship of the exchange process to the system of institutions and rules that society develops to carry out economic functions. Topics covered include: Property rights, torts, negligence, and liability; contracts and criminal law; and criminal and civil law. Applications of theory to current policy issues.

ECO 460 Industrial Organization (3) Prerequisite: ECON 306 or ECON 440. Changing structure and performance of industry, price policies in different industrial classifications of monopoly and competition in relation to problems of public policy.

ECO 465 Health Care Economics (3) Prerequisite: ECON 306. Analysis of health care, the organization of its delivery and payment, the economics of hospitals, physicians, and the drug industry; role of technology, and limits on health care spending.

ECO 470 Theory of Labor Economics (3) Prerequisite: ECON 306. Credit will be granted for only one of the following: ECON 370 or ECON 470. An analytical treatment of theories of labor markets. Marginal productivity theory of labor demand; allocation of time in household labor supply models; theory of human capital; earnings differentials; market structure and the efficiency of labor markets; the role of trade unions; discrimination; and unemployment.

ECO 471 Current Problems in Labor Economics (3) Prerequisite: ECON 470. Changing structure and performance of industry, price policies in different industrial classifications of monopoly and competition in relation to problems of public policy.

ECO 476 American Living Standards and Poverty (3) Prerequisites: ECON 305 and department. Economic analysis of consumption, income inequality, poverty and income distribution; role of government. Also offered as PUAF 730. Post-World War II trends in U.S. living standards and income inequality. Areas covered include: industrialization and urban growth, the role of demographics, international competitiveness and the structure (and holders) of debt as they affect the level of U. S. income and income inequality.
EDCI 273 Practicum in Ceramics (3) Eight hours of laboratory per week. For EDCI majors only. Not open to students who have completed a ceramics course. Formerly EDCI 273. A lecture-studio course in the use of clay and ceramics in a wide variety of educational settings.

EDCI 280 School Service Semester (3) Development of conceptual understanding of the teaching-learning process. Seminar to coordinate on-and-off-campus experiences. Two hours each week on campus with an arranged six hours each week in schools.

EDCI 288 Special Topics in Teacher Education (1-3) Prerequisite: permission of department. Repeatable to 6 credits if content differs.

EDCI 298 Special Problems in Teacher Education (1-6) Prerequisite: permission of department. Repeatable to 6 credits if content differs.

EDCI 300 Discipline Based Art Education (C & I Art Methods) (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 420. For art education majors only. Methods of discipline based art education which reflects teaching of art history, appropriate methods, lesson plans, textbooks, and hours of field work. Basic methods course in art education. Fullfills requirements for a special methods course.

EDCI 301 Teaching Art in the Elementary School (3) For elementary and pre-elementary education majors only. Not open to majors in other disciplines. Art methods course for elementary schools. Includes laboratory experiences with materials appropriate for elementary schools. Emphasis on emerging areas of art education for the elementary classroom teacher.

EDCI 314 Teaching Language, Reading, Drama and Literature with Young Children (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 312; EHDG 313; EHDG 419A; and EHDG 416. For early childhood education majors only. Introduction to the teaching of reading in the context of the language arts, beginning reading instruction, and selection of materials and literature.

EDCI 315 The Young Child in the Social Environment (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 312; EHDG 313; EDCI 314; EHDG 416; and EHDG 419A. For early childhood education majors only. The child's understanding of people, social roles, society and various cultures; communicative skills and ability to develop satisfying relationships with peers and adults. Related techniques, materials and resources included.

EDCI 316 The Teaching of Reading: Early Childhood (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 312; EHDG 313; EDCI 314; EHDG 416; and EHDG 419A. Corequisites: EDCI 315; EDCI 351; EDCI 374; and EHDG 419B. For early childhood education majors only. The child's understanding of people, social roles, society and various cultures; communicative skills and ability to develop satisfying relationships with peers and adults. Related techniques, materials and resources included.

EDCI 320 Curriculum and Instruction in Secondary Education: Social Studies/ (3) History Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 413; EHDG 420; and EDCI 390. For education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to social studies education. Emphasis on multicultural education. Includes emphasis on multicultural education.

EDCI 321 Curriculum and Instruction in Secondary Education: Social Studies/ (3) Geography Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHD 305E; and EDCI 390. For education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to social studies education. Emphasis on multicultural education. Includes emphasis on multicultural education.

EDCI 322 Curriculum and Instruction in Elementary Education: Social Studies/ (3) Geography Prerequisites: admission to teacher education program; 2.5 GPA; EDCI 397; EHD 300E; permission of department. Corequisites: EDCI 342; EDCI 352; EDCI 360; EDCI 416; and EDCI 419B. For elementary education majors only. Objectives, curriculum, organization and methods of teaching, evaluation of materials, and utilization of environmental resources. Emphasis on multicultural education. Includes laboratory/field experiences.

EDCI 330 Curriculum and Instruction in Secondary Education: Foreign Language/ (3) Arts Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 413; EHDG 420; and EDCI 390. For education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks, and other instructional materials, measurement, and other topics pertinent to foreign language education.

EDCI 340 Curriculum and Instruction in Secondary Education: English/ (3) Theatre/ (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 413; EHDG 420; and EDCI 390. Corequisites: EDCI 322; EDCI 325; EDCI 350; EDCI 351; EDCI 352; EDCI 374; and EHDG 419A. For education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and other topics pertinent to English education.

EDCI 342 Curriculum and Instruction in Elementary Education: Social Studies/ (3) Arts Prerequisites: admission to teacher education program; 2.5 GPA; EDCI 397; EHD 300E; and permission of department. Corequisites: EDCI 322; EDCI 342; EDCI 352; and EDCI 374. For elementary education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and other topics pertinent to foreign language education. Includes laboratory/field experiences.

EDCI 347 The Teaching of Science: Early Childhood (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EHDG 312; EDCI 314; EHDG 419A; and EHDG 419B. Coerequisites: EDCI 313; EDCI 315; EDCI 316; EDCI 351; and EHDG 419B. For early childhood education majors only. Objectives, materials, and activities for teaching science to young children. Includes classroom and field experience.

EDCI 380 Curriculum and Instruction: Elementary (3) Focuses on developmental needs at various age levels, with emphasis upon the activities, materials and methods by which educational objectives are attained.

EDCI 381 Schools and Children (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department. Corequisites: one of the following: EDCI 385; or EDCI 487; or EDIT 406; or EDIT 477; or EDSP 480. A first-level survey of instructional uses of microcomputers, software, and related technology for pre-service teachers.

EDCI 390 Principles and Methods of Secondary Education (3) Prerequisites: admission to teacher education program and 2.5 GPA; permission of department. Co-requisites: EDCI 315; EDCI 325; EDCI 352; and EDCI 374. For education majors only. Principles and methods of teaching in junior and senior high schools. Instructional problems common to all of the subject fields, considered in relation to the needs and interests of youth, social problems and the central values of society.

EDCI 397 Principles and Methods of Teaching in Elementary Schools (3) Prerequisites: admission to teacher education program and 2.5 GPA; permission of department. Co-requisites: EDCI 315; EDCI 325; EDCI 352; and EDCI 374. For education majors only. Materials and procedures to help young children develop mathematical meanings and relationships and problem solving skills. Development of the understanding of number, geometric, spatial, and simple logical relationships and problem solving skills. Includes field experiences.

EDCI 398 Principles and Methods of Teaching in Elementary Schools (3) Prerequisites: admission to teacher education program and 2.5 GPA; permission of department. Co-requisites: EDCI 315; EDCI 325; EDCI 352; and EDCI 374. For education majors only. Materials and procedures to help children sense arithmetic meanings and relationships. Development of an understanding of the number system and arithmetical processes. Includes laboratory/field experiences.

EDCI 399 Field Experience in Art Education (1) Prerequisites: admission to teacher education program and 2.5 GPA; permission of department. Co-requisites: EDCI 315; EDCI 325; EDCI 352; and EDCI 374. For education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to social studies education. Emphasis on multicultural education. Includes emphasis on multicultural education.

EDCI 401 Student Teaching in Elementary School: Art (4-6) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; and EDCI 300. For art education majors only. Art teaching major only. Laboratory experiences in teaching in all areas of the curriculum, uses of children's literature, the program in word analysis, and diagnostic techniques.

EDCI 406 Computers, Art and Chaos Theory (3) Prerequisite: admission to education program. Focuses on the use of computers, software, and related technology for pre-service teachers in pre-service teacher education programs. Three mandatory laboratory hours each week. For EDCI majors only. Not open to students who have completed a computer course. Formerly EDIT 273. A lecture-studio course to develop skills, material resources, and educational strategies for three-dimensional projects in visual art education.

EDCI 407 Practicum in Art Education: Three-Dimensional (3) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department. Co-requisites: EDCI 315; EDCI 325; EDCI 352; and EDCI 374. For education majors only. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to social studies education. Emphasis on multicultural education. Includes laboratory/field experiences.

EDCI 413 Methods of Teaching ESL in Elementary Schools (3) Prerequisites: EDCI 434 or permission of department. Analysis of elementary school classroom culture, social contexts, and instructional strategies which foster language development in elementary school children. Provides context for understanding the development of second language acquisition. Consistent with current theories of child second language acquisition. For undergraduate and graduate art and current teachers of English to speakers of other languages.
EDCI 481 Student Teaching: Elementary (12) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EDCI 322; EDCI 342; EDCI 352; EDCI 362; and EDCI 372. Co-requisite: EDCI 464.

EDCI 484 Student Teaching in Elementary School: Music (4-6) Prerequisites: admission to teacher education program; 2.5 GPA; permission of departments: MUED 411; MUED 420; MUED 470; MUED 471; and MUED 472. Co-requisite: EDCI 494. Fullfills elementary teaching requirements in K-12 music education programs.

EDCI 485 Student Teaching in Elementary School: Physical Education (4-6) Prerequisite: permission of department. For EDCI majors only. Fullfills elementary teaching requirements in K-12 physical education programs.

EDCI 486 Supervision of Student Teachers (1-3) Designed for in-service teachers. The development and refinement of skills in observing, evaluating and conducting conferences with student teachers. Clinical supervision and cooperative problem solving. Required by some school systems for supervision of student teachers.

EDCI 488 Selected Topics in Teacher Education (1-3) Prerequisite: major or permission of department. Repeatable to 6 credits if content differs.

EDCI 489 Field Experiences in Education (1-4) Prerequisite: permission of department. Co-requisite: EDCI 497. Repeatable to 4 credits.

EDCI 491 Student Teaching in Secondary Schools: Health (12) For EDCI majors only.

EDCI 494 Student Teaching in Secondary Schools: Music (2-8) For EDCI majors only.

EDCI 495 Student Teaching in Secondary Schools: Physical Education (2-8) For EDCI majors only.

EDCI 497 The Study of Teaching (3) Prerequisite: EDCI 481. Co-requisite: EDCI 489. Identification and examination of learner and teacher outcome variables related to teaching systems, methods, processes. Methods of conducting classroom research.

EDCI 498 Special Problems in Teacher Education (1-6) Prerequisite: permission of department. For EDCI majors only. Repeatable to 6 credits. Individual study of approved problems.

EDCI 499 Workshops, Clinics, and Institutes (1-6) Repeatable to 6 credits. The following types of educational enterprise may be scheduled under this course heading: workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences in pupil testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.

EDCP — Education Counseling and Personnel Services

EDCP 108 College and Career Advancement: Concepts and Skills (1) Repeatable to 3 credits if content differs. Knowledge and skills designed to enhance college as a learning experience or preparation for life.

EDCP 310 Peer Counseling Theory and Skills (3) The theories and skills of peer helping relationships. Counseling theories and skills at a level appropriate for students seeking basic level training for use in peer counseling settings.

EDCP 312 Multi-Ethnic Peer Counseling (3) Prerequisite: Undergraduate Status. 30 semester hours. Knowledge, skills, and attitudes to function as peer helpers of Multi-Ethnic students.

EDCP 317 Introduction to Leadership (3) Application of leadership theories, concepts, and skills. Completion of personal and leadership selfassessments, values exploration, and leadership skill practice through course activities.

EDCP 318 Leadership and Community Service (3) Three hours of lecture and five hours of laboratory per week. Prerequisite: permission of department. Repeatable to 6 credits if content differs. Course will utilize experiential learning opportunities to develop knowledge and skills in the area of leadership and community service. Provides an opportunity for leadership in the integration of leadership and community service.

EDCP 325 Substance Use and Abuse in American Society (3) Incidence, etiology, effects and management of substance use and abuse from the perspective of the individual, the family, and community.

EDCP 411 Principles of Mental Health (3) Prerequisite: nine semester hours in the area of mental health. Development of awareness of the impact of mental health pertinence on a community. Development of the role of the mental health professional in the community. Development of skills necessary to function as a mental health professional.

EDCP 416 Theories of Counseling (3) An overview and comparison of the major theories of counseling, including an appraisal of their utility and empirical support.

EDCP 417 Advanced Leadership Seminar (3) Prerequisite: EDCP 317 or permission of department. A study of the central components of counseling in the functional areas of personal values, decision making, and the integration of these concepts. Development of the role of the mental health professional in the community. Development of skills necessary to function as a mental health professional.

EDCP 418 Special Topics in Leadership (3) Prerequisite: EDCP 317 or equivalent; permission of department. Repeatable to 6 credits if content differs. The course will address a single topic related to leadership through the semester. In-depth study and analysis on the topic will be the basis for a paper and/or project. Focus on the impact of the special topics and leadership on society.

EDCP 420 Education and Racism (3) Strategy development for counselors and educators to deal with problems of racism.

EDCP 460 Introduction to Rehabilitation Counseling (3) Survey of principles and techniques involved in the vocational rehabilitation of persons with disabilities.

EDCP 461 Psycho-Social Aspects of Disability (3) Theory and research concerning disability, with emphasis on crisis theory, loss and mourning, handicapped as a deviant role. Survey of the effects of disability on group experiences which contribute to the individual's process and coping. Implications for counseling and the rehabilitation process.

EDCP 462 Disability in American Society (3) Prerequisite: Undergraduate Status. 30 semester hours. Critical examination of the history of legislation and analysis of current policies toward severely physically and mentally disabled persons.

EDCP 470 Introduction to Student Personnel (3) Prerequisite: permission of department. A systematic analysis of research and theoretical literature on a variety of major problems in the fields of personnel services in higher education. Included will be discussion of such topics as the student personnel philosophy in education, counseling services, discipline, financial aid, health, remedial services, etc.

EDCP 489 Field Experiences in Counseling and Personnel Services (1-4) Prerequisite: permission of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDCP 498 Special Problems in Counseling and Personnel Services (1-3) Prerequisite: permission of department. Available only to major students who have formal plans for individual study of approved problems.

EDCP 499 Workshops, Clinics, and Institutes (1-6) Repeatable to 6 credits. The following types of educational enterprise may be scheduled under this course heading: workshops conducted by the Department of Counseling and Personnel Services (or developed cooperatively with other departments, colleges and universities) and not otherwise covered in the present course listing; clinical experiences in counseling and testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups.

EDHD — Education, Human Development

EDHD 230 Human Development and Societal Institutions (3) Prerequisite: admission to teacher education program over a period of time. In-depth study and analysis on the topic will be the basis for a paper and/or project. Focus on the impact of the special topics and leadership on society.

EDHD 300 Human Development and Learning (6) Prerequisite: admission to teacher education program. Major concepts and theories of human development and learning and their application to the field of education. The development of the individual and the family through stages of the lifespan. Continuity and change within the developing individual.

EDHD 311 Positive Human Development Aspects of the Helping Relationship (3) Development of skills and theoretical knowledge relevant to the helping relationship. Relating, communicating, and problem-solving with others. In-class training activities and field experiences for acquiring interpersonal competence.

EDHD 350 Human Development Factors in Personal Development (3) Personality dynamics including self-study and group experiences which contribute to personal and social development and insight. Emphasis on factors which enhance optimal personal growth.

EDHD 400 Introduction to Gerontology (3) Multidisciplinary survey of the processes of aging. Physiological changes, cultural forces, and self-processes that bear on quality of life in later years. Field study of programs, institutions for elderly, individual elders, their families and care providers.

EDHD 401 Promoting Optimal Aging (3) Prerequisite: EDHD 320, EDHD 400, or permission of department. Also offered as EDCI 401 or EDCI 641. Relationship of the nursery school to the home, school and community.

EDHD 410 The Child and the Curriculum: Early Childhood (3) Credit will be granted for only one of the following: EDHD 410 or EDCI 410. Formerly EDCI 410. Relationship of the nursery school to the home, school and community.

EDHD 413 Adolescent Development (3) Adolescent development, including special problems encountered in contemporary culture. Observational component and individual case study.

EDHD 416 Scientific Concepts in Human Development (3) Guiding research and observation of students through the school year. Impact of family, school, society, and peer group on individual. Analysis of field data in terms of developmental patterns.

EDHD 417 Laboratory in Behavior Analysis (3) Prerequisite: EDHD 416. Continuation of analysis of field observations; emphasis on the application of theories of motivation, self-concept, attitudes and values.

EDHD 419 Human Development and Learning in School Settings (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Advanced study of human development and learning in different phases of school program over a period of time.

EDHD 420 Cognitive Development and Learning (3) Prerequisite: EDHD 300; EDHD 320; EDHD 411; PSYC 355; PSY 410, or permission of department. Current developmental theories of cognitive processes such as language, memory, and intelligence and how differences in cognitive level (infancy through adolescence) mediate learning of educational subject matter.
Approved Courses

EDHD 421 Student Teaching: Preschool (4) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EDHD 312; EDHD 313; EDHD 419A; EDHD 419B; and EDHD 416. For early childhood education majors only. Credit will be granted for only one of the following: EDHD 421 or EDCI 411. Formerly EDCI 411.

EDHD 422 Students Teaching: Kindergarten (4) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EDHD 312; EDHD 313; EDHD 419A; EDHD 419B; and EDHD 416. For early childhood education majors only. Credit will be granted for only one of the following: EDHD 422 or EDCI 412. Formerly EDCI 412.

EDHD 423 Student Teaching: Primary Grades (8) Prerequisites: admission to teacher education program; 2.5 GPA; permission of department; EDHD 312; EDHD 313; EDHD 419A; EDHD 419B; and EDHD 416. For early childhood education majors only. Credit will be granted for only one of the following: EDHD 423 or EDCI 413. Formerly EDCI 413.

EDHD 430 Adolescent Violence (3) Prerequisite: PSYC 100; EDHD 300; or permission of department. Examines the roots of violence among adolescents and the extent to which this constitutes a problem in various settings. Research studies on its origins, development, and intervention and implications for social policy are examined.

EDHD 445 Guidance of Young Children (3) Prerequisite: PSYC 100; EDHD 306; or permission of department. Practical aspects for helping and working with children, drawing on research and on school and community observation. Implications for day care and other public issues.

EDHD 460 Educational Psychology (3) Prerequisite: PSYC 100; EDHD 306; or permission of department. Application of psychological principles and theories. Differences, treatment, school and community, and work with families. Exposure, intervention, and development of plans for individual study of approved problems relative to their preparation for teaching.

EDHD 489 Field Experiences in Education (1-4) Prerequisite: permission of department. Repeatable to 4 credits. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDHD 498 Special Problems in Education (1-3) Prerequisite: permission of department only to students who have definite plans for individual study of approved problems.

EDHD 499 Workshops, Clinics, and Institutes (1-6) Repeatable to 6 credits. The following type of educational enterprise may be scheduled under this course heading: workshop conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences; practicum experience in educational enterprises; workshops; reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals, and supervisors.

EDMS — Measurement, Statistics, and Evaluation

EDMS 410 Classroom Assessment (3) Junior standing. Developing and using classroom assessments, including tests, performance assessments, rating scales, portfolios, observations, and interactions; basic psychometric statistics; standard setting; grading; communicating assessment information; testing ethics; locating and evaluating measures; program evaluation and classroom research; assessments used for educational policy decisions.

EDMS 451 Introduction to Educational Statistics (3) Junior standing. Introduction to statistical reasoning; location and dispersion measures; computer applications; regression and correlation; statistical test; inferential statistics; one-way analysis of variance; analysis of contingency tables.

EDMS 465 Algorithmic Methods in Educational Research (3) Prerequisite: EDMS 451 or equivalent. Use of the computer as a tool in educational research. Instruction in a basic scientific computing language as well as experience in program writing for solving statistical and educational research problems.

EDMS 489 Field Experiences in Measurement and Statistics (1-4) Prerequisite: permission of department. Repeatable to 4 credits. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDMS 498 Special Problems in Measurement and Statistics (1-3) Prerequisite: permission of department. Repeatable to 6 credits. Available only to education majors who have formal plans for individual study of approved programs.

EDPL — Education Policy and Leadership

EDPL 201 Education in Contemporary American Society (3) An examination of the relationship between education and the social environment in contemporary American society. Issues of equality, social opportunity, individual and group differences, education outside of schools, the control of education, and the future of education.

EDPL 210 Historical and Philosophical Perspectives on Education (3) A study of the historical and philosophical origins of educational philosophy and policies. Emphasis on the social and philosophical issues that the educational enterprise may be scheduled under this course heading. Examination of the future of our social and cultural institutions and the role of education in these changes. Course constitutes a problem in various settings. Research studies on their origins, development, and intervention and implications for social policy are examined.

EDPL 288 Special Problems in Education (1-4) Prerequisite: permission of department. Formerly EDPA 489. Available only to freshmen and sophomore majors who have definite plans for individual study of approved problems relative to their preparation for teaching.

EDPL 301 Foundations of Education (3) Prerequisite: junior standing and admission to teacher education; or Bachelor's degree with permission of department. Social context of education and conflicts over philosophies, values, and goals that may be reflected in educational institutions in our pluralistic society. Helps teachers become reflective, critical thinkers about the social and philosophical issues they face and the choices they make.

EDPL 400 The Future of the Human Community (3) Examination of the social and cultural institutions in which we live, the effects of human behavior on education and child rearing, social and family relationships, health and leisure, information exchange, and the provision of food, clothing, and shelter. Prerequisite: EDPL 288.

EDPL 401 Education, Technology, Policy, and Social Change (3) Junior standing. Formerly EDPA 401. Examination of technology as a complex force which influences social change and the educational development of individuals.

EDPL 440 Educational Media (3) Survey of classroom uses of instructional media. Techniques for integrating media into instruction. Includes preparation of a unit of instruction utilizing professional and teacher-produced media.

EDPL 488 Special Topics in Education Policy and Administration (1-3) Prerequisite: permission of department. Repeatable to 6 credits. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences; practicum experience in educational enterprises; workshops; reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals, and supervisors.

EDSP — Education, Special

EDSP 288 Special Topics in Teacher Education (1-3) Prerequisite: major in education or permission of department. Repeatable to 6 credits if content differs.

EDSP 298 Special Problems in Teacher Education (1-4) Prerequisite: permission of department. Available only to freshmen and sophomore majors who have definite plans for individual study of approved problems relative to their preparation for teaching. Credit according to extent of work.

EDSP 330 Families and the Education of Handicapped Children (3) Prerequisite: EDSP 321 or permission of department. Corequisites: EDSP 400, EDSP 402, EDSP 420, or EDSP 460. Formerly EDSP 322. Practicum experience in settings serving severely disabled individuals. Field placement for two to five half-day periods.

EDSP 331 Introduction to Curriculum and Instructional Strategies (3) Prerequisite: EDSP 289. Credit will be granted for only one of the following: EDSP 331 or EDSP 431. For EDSP majors only. Instructional principles and programs in special education.

EDSP 332 Interdisciplinary Communication in Special Education Prerequisites: EDSP 289, EDSP 320, EDSP 331, or EDSP 431. Formerly EDSP 333. For EDSP majors only. Terminology, procedures, and professional roles specific to persons providing services to handicapped children.

EDSP 349 Student Teaching of Exceptional Children (8) For EDSP majors only. Student teaching full-time for eight weeks with exceptional children.

EDSP 376 Fundamentals of Sign Language (3) Receptive and expressive skills in American Sign Language. Examination of the causes of deafness, characteristics of deaf education, and effects of the culture of the deaf upon the development of a deaf education system.

EDSP 400 Assessment, Curriculum and Instructional Methods For Students with Severe Disabilities Corequisites: EDSP 402 or EDSP 431 or permission of department. Examination of functional assessment procedures, curriculum development and analysis, and instructional techniques for students with severe disabilities.

EDSP 401 Environmental Adaptations for Severely Handicapped Students (3) Prerequisite: EDSP 400 or permission of department. For EDSP majors only. Assessment, curriculum, and instruction for students with physical disabilities. Focus on etiology, environmental and learning adaptations, and assistive technology.

EDSP 404 Education of Students with Autism (3) Prerequisite: EDSP 400 and EDSP 402 or EDSP 409 or permission of department. Practicum experience in settings serving severely disabled individuals. Field placement for two to five half-day periods.

EDSP 405 Field Placement: Severely Disabilities II (2-5) Prerequisites: EDSP 402 or permission of department. Prerequisites: EDSP 400; and EDSP 403; and EDSP 410 or permission of department. Practicum experience in settings serving severely disabled individuals. Field placement for two to five half-day periods.

EDSP 406 Field Placement I (1-3) For EDSP majors only. Credit will be granted for only one of the following: EDSP 402 or EDSP 406. Formerly EDSP 322. Practicum experience in special education.

EDSP 410 Community Functioning Skills for Students with Severe Disabilities (3) Prerequisite: EDSP 400 or permission of department. Corequisites: EDSP 330; EDSP 403; and EDSP 410 or permission of department. Practicum experience in settings serving severely disabled individuals. Field placement for two to five half-day periods.

EDSP 411 Field Placement: Severe Disabilities (2) Prerequisite: EDSP 405. Credit will be granted for only one of the following: EDSP 402 or EDSP 411. Formerly EDSP 321. Use of applied behavior analysis for assessment of behavior and learning environments. Design of behavior and classroom management of students in special education.

EDSP 412 Supervision and Instruction In Special Education (3) Prerequisite: EDSP 411. For EDSP majors only. Assessment and instruction of reading and writing skills for students in special education.

EDSP 417 Student Teaching: Severe Disabilities (4-11) Student teaching, full-time for twelve weeks, with severely disabled individuals. Limited to special education majors admitted to severely handicapped specialty area.
EDSP 418 Seminar: Issues and Research Related to the Instruction of Severe Disabilities (1-3) Prerequisite: permission of department. For EDSP majors only. Repeatable to 6 credits if content differs. Current issues and research relating to the instruction of severely disabled individuals.

EDSP 420 Developmental and Behavioral Characteristics of Non-handicapped and Handicapped Infants and Young Children Co-requisites: EDSP 421 or EDSP 441) or permission of department. Study of the developmental, behavioral, and learning characteristics of non-handicapped and handicapped infants and young preschool children.

EDSP 421 Field Placement: Early Childhood Special Education I (2-4) Pre- or corequisite: EDSP 420; and EDCL 410. Practicum experience in settings serving preschool handicapped children. Opportunities for studying the patterns of development and learning among non-handicapped and handicapped infants and older preschoolers. Enrollment limited to students admitted to early childhood specialty. Field placement for two or three half-days per week.

EDSP 422 Curriculum and Instruction in Early Childhood Special Education (3) (Moderate to Mild: 3-8) Years) Prerequisites: EDCL 411; and EDSP 420; or permission of department. Co-requisites: EDSP 330; and EDSP 424. Characteristics, methods and materials for the instruction of young children (ages 3-8) traditionally labeled mild to moderately handicapped.

EDSP 423 Assessment of Preschool Handicapped Children and Infants (3) Prerequisites: EDSP 330; and EDSP 422. Co-requisites: EDSP 430; EDSP 431; and (EDSP 400 or EDSP 444). Current psycho-educational assessment and evaluation procedure for young children. Administration and interpretation of selected assessment instruments.

EDSP 424 Field Placement: Early Childhood Special Education II (Moderate to Mild: 3-8) Years) Prerequisites: EDSP 330 and EDSP 422. Practicum experience in settings serving young children (ages 3 to 8) mild to moderately handicapped children in self-contained and integrated early childhood programs. Opportunities to apply educational methods and materials. Field placement for two to four half-days per week.

EDSP 430 Intervention Techniques and Strategies For Preschool Handicapped (3) Children and Infants (Severe to Moderate: 4-5 Years) Prerequisites: EDSP 330 and EDSP 422. Corequisites: EDSP 433; and EDSP 431; and EDSP 400 or EDSP 441). Current approaches to the treatment of preschool severity to moderately handicapped children.

EDSP 431 Field Placement: Early Childhood Special Education (3) Co-requisite: EDSP 330 or EDSP 440). Field placement for two months with opportunities to work with handicapped infants and preschool children. Limited to special education majors in early childhood special education specialty area.

EDSP 438 Seminar: Special Issues in Early Childhood Special Education (1-3) Prerequisite: permission of department. For EDSP majors only. Repeatable to 6 credits if content differs. Study of current issues and research concerning education of preschool handicapped children.

EDSP 440 Assessment and Instructional Design for the Educationally Handicapped: Cognitive and Psychosocial Development (3) Prerequisites: EDSP 441 and EDCL 456) or permission of department. Co-requisites: EDSP 330 and EDSP 445. Learning style, cognitive, and problem-solving strategies, and psychosocial behavior of educationally handicapped individuals at elementary to secondary levels. Characteristics, assessment and instruction. Enrollment limited to Special Education majors accepted into educationally handicapped area of specialization.

EDSP 441 Assessment and Instructional Design for the Educationally Handicapped: Oral Language and Communication Disorders (3) Corequisites: EDSP 442 or EDSP 431) or permission of department. Characteristics of individuals with language and communication disorders. Assessment of such disorders and instructional strategies, curricula and materials.

EDSP 442 Field Placement: Educationally Handicapped I (2-4) Pre- or corequisite: EDSP 441 and EDCL 456) or permission of department. Practicum experience in settings serving educationally handicapped individuals. Demonstration of the instructional design for the educationally handicapped. Field placement for two or three half-days per week.

EDSP 443 Assessment and Instructional Design for the Handicapped: Reading (3) and Written Communication (3) Co-requisites: EDSP 441; and EDSP 321) or permission of department. Pre- or co-requisites: EDSP 331; and EDSP 332; and EDSP 433. Characteristics and assessments of individuals with specific learning disorders, and procedures of teaching reading and written language skills to such individuals. Adaptation of regular instructional methods and curricula.

EDSP 445 Field Placement: Educationally Handicapped II (2- 4) Prerequisites: EDSP 444; and co-requisites: (EDSP 330; and EDSP 440) and EDSP 443). Practicum experience in settings serving educationally handicapped children. Field placement for 2 to 4 half-days per week.

EDSP 446 Instructional Design and Classroom Management Strategies For (3) (Moderate: 3-8 Years) Prerequisites: EDSP 445; and permission of department. Instructional methods and classroom management skills needed to teach middle and high school students with disabilities.

EDSP 447 Field Placement: Educationally Handicapped III (2- 4) Prerequisite: EDSP 445 or permission of department. Pre- or co-requisites: EDSP 446; EDSP 450; and EDSP 460. Practicum experience in settings serving educationally handicapped individuals. Field placement for two to four half-days per week.

EDSP 450 Inclusive Practices in the Schools (3) Corequisite: EDSP 411 or EDSP 431 or EDSP 447 or EDSP 465). Educational practices regarding inclusive education in the schools for students with and without disabilities.

EDSP 457 Student Teaching: Educationally Handicapped (4- 11) For EDSP majors only. Student teaching, full-time for twelve weeks, with educationally handicapped individuals.

EDSP 458 Seminar: Special Issues and Research Related to the Education of Exceptional Children (3) Prerequisites: EDSP 441 or EDSP 443 or EDSP 447 or EDSP 445). Current issues and research concerning the education of educationally handicapped individuals.

EDSP 460 Introduction to Secondary/Transition Special Education (3) Corequisites: EDSP 461, EDSP 411, or EDSP 447) or permission of department. For EDSP majors only. Historical and current issues, legislation, and service delivery options for youth with disabilities.

EDSP 461 Field Placement: Secondary/Transition I (2-4) Pre- or corequisite: EDSP 460). Field placement for two half-days per week.

EDSP 462 Vocational Assessment and Instruction in Special Education (3) Prerequisite: EDSP 460 or permission of department. Interpretation of assessment results, and planning, delivery and evaluation of instruction in vocational education for secondary students with disabilities.

EDSP 463 Field Placement: Secondary/Transition II (2-4) Prerequisite: EDSP 461 or permission of department. Pre- or corequisite: EDSP 462. For EDSP majors only. Practicum experience in secondary/transition programs for individuals with disabilities. Field placement for two half-days per week.

EDSP 465 Field Placement: Secondary/Transition III (2-4) Prerequisite: EDSP 463. Pre- or corequisite: EDSP 464. For EDSP majors only. Practicum experience in secondary/transition programs for individuals with disabilities. Field placement for three or four half-days per week.

EDSP 466 Secondary and Transition Methods in Special Education (3) Prerequisite: EDSP 460 or permission of department. Current secondary vocational education issues and transition methods including work-study programming, job development, and job coaching.

EDSP 467 Student Teaching: Secondary/Transition (4-11) For EDSP majors only. A full-time twelve week field assignment in a setting providing secondary transition services to individuals with disabilities. Enrollment is limited to special education majors who have successfully completed coursework in the secondary/transition area of specialization.

EDSP 468 Special Topics Seminar in Secondary/Transition Issues and Problems Related to Special Education majors only. Repeatable to 6 credits if content differs. Current issues and research relating to secondary/transition services for individuals with disabilities.

EDSP 470 Introduction to Special Education (3) Designed to help understand the needs of all types of exceptional children.

EDSP 471 Characteristics of Exceptional Children: Mentally Retarded (3) Prerequisite: EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of exceptional children.

EDSP 472 Education of Exceptional Children: Mentally Retarded (3) Prerequisite: EDSP 471 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged.

EDSP 473 Curriculum For Exceptional Children: Mentally Retarded (3) Prerequisite: EDSP 471 or equivalent. Examines the principles and objectives guiding curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use.

EDSP 475 Education of the Slow Learner (3) Studies the characteristics of the slow learner and those educational practices which are appropriate for the child who is functioning as a slow learner.

EDSP 476 Communicating with Sign Language (3) Prerequisite: EDSP 376 or permission of department. Immediate level receptive and expressive skills in American Sign Language. Aspects of the culture, history, and research perspectives of the deaf community.

EDSP 480 Microcomputers in Special Education (3) Credit will be granted for only one of the following: EDCL 385, EDCL 480, EDCL 477, or EDCL 491. Microcomputers for the education of handicapped individuals.

EDSP 481 Characteristics of Exceptional Children: Gifted and Talented (3) Prerequisite: EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of gifted and talented children.

EDSP 482 Education of Exceptional Children: Gifted and Talented (3) Prerequisite: EDSP 481 or equivalent. Offers practical and specific methods of teaching gifted and talented children. Selected observation of actual teaching may be arranged.

EDSP 483 Curriculum For Exceptional Children: Gifted and Talented (3) Prerequisite: EDSP 481 or equivalent. Examines the principles and objectives guiding current curriculum for gifted and talented children: gives experience in developing curriculum; studies various curricula currently in use.

EDSP 488 Selected Topics in Teacher Education (1) Prerequisite: major in education or permission of department. Repeatable to 6 credits if content differs.

EDSP 489 Field Experiences in Special Education (1) Prerequisite: permission of department. Planned field experience in educational settings for individuals with disabilities; gives experience in special education settings; studies various curricula currently in use.

EDSP 491 Characteristics of Learning Disabled Students (3) Prerequisite: EDSP 470 or permission of department. Diagnosis, etiology, physical, social, and emotional characteristics of learning disabled students.

EDSP 492 Education of Learning Disabled Students (3) Prerequisite: EDSP 491 or permission of department. Methods of teaching learning disabled children.

EDSP 493 Curriculum For Exceptional Children: Learning Disabilities (3) Prerequisite: EDSP 492 or equivalent. Principles and objectives guiding curriculum for children with learning disabilities; gives experience in developing curriculum; studies various curricula currently in use.

EDSP 498 Special Problems in Special Education (1-3) Prerequisite: permission of department. Available only to EDSP majors who have successfully completed approved problems. Credit according to extent of work.

EDSP 499 Workshops, Clinics, and Institutes in Special Education (1-6) Repeatable to 6 credits if content differs. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the special education department (or developed cooperatively with other departments, colleges and universities) and not otherwise covered in the present course listing. Laboratories, and special education centers: institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.
EDUC — Education

EDUC 388 Special Topics in Education (1-3) Prerequisite: permission of department. Repeatable to 6 credits if content differs.

EDUC 498 Selected Topics in Education (1-3) Prerequisite: permission of college. Repeatable to 9 credits if content differs. Current topics and issues in education.

EDUC 499 Honors Thesis (1-6) Prerequisites: admission to College Honors Program and permission of college. Individual thesis work under supervision of faculty advisors; includes periodic formal meetings with other honors students engaged in thesis work.

ENAE — Engineering, Aerospace

ENAE 100 The Aerospace Engineering Profession (1) Requisites: ENME 110 and MATH 140. Overview of the various aspects of professional practice of aerospace engineering, introduction to the range of technical expertise needed to succeed in the profession and the objectives of the various parts of the aerospace engineering program at UMCP in supporting students’ efforts in gaining the required knowledge and skills. Familiarization with departmental faculty and their areas of research, creation of links with other students, professional society student chapters, and available resources. Discussion of ethical issues, business requirements, and their interaction with technological requirements.

ENAE 202 Aerospace Computing (2) Also offered as ENCE 202. Introduction to basic computational tools for the solution of engineering problems. FORTRAN programming including programs for solution of sets of linear or non-linear equations, solution of systems of ordinary differential equations, solution of single variable functions, and subroutines. Computational/symbolic processing packages are introduced in the context of engineering analysis.

ENAE 261 Aerospace Analysis and Computation (3) Prerequisites: MATH 240; ENES 202, ENES 100, and PHYS 161. Corequisites: ENAE 241. ENAE majors only or permission of department. Introduction to linear algebra, vector spaces, matrices, eigenvectors and eigenvalues, interpolation and probability distributions, deterministic and stochastic systems, estimation theory, applications to aerospace engineering problems.


ENAE 301 Dynamics of Aerospace Systems (3) Prerequisites: ENAE 283; ENES 202; ENES 221; PHYS 246; and PHYS 263. Corequisites: ENAE 321. ENAE majors only or permission of department. Kinematics and dynamics of three dimension motion of rigid and flexible bodies with emphasis on more general systems. Study of Newtonian methods with introduction to Lagrange’s equations and Hamilton’s principle. Practice in numerical solutions of equations of motion using MATLAB or similar high level computer mathematics systems.


ENAE 324 Aerospace Structures (4) Prerequisite: ENES 220. For ENAE majors only. Introduction to the fundamentals of solid mechanics. Following: ENAE 322 or ENAE 324. Formerly ENAE 322. Analysis of torsion, beam bending, plate bending, buckling and their application to aerospace.

ENAE 362 Aerospace Instrumentation and Experimentation (3) Two lecture and three hours of laboratory per week. Prerequisites: grades of C or better in PHYS 263, ENAE 261, ENAE 281, ENAE 282, ENES 221, and MATH 246. Co-requisites: ENAE 321, and ENAE 322. EnAE majors only. Description of fundamental measuring techniques to measurements in aerospace engineering. Includes metrology, machine tool measurements, bridge circuits, optical devices, computer based data acquisition. Topics chosen to be relevant to developments in aerospace, flight structures, and flight control.

ENAE 388Aerospace Engineering Laboratory (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: ENAE 100 and ENAE 110. Formerly ENAE 331. ENAE majors only or permission of department. Application of fundamental elements and measurements in aerospace engineering. Includes experiments in aerodynamics, structures, propulsion, flight dynamics and astrodynamics. Correlation of theory with experimental results.

ENAE 411Altitude Control (3) Prerequisite: ENAE 311 and ENAE 432. ENAE majors only or permission of department. Serves as an introduction to flight testing and design of aircraft. Specific emphasis will be placed on single engine general aviation type aircraft.

ENAE 417 Control of Aerospace Systems (3) Prerequisites: ENAE 321; 322; and ENAE 362; and ENAE 414. ENAE majors only or permission of department. Aircraft design principles blending both synthesis and analysis. The iterative nature of the design process. Applied aerodynamics. Elements of aircraft performance calculation and optimization. Design of aircraft including payload, crew and avionics provisions, propulsion selection and sizing, aerodynamic configuration optimization, mass properties, stability and control characteristics, and vehicle subsystems. Individual student projects in aircraft design.

ENAE 426Aerospace Systems Design (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: ENAE 100 and ENAE 414. ENAE majors only or permission of department. Principles of space systems analysis and vehicle design. Launch vehicle performance analysis and optimization. Design of space systems including mission design, life support, human factors, structures, actuator and mechanisms, and thermal control. Design processes and design synthesis. Individual student projects in vehicle design.

ENAE 441 Space Navigation and Guidance (3) Prerequisites: ENAE 311 and ENAE 432. ENAE majors only or permission of department. Formerly ENAE 441. EnAE majors only or permission of department. Principles of space systems analysis and vehicle design. Launch vehicle performance analysis and optimization. Design of space systems including mission design, life support, human factors, structures, actuator and mechanisms, and thermal control. Design processes and design synthesis. Individual student projects in vehicle design.

ENAE 484 Space Systems Design (3) Three hours of lecture and six hours of discussion/recitation per week. Prerequisites: ENAE 423; ENAE 441; ENAE 457; ENAE 483. ENAE majors only. Senior capstone design course in the space track. Group preliminary design of a space system, including system and subsystem design, configuration control, costing, risk analysis, and programmatic development. Course also emphasizes written and oral engineering communication. Topics of design and student experiences. Groups of students will complete, brief and report on a major design study to specific requirements.

ENBE — Biological Resources Engineering

ENBE 100 Basic Biological Resources Engineering Technology (3) For non-engineering majors. Formerly ENAG 100. An introduction to the applications of engineering concepts to biology, agriculture, and environment. Topics include quantification measurements, mechanical, thermal, fluid, and electrical principles.

ENBE 110 Introduction to Biological Resources Engineering (1) One hour of lecture and one hour of laboratory per week. Biological engineering applications, including aquaculture, bioinstrumentation, biomedicine, biotechnology, environment, biomass, food, and plant growth. Simple laboratory experiments will illustrate important techniques used by biological engineers.

ENBE 200 Fundamentals of Agricultural Mechanics (3) Two hours of lecture and four hours of laboratory per week. Formerly ENAE 200. Study of hand tools and power shop equipment as they relate to agricultural applications. Simple tools, soil mixing, plumbing, wood and metal working, welding, brazing, soldering, hot and cold sheet metal, electricity, construction and building materials, sketching, drafting, and basic construction. Emphasis is upon the development of orderly and safe shop practices.

ENBE 234 Principles of Erosion and Water Control (1) Introduction to the concepts of erosion and water control, including land planning, soil erosion, and sedimentation principles necessary to control erosion and runoff from agricultural areas. For non-engineering students.


ENBE 237 Design of Irrigation Systems (1) Principles and practices of the design, operation, and management of irrigation systems, including types of irrigation systems, soil water concepts, evapotranspiration, irrigation scheduling and design of a sprinkler irrigation system. For non-engineering students.

ENBE 241 Computer Use in Bioresource Engineering (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: permission of department. Introduction to computer technologies in biological and natural resource systems considering engineering aspects. Designed to help students in the use of computer technology for problem solving. The course will cover 4.5 software packages important for later use by the student.

ENBE 305 Farm Mechanics (2) For agricultural education majors only. Senior standing. Formerly ENAG 305. Two laboratory periods a week This course consists of laboratory exercises in farm equipment, help farm equipment maintenance, repair, and construction projects, and a study of the principles of shop organization and administration.

ENBE 315 Energy: Its Effects on Agriculture and Food (3) Formerly ENAG 315. Introduction to the current energy problems related to agriculture and food supply. Energy issues, alternate sources of energy, energy conservation practices, possible solutions and limitations.

ENBE 388 Honors Thesis Research (3-6) Prerequisite: Admission to AGNR or ENGR Honors Program. Repeatable to 6 credits. Undergraduate honors research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of Agricultural and Home Economics. The thesis will be defended to a faculty committee.

ENBE 414 Mechatronics (4) Prerequisite: PHYS 121, Formerly ENAG 414. Three lectures and one laboratory per week. Applications in the processing and preservation of foods, power transmission, hydraulics, electricity, thermodynamics, refrigeration, instruments and controls, materials handling and time and motion analysis.


ENBE 422 Water Resources Engineering (3) Prerequisite: ENBE 250, permission of department, Formerly ENAG 422. Applications of engineering and soil sciences in erosion control, drainage, irrigation and watershed management. Principles of agricultural hydraulics and design of water control and conveyance systems.

ENBE 435 Aquacultural Engineering (3) Prerequisite: Algebra. Ability to read and interpret graphical material and one semester each of college physics and college chemistry; and permission of department. Formerly ENAG 435. The course will explore the natural aquatic environment and how aquatic organisms are affected by this environment. The course will then explore various ecosystems, including freshwater, marine, and recirculating systems, and will explore ways to increase production of fish with less water usage. Components of recirculating aquaculture systems will be covered.

ENBE 451 Water Quality: Field and Lab Analysis Methods (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: ENBE 241, ENSH 104, and CHEM 131. Also offered as NRMT 451. Credit will be granted for only one of the following: ENBE 451 or NRMT 451. Hands-on experience with techniques of sample collection, chemical, and biological characteristics of surface waters, including streams, lakes, and wetlands. Emphasis is placed on understanding effects of water quality on ecological function and function.

ENBE 453 Introduction to Biological Materials (3) Prerequisite: ENBE 241. Understanding the properties of biological materials, including animal tissues and agricultural products, and of traditional engineering materials such as metals, ceramics, alloys, and polymers. Course includes limited laboratory experiences.

ENBE 454 Biological Process Engineering (4) Prerequisites: MATH 147, ENES 220, one course in oceanography, life sciences, or permission of department. Formerly ENAG 454. Fluid flow, heat transfer, and mass transfer with applications to agriculture, biotechnology, food, agriculture, and other biosystems. Design of solutions to current problems in biological engineering is emphasized.

ENBE 455 Basic Electronic Design (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: PHYS 142 or equivalent, MATH 246, and ENBE 241. Familiarization with basic electronic circuits and the ability to produce simple electronic designs.

ENBE 456 Biomedical Instrumentation (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: PHYS 142 or equivalent, MATH 246, and ENBE 241. Familiarization with basic electronic circuits and the ability to produce simple electronic designs.

ENBE 462 Nonpoint Source Pollution Assessment Techniques (3) Prerequisite: one course in hydrology or permission of department. Various techniques to identify and measure non-point source pollution. Primary focus is on agriculture and water.

ENBE 471 Biophysical Systems Control (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: ENBE 455, one course in biological sciences or permission of department. Principles of control systems designed by biological engineers and analog of control systems found in biological organisms. Apparent control strategies used by biological systems will be covered.

ENBE 481 Creative Design with CAD/CAM (3) Two hours of lecture and one hour of laboratory per week. Formerly ENAG 481. Computer aided design (CAD) techniques applicable to a wide range of engineering applications.

ENBE 482 Dynamics of Biological Systems (1) Prerequisite: ENBE 454 or equivalent. Force-acceleration, work energy, and impulse-momentum relationships important for biological systems and whole-body organisms.

ENBE 484 Biosystems Responses to Environmental Stumil (3) Two hours of lecture and one hour of laboratory per week. Prerequisite: ENBE 454 or permission of department. Description of responses of systems to external stimuli, including temperature, water, atmosphere, light, chemicals, social interactions, and others. Mathematical models and engineering concepts applied to living systems. Useful to be able to analyze biological systems and design products and processes dealing with or intended for biological systems or organisms.

ENBE 485 Capstone Design I (1) One hour of lecture per week. Prerequisite: ENBE 451, ENBE 455, and permission of department. Senior standing. For ENBE majors only. To complete the curriculum of an undergraduate engineer, design procedures and professional design project will be presented. Students will begin planning and designing their capstone projects. CORE capstone core for ENBE 485 and ENBE 486. Students may be enrolled in ENBE 486 but not in ENBE 485.

ENBE 486 Capstone Design II (2) Two hours of lecture per week. Prerequisite: ENBE 485 taken in the immediately preceding semester. Senior standing. For ENBE majors only. To complete the curriculum of an undergraduate engineer, design procedures and professional design project will be presented. Students will begin planning and designing their capstone projects. CORE capstone core for ENBE 485 and ENBE 486. Will not be awarded until satisfactory completion of ENBE 486.

ENBE 488 Special Topics in Biological Engineering (1-4) Prerequisite: permission of department. Lecture and laboratory exercises designed to extend students' understanding of biological research engineering. Current topics are emphasized.

ENBE 489 Special Problems in Biological Engineering (1-3) Prerequisite: permission of department. Student will select an engineering problem which may include design, experimentation, and/or data analysis.

ENBE 499 Special Problems in Agricultural Engineering Technology (1-3) Prerequisite: permission of department. Formerly ENAG 499. Not acceptable for majors in agricultural engineering. Problems assigned in proportion to credit.

ENCE — Engineering, Civil

ENCE 202 Computation Methods in Civil Engineering I (3) Prerequisites: MATH 141, ENES 102, and ENES 100. For ENCE majors only. For ENCE minors. Primer in the introduction to basic computational tools for the solution of engineering problems. Spreadsheet and computational symbolic processing packages are introduced in the context of engineering economic problems. Introduction to event-driven structured programming.

ENCE 203 Computation Methods in Civil Engineering II (3) Prerequisites: MATH 241 and ENES 220. Course: MATLAB. For ENCE majors only. Formerly ENCE 301. Elementary numerical analysis: roots of equations, systems of linear algebraic equations, curve fitting, integration, and solution of ordinary differential equations. Numerical techniques are presented in the context of solving engineering problems, and example problems are solved using a variety of computer-based tools (structure programming, spreadsheet, and computational symbolic processing software packages).

ENCE 300 Fundamentals of Engineering Materials (3) Two hours of lecture per week. Prerequisites: PHYS 201 or co-prerequisite: ENES 220. Properties and constitution of the principal materials used in civil engineering. Laboratory project management and to develop analytical skills necessary on the management side of engineering projects. Topics include economic analysis, project screening and selection, organizational and project structure, scheduling, budgeting, resource management, life cycle costing, and project control.

ENCE 330 Basic Fluid Mechanics (3) Prerequisites: ENES 220; ENES 221; and PHYS 262. The study of fluids at rest and in motion. Principles of viscous and turbulent flow. Impulse and momentum concepts. Pressure in gases and meters. Dimensional analysis and laws of similarity.


ENCE 353 Introduction to Structural Analysis (3) Prerequisite: ENES 220. Corequisite: ENCE 203. For ENCE majors (09880) only. Credit will be granted for only one of the following: ENCE 203 or ENCE 353. Formerly ENCE 353. The study of statically determinate and indeterminate structures for fixed and moving loads. Equations of equilibrium and compatibility, load cases, shear and moment diagrams, stress analysis, design of buildings, and structures. Analysis of forces and deflections in structures by methods of moment distribution, consistent deformation, and virtual work.

ENCE 355 Introduction to Structural Design (3) Prerequisite: ENCE 300. For ENCE majors only. Structural design of members for buildings and bridges, including simple frames, compression and shear and bending. Materials: structural steel and reinforced concrete. Design of welded and bolted connections. Placement of reinforcing bars in concrete members.

ENCE 370 Fundamentals of Transportation Engineering (3) Prerequisites: MATH 141 and PHYS 262. Engineering problems of transportation by highways, airways, pipelines, railways, and waterways. Development of traffic and functional consideration of routes and terminals.

ENCE 398 Honors Research Project (1-3)


ENCE 420 Construction Equipment and Methods (3) Prerequisite: ENCE 320. Senior standing. For ENCE majors only. Design and selection of construction equipment and tools, including earthmoving, paving, steel and concrete construction, formwork, trenching, cofferdams, rock excavation, tunneling, site preparation and organization.

Approved Courses 185
ENCE 423 Project Estimating, Planning and Control (3) Two hours of lecture, four hours of laboratory per week. Prerequisite: ENCE 320. For ENCE majors only. Application of planning and scheduling techniques for construction work: introduction to resource leveling and time-cost tradeoffs, cost estimating, cost indices, parametric estimates, unit price estimates.


ENCE 430 Flow in Open Channels and Conveyance Structures (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: ENCE 340. For ENCE majors only. Application of theoretical, experimental and computer simulation techniques in the design of open channels and conveyance structures including velocity profiles, flow deflections, flow resistance, flow energy, entrapped air, and nonuniform flow. Streamlined and supercritical flow solutions. Open channels with two dimensional flow, including transition, spillways, culverts, wiers, and bridge design. Methods of hydraulic analysis and design for open channels and conduits.

ENCE 455 Design of Steel Structures (3) Prerequisites: ENCE 335 and CHEM 233. Behavior and design of members subjected to fatigue, combined bending and compression; plate girders, composite beams, and composite slabs; design of dependable service loads, flange failure and design, and load and resistance factor design elements. Factors of plastic analysis and design. Framing systems and loads for industrial buildings and bridges.

ENCE 463 Engineering Economics and Systems Analysis (3) Three hours of lecture. Prerequisites: ENCE 202 and ENCE 203. For ENCE majors only. Development and application of engineering economic principles to engineering problems. Evaluations of design alternatives. Deterministic modeling and optimization with emphasis in civil engineering applications simulation modeling.

ENCE 465 Geographic Information Systems for Planning and Design Models (3) Prerequisites: ENCE 202 and ENCE 203. For ENCE majors only. Application of geographic information systems and image processing software on personal computers.

ENCE 470 Highway and Traffic Engineering (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: ENCE 320 and ENCE 330. For ENCE majors only. Transportation and traffic characteristics. Thought processes and planning. Traffic flow theory and traffic operations and management.

ENCE 471 Urban Transportation Planning (3) Prerequisite: ENCE 370. For ENCE majors only. Introduction to urban transportation modeling systems. Transportation demand analysis. Algorithm development and traffic assignment. Transportation alternative evaluations.

ENCE 472 Transportation Engineering (3) Prerequisite: ENCE 370. For ENCE majors only. Transportation engineering concepts including transportation systems analysis, airport systems, water transportation, and mass transportation operations.

ENCE 488 Senior Thesis (3) Senior standing. For ENCE majors only. Advanced study in civil engineering problems with special emphasis on mathematical modeling and experimental methods.

ENCE 498 Special Problems in Civil Engineering (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisite: ENCH 424; and ENCH 440. Co-requisite: ENCH 446. Application of chemical engineering principles to the design of chemical processing equipment. Data from experimental observations are used to evaluate performance and efficiency of operations. Emphasis on correct presentation of results in report form.

ENCE 499 Process Engineering Economics and Design I (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisites: ENCH 300; ENCH 422; and CHEM 481. Fundamentals of chemical reaction kinetics and their application to the design and operation of chemical reactors. Reaction rate theory, homogeneous reactions and catalysis, electrochemical reactions. Catalytic reactor design.

ENCE 500 Chemical Process Thermodynamics (3) Three hours of lecture and one hour of laboratory per week. Prerequisites: CHEM 243; and ENCH 215 and ENCH 250. Pre- or co-requisite: MATH 241. Principles of thermodynamics and their applications to design problems. First and second laws of thermodynamics, properties of gases, liquids and solids, phase equilibrium, flow and non-flow systems, energy conversion, first law of thermodynamics, analysis of processes, equilibrium stage operations and the thermodynamics of chemically reacting systems.

ENCE 533 Chemical Engineering Seminar (1) Junior standing. Oral and written reports on recent developments in chemical engineering and the process industries.

ENCE 542 Transport Processes I (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisites: ENCH 215 and ENCH 250. Pre- or co-requisite: MATH 241 and MATH 246. Macroscopic approach to analysis of heat, mass and momentum transfer. Integration of first energy equation, Bernoulli’s equation. Intermediate application to design of process equipment. Radiant heat transfer.

ENCE 542 Transport Processes II (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisites: ENCH 300 and ENCH 422. Microscopic approach to analysis of heat, mass and momentum transfer Analogies, laws for conduction and convection. Design applications via differential equations and empirical correlations. Equilibrium and boundary layer problems. Turbulent flow theory.
ENEE 214 Numerical Techniques in Engineering (3) Three hour course required for all ECE seniors prior to senior year. Prerequisite: MATH 141; and ENEE 114 or CMSC 106 or equivalent.) Restricted to Engineering, Math and Physics majors only. Offered for MATH 242 Credit will be granted for only one of the following: ENEE 214 or ENEE241 or MATH 242. Formerly ENEE 214. Introduction to error analysis, conditioning and computational solution of nonlinear equations. Vector spaces and linear transformations. Matrix algebra. Gaussian elimination. LU factorization, matrix rank, similarity transformations and diagonalization. Iterative computational techniques. Interpolation; splines; data fitting. Numerical integration.

ENEE 244 Digital Logic Design (3) Three hours of lecture and one hour of discussion recitation per week. Prerequisite: ENEE 114 or CMSC 106. Formerly ENEE 244. Elements of logic design. AC steady state analysis. Phasors, node and mesh analysis, transformers; their I-V relationships. Kirchoff’s Laws. DC and AC steady state network analysis. Basic circuit elements: resistors, capacitors, inductors, operational amplifiers and digital integrated circuits. Circuit simulation with SPICE. Same as ENEE 244. Four hour course. Prerequisite: ENEE 244. Credit will be granted for only one of the following: ENEE 244 or ENEE 302.

ENEE 302 Digital Electronics (3) Prerequisite: ENEE 244 and completion of all lower-division courses in the EE curriculum. Restricted to students with 09090 or 09991 major codes. See above note. Large signal terminal characteristics of PN junction diodes, bipolar and MOSFET transistors. Digital electronics at transistor level: inverter, NAND, NOR AND, OR, gates, CMOS. Continuous time and sequential digital circuits, memory design. Circuit simulation with SPICE.

ENEE 306 Electronic Circuits Design Laboratory (2) One hour of lecture and three hours of laboratory per week. Prerequisite: ENEE 302. For ENEE majors 09991 only. Not open to students who have completed ENEE 302 if taken Fall 1998. Credit will be granted for only one of the following: ENEE 306 or ENEE 301. Transfer students will be allowed one term to complete all such courses after starting to take upper-level ENEE courses.

ENEE 307 Microwave Circuits Laboratory (2) One hour of lecture and three hours of laboratory per week. Prerequisite: ENEE 302 and completion of all lower-division technical courses in the EE curriculum. Restricted to students with 09090 major code. Experiments concerned with circuits constructed from microwave components providing practical opportunity in the design, construction and testing of such circuits. Projects include microwave filters and S-parameter design with applications of current technology.

ENEE 416 Integrated Circuit Fabrication Laboratory (3) One hour of lecture and three hours of laboratory per week. Prerequisite: ENEE 302. Formerly ENEE 413. Students will be introduced to all lower-division technical courses in the EE curriculum. For 09091 majors only. Not open to students who have completed ENEE 413. Formal ENEE 412 is recommended for students planning on constructing NMOS transistor circuits. The transistor characteristics will be measured and related to the fabrication parameters.

ENEE 417 Microelectronics Design Laboratory (2) One hour of lecture and three hours of laboratory per week. Prerequisite: ENEE 306 and ENEE 312 and completion of all lower-division technical courses in the curriculum. For ENEE majors only. Senior capstone project laboratory, where student design and build fairly sophisticated circuits, mainly constructed of discrete transistors and integrated circuits. Many of the projects are designed to require that students synthesize from what they have learned in many of the disciplines in electrical engineering. Students learn they can actually use their knowledge to build something very practical, which may include a high-fidelity amplifier, a radio, a memory cell, a transmitter, etc.

ENEE 418 Topics in Microelectronics (1-3) Prerequisite: ENEE 307. Frequency domain analysis and Fourier transforms used to analyze linear systems with stochastic inputs. Students will choose one of a number of topics in probability and stochastic processes and present a project. These topics will be selected topics of current interest in microelectronics.

ENEE 420 Communication Systems (3) Prerequisite: ENEE 302 and completion of all lower-division technical courses in the EE curriculum. Same as ENEE 420. See above note. Credit will be granted for only one of the following: ENEE 302 or ENEE 420. Credit will be awarded for only one of the following: ENEE 420 or ENEE 302. Formerly ENEE 420. Structure and organization of digital communication systems; analysis of communication systems; multi-carrier systems. Communication systems such as microwave, satellite, and optical fiber systems will be analyzed. This course differs from ENEE 302 in that surveys a broad variety of areas rather than focusing on a single area.

ENEE 425 Digital Signal Processing (3) Prerequisite: ENEE 302 and completion of all lower-division technical courses in the EE curriculum. Same as ENEE 425. See above note. Sampling as a modulation process; aliasing; the sampling theorem; the z-transform and the Fourier transform; digital filters. Design of recursive and nonrecursive digital filters; the Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT); digital filtering using the FFT; analog-to-digital and digital-to-analog conversion; the Nyquist sampling theorem and its applications; finite-precision arithmetic.

ENEE 474 Digital and Communication Networks (3) Prerequisite: ENEE 302 and completion of all lower-division technical courses in the EE curriculum. Credit will be awarded for only one of the following: ENEE 474 or ENEE 302. Formerly ENEE 474. Communication theory for digital and analog transmission systems. Internet, local area networks, telephone network. Introduction to signal processing and network theorems. Error correcting codes. Optimal and suboptimal detection. Introduction to digital voice communication. Introduction to queueing theory to design problems in such networks. Review of proposed architectures and protocols.
ENEE 428 Communications Design Laboratory (2) One hour of lecture and three hours of laboratory per week. Prerequisites: ENEE 204 and ENEE 350; and completion of all lower-division technical courses in the EE curriculum. See above note. Co-requisite: ENEE 425. For ENEE majors only. Corequisite: ENEE 425. Designing and analyzing communication systems by implementing them on actual DSP based hardware in real time.

ENEE 429 Topics in Communications (1-3) Prerequisite: permission of department and completion of all lower-division technical courses in the EE curriculum. See above note. Corequisite: ENEE 425. ENEE 350. For ENEE majors only. Selected topics of current importance in communications.

ENEE 434 Introduction to Neural Networks and Signals (3) Prerequisites: completion of all lower-division technical courses in the EE curriculum. See above note. Introduction to the generation and processing of bio-electric signals including structure and function of the neuron, membrane theory, generation and propagation of nerve impulses, synaptic mechanisms, transduction and neural coding of sensory events, central nervous system processing of sensory information and correlated electrical signals, control of effector organs, muscle contraction and mechanics, and models of neurons and neural networks.


ENEE 439 Topics in Signal Processing (1-3) Prerequisite: permission of department and completion of all lower division technical courses in the EE curriculum. Repeatable to any number of credits if content differs. For 09991 majors only. Selected topics of current importance in signal processing.

ENEE 440 Microprocessors (3) Prerequisite: ENEE 350 and completion of all lower-division technical courses in the EE curriculum. See above note. Microprocessor architecture, instruction sets, and applications. Bus structures, memory, I/O interfacing. Assembly language, machine code, and the microcontroller in systems. ANSI C compiler configuration, and the embedding of microprocessors in systems.

ENEE 441 Digital VLSI System Design Laboratory (3) One hour of lecture and three hours of laboratory per week. Prerequisites: ENEE 312, ENEE 350, and permission of instructor. Introduction to the completion of all lower-division technical courses in the EE curriculum. For 09990 and 09991 majors only. Topics for seniors who have completed ENEE 459Y. Formerly ENEE 459Y. This course is designed to enhance the student's understanding of control feedback systems and to familiarize him with the characteristics and limitations of real control devices. Students will design, build, test and servomechanisms, and will conduct analog and hybrid computer simulations of control systems.

ENEE 462 Systems, Control and Computation (3) Prerequisite: ENEE 350 and completion of all lower-division technical courses in the EE curriculum. See above note. Matrices, algebraic algorithms, analysis of discrete and continuous systems, state space analysis of linear systems, system analysis by the Laplace transform, and computer simulations of control systems.

ENEE 463 Digital Control Systems (3) Prerequisites: ENEE 322 and completion of all lower-division technical courses in the EE curriculum. For 09990 and 09991 majors only. Not open to students who have completed ENEE 469Y. Formerly ENEE 469Y. Introduction to techniques for the analysis and design of linear control systems and implementation of control systems using computer programs that solve fundamental equations, state equations, and transfer functions. Design of control systems. Students will use MATLAB for the solution of problems and the design of control systems.

ENEE 468 Design and Control of a Walking Robot (3) One hour of lecture and two hours of discussion/recitation per week. Prerequisite: ENEE 322. Junior standing. For ENEE, ENME, and CHSS majors only. Repeatable to 6 credits if content differs. Also offered as ENEE 489. ENEE capstone design course. Design by students of a fully functional walking robot. Students will learn concepts of mechanics, dynamics, digital and logic design, and software development.

ENEE 469 Topics in Control (1-3) Prerequisites: permission of department and completion of all lower-division technical courses in the EE curriculum. Repeatable to any number of credits if content differs. For 09990 and 09991 majors only. Selected topics of current importance in controls.

ENEE 472 Electric Machines and Actuators (3) Prerequisite: ENEE 322; and ENEE 380; and completion of all lower-division technical courses in the EE curriculum. See above note. Linear and nonlinear magnetic circuits, hysteresis and eddy current losses, transformers, induction motors, synchronous generators.

ENEE 473 Electrical Machines Laboratory (2) One hour of lecture and three hours of laboratory per week. Prerequisite: ENEE 206 and completion of all lower-division technical courses in the EE curriculum. Formerly ENEE 473. For 09990 major code. See above note. Experiments involving single and three phase transformers, induction machines, synchronous machines and D.C. machines.

ENEE 474 Power Systems (3) Prerequisite: ENEE 322 and completion of all lower-division technical courses in the EE curriculum. See above note. Interconnected power systems, transmission lines, load flow studies, unit commitment and economic dispatch. Three phase networks, machine models. Symmetrical components, fault analysis and unbalanced operation. Power system transients, stability and numerical methods in power system analysis.

ENEE 475 Power Electronics (3) Prerequisite: ENEE 302 and completion of all lower-division technical courses in the EE curriculum. See above note. For ENEE majors only. This course is suitable for undergraduate and graduate students who want to learn the basic principles of power electronics and its applications. Special emphasis is placed on interdisciplinary nature of power electronics. Strong and intimate connections between power electronics and circuit theory, electronic circuits, semiconductor devices, electronic power, magnetic, motor drives and control are stressed.


ENEE 480 Fundamentals of Solid State Electronics (3) Prerequisite: ENEE 302 and completion of all lower-division technical courses in the EE curriculum. See above note. Crystal structure and materials preparation; carrier transport; elementary quantum mechanics applied to solids; band structure, metals, insulators; field effect transistors; PN junctions; bipolar transistors; fabrication of devices.

ENEE 481 Antennas (3) Prerequisite: ENEE 381 and completion of all lower-division technical courses in the EE curriculum. See above note. Selected topics in the design of passive and active microwave devices. Microwave circuit theory. Transmission lines, load flow studies, unit commitment and economic dispatch. Three phase networks, machine models. Symmetrical components, fault analysis and unbalanced operation. Power system transients, stability and numerical methods in power system analysis.

ENEE 482 Design of Active and Passive Microwave Devices (3) Prerequisite: ENEE 381 and completion of all lower-division technical courses in the EE curriculum. See above note. Design and operation of passive and active microwave devices. The passive components include wave-guides, resonators, and antennas. The active devices include klystrons, magnetrons, gyrotrons, and free electron lasers.

ENEE 484 Design of Charged Particle Devices (3) Prerequisite: ENEE 381 and completion of all lower-division technical courses in the EE curriculum. See above note. Selected topics in the design of charged particle devices such as electron and ion sources, electric and magnetic lenses, high power microwave tubes, and particle accelerators.

ENEE 485 Loudspeaker Design (3) One hour of lecture and three hours of laboratory per week. Prerequisites: ENEE 204 and ENEE 206 and completion of all lower-division technical courses in the EE curriculum. Restricted to students with a 09990 major code. See above note. Only ENEE majors. This course will deal with the design concepts of a variety of charged particle devices such as electron and ion sources, electric and magnetic lenses, high power microwave tubes, and particle accelerators.

ENEE 487 Microprocessor Systems Design (3) Prerequisites: ENEE 350, experience in C or C++, and familiarity with UNIX, and completion of all lower-division technical courses in the EE curriculum. For 09990 and 09991 majors only. Not open to students who have completed ENEE 459. Students must complete ENEE 459. Formerly ENEE 459. Introduction to the design, programming, and implementation of computer systems. Through classroom lectures, homework, and projects, students learn the structures of concurrency, and process management, inter-process communication and synchronization, job scheduling algorithms, memory management, file systems, and protection and security in operating systems. Optional topics may include communications protocols, computer security, and real-time operating systems.

ENEE 488 Microprocessor Systems Design (3) Prerequisites: ENEE 459, experience in C or C++. Corequisite: ENEE 459. For ENEE majors only. Experience in C or C++ language, computer systems design, implementation and analysis of computer operating systems. Through classroom lectures, homework, and projects, students learn the structures of concurrency, and process management, inter-process communication and synchronization, job scheduling algorithms, memory management, file systems, and protection and security in operating systems. Optional topics may include communications protocols, computer security, and real-time operating systems.
ENES 486 Optoelectronics Lab (2) One hour of lecture and three hours of laboratory per week. Prerequisite: Engineering majors only. MATH 246 and PHYS 263 and completion of all lower-division technical courses in the EE curriculum. Restricted to students with a 09090 major code only. Open to students in different areas of expertise. Note: This material is given in lab.

ENES 493 Introduction to VLSI Design (3) Prerequisites: ENES 312 and completion of all lower-division technical courses in the EE curriculum. See above note. For 09090 majors only. ENEE 488. Selected topics of current importance in electrical engineering.

ENES 499 Senior Projects in Electrical Engineering (1-3) Hours to be arranged. Prerequisites: permission of instructor and department and completion of all lower-division technical courses in the EE curriculum. See above note. Repeatable to any number of credits if content differs. For 09090 majors only. Formerly ENEE 488. Selected topics of current importance in electrical engineering.

ENES — Engineering Science

ENES 100 Introduction to Engineering Design (3) One hour of lecture, two hours of laboratory, and two hours of discussion/recitation per week. Corequisite: MATH 141. Students work as teams to design and build a product using computer software for word-processing, spreadsheets, CAD, and communication skills.

ENES 102 Statics (3) One hour of lecture and two hours of discussion/recitation per week. Prerequisite: ENES 100 or permission of department. Three hours of lecture and two hours of laboratory per week. Prerequisites: ENES 102 or ENES 110; and MATH 141; and PHYS 161. Systems of heavy particles and rigid bodies at rest and in motion. Force- acceleration, work-energy and impulse-momentum relationships. Motion of one body relative to another in a plane and in space.

ENES 220 Mechanics of Materials (3) Prerequisites: ENES 102; and MATH 246 and PHYS 263 and ENES 221. Basic principles of mechanics of materials and the behavior of materials used in engineering and business students to the principles of total quality, using experiential team learning and technology aided projects. The first of four courses in total quality.

ENES 222 Dynamics (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: ENES 102 or ENES 110; and MATH 141; and PHYS 161. Systems of heavy particles and rigid bodies at rest and in motion. Force- acceleration, work-energy and impulse-momentum relationships. Motion of one body relative to another in a plane and in space.

ENES 230 Introduction to Materials and Their Applications (3) Prerequisites: ENES 100 or permission of department. Structure of materials, chemical composition, phase transformations, properties of a fluid and solid bodies, metals, semiconductors, ceramics, polymers and related materials. Materials selection in engineering applications.

ENES 240 Engineering Computation (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: MATH 141. Introduction to the design and implementation of algorithms to solve engineering problems using digital computers. Analysis of problems formalization, algorithm development, computer-aided program development and diagrammatic description of effective procedures for solving them and implementing and testing of these solutions in a common high-level engineering oriented language such as FORTRAN. Techniques for data input and storage, selection of relevant numerical and non-numerical methods for problem solutions, and the efficient ordering of data for meaningful output presentation.

ENES 380 Methods for Measuring Quality (3) Prerequisite: BMGT 190 or ENES 190. Expose engineering and business students to the need and use of measurement techniques that lead to continuous improvement. The second course of four courses in total quality.

ENES 388 Engineering Honors Seminar (1) ENES 389 Selected Topics (3) Repeatable to 6 credits if content differs.

ENES 390 Competing on Quality in a Global Economy (3) Prerequisite: BMGT 290 or ENES 389. Also offered as BMGT 290. Provides engineering and business students with an understanding of the need and use of measurement techniques that lead to continuous improvement. The second course of four courses in total quality.

ENES 405 Power and the Environment (3) Prerequisite: ENES 100 or permission of department. The environmental impact of energy production and use. The nature and need of measurement techniques that lead to continuous improvement. The third of four courses in total quality.

ENES 410 Product Liability and Regulation (3) Hours of lecture per week. Prerequisite: permission of department. How to get involved, What the corporate sector expects from a new engineering graduate.

ENES 411 Fire Risk Assessment (3) Prerequisites: ENMP 251; and ENMP 255. Analysis of fire safety in engineering applications. Application of systems analysis, probability theory, engineering economics, risk management and protection, and design of fire protection systems. For non-ENFP majors only. Experimental evaluation of ignition, flame spread, rate of heat release and smoke production of furnishings and interior materials.

ENES 420 Fire Protection Systems Design (3) Recommended: ENMP 300. Study of gaseous and particulate fire suppression systems. Examination and evaluation of code criteria, performance specifications and research. Application of fluid dynamics to the design process and the calculation procedures for gaseous particulate fire suppression systems. An integrated fire protection systems design project. Functional analysis and design of detection systems.

ENES 435 Product Liability and Regulation (3) Prerequisites: MATH 246 and PHYS 262 and ENES 221. Basic principles of systems analysis, probability theory, engineering economics and fire detection system design. Application of fluid dynamics to the design process and the calculation procedures for gaseous particulate fire suppression systems. For non-ENFP majors only. Experimental evaluation of ignition, flame spread, rate of heat release and smoke production of furnishings and interior materials.

ENES 440 Solution of Systems of Equations Using Digital Computers (3) Prerequisites: MATH 141, MATH 246, and PHYS 263. Study of numerical methods and computer algorithms for solving systems of linear equations. Application of computer software for word-processing, spreadsheet, CAD, and communication skills.

ENES 480 The Future of Engineering and Engineering Education, Basic Technological Literacy, Business and Entrepreneurship Issues for Engineers, the Joy of Discovery, Student Projects: How to get involved, Research and Development Programs: How to get involved, What the corporate sector expects from a new engineering graduate.

ENES 490 The Total Quality Practicum (3) Prerequisites: BMGT 390 or ENES 390. Also offered as BMGT 490. Capstone course for the four course total quality program. Based on a major project undertaken by student teams in an industry environment. Integration of the techniques and approaches that each project will be supervised by a joint faculty-industry team with differing areas of expertise.

ENES 508 Engineering Professional Development for Teachers (3) Prerequisites: ENES 390 and ENES 390. Focuses on the role of the engineering education professional in the engineering education system. An introduction to the fundamental concepts that drive the education of engineers. An introduction to the educational administration, leadership and management concepts involved, what the corporate sector expects from a new engineering graduate.

ENFP — Engineering, Fire Protection

ENFP 251 Introduction to Fire Protection Engineering (3) The social, economic, environmental and legal dimensions of the fire problem. The theoretical and engineering principles of basic fire phenomena. Technological assessment of urban fire protection utilizing operations research and systems engineering procedures.

ENFP 255 Fire Alarm and Special Hazards Design (3) Formerly ENFP 315. Study of gaseous and particulate fire suppression systems. Examination and evaluation of code criteria, performance specifications and research. Application of fluid dynamics to the design process and the calculation procedures for gaseous particulate fire suppression systems. An integrated fire protection systems design project. Functional analysis and design of detection systems.

ENFP 300 Fire Protection Fluid Mechanics (3) Prerequisites: MATH 246 and PHYS 262 and ENES 221. Basic principles of fluid dynamics and the development of modern theories of fluid flow. Pressure distribution in a fluid. Hydrostatic and hydrodynamic problems. Integral relations for control volumes. Differential relations and dimensional analysis. Application of fluid dynamics to the design process and the calculation procedures for gaseous particulate fire suppression systems. An integrated fire protection systems design project. Functional analysis and design of detection systems.

ENFP 310 Water Based Fire Protection Systems Design (3) Recommended: ENFP 300. Study of aqueous suspension spray systems and their engineering and control. An introduction to the fundamentals of fire protection problems. Examination of specifications, code criteria, published criteria and research utilized in the engineering design of aqueous agent suppression systems. Application of fluid dynamics to the design process and the calculation procedures for gaseous particulate fire suppression systems. An integrated fire protection systems design project. Functional analysis and design of detection systems.

ENFP 312 Heat and Mass Transfer (3) Prerequisites: (ENCH 300 or ENME 320 or ENME 217) and (ENCH 330 or ENME 330 or ENME 321). An introduction to the fundamentals of heat and mass transfer. Conduction, convection, radiation modes of heat transfer. Diffusion concepts and evaporation phenomena. Problem solving techniques with application to fire problems.

ENFP 320 Fire Assessment Methods and Laboratory (4) Three hours of lecture and two hours of laboratory per week. For ENFP majors only. Experimental evaluation of ignition, flame spread, rate of heat release and smoke production of furnishings and interior finishes and materials.

ENFP 350 Professional Development Seminar (1) Prerequisite: permission of department. Senior standing. An integrative, upper level professional development seminar covering various topics such as engineering ethics, professional licensing, computer-aided design, intellectual property, career selection and various contemporary issues in fire protection engineering and related fields of engineering.

ENFP 405 Structural Fire Protection (3) Prerequisite: ENES 220. For ENFP majors only. Effects of elevated temperature on structural materials; steel, concrete, wood, gypsum, glass and reinforced plastics. Experimental evaluation of fire resistance of building assemblies. Analytical methods to evaluate fire resistance of structural members.

ENFP 411 Fire Risk Assessment (3) Prerequisites: ENMP 251; and ENMP 255. Appraisal and measurement of fire safety. Application of systems analysis, probability theory, engineering economics and fire detection system design. Application of fluid dynamics to the design process and the calculation procedures for gaseous particulate fire suppression systems. An integrated fire protection systems design project. Functional analysis and design of detection systems.

ENFP 415 Fire Dynamics (3) Prerequisites: ENMP 300 or ENME 330 or ENME 342; and ENME 330 or ENME 342. An introduction to the fundamentals of heat and mass transfer. Conduction, convection, radiation modes of heat transfer. Diffusion concepts and evaporation phenomena. Problem solving techniques with application to fire problems.

ENFP 416 Problem Synthesis and Design (3) Senior standing. Techniques and procedures of problem orientation and solution design utilizing logical and numerical procedures. Student development of research projects in selected areas.

ENFP 421 Life Safety and fire analysis (3) Prerequisite: ENMP 320. For ENFP majors only. Egress analysis. Characteristics of people movement in corridors and stairways. Human response to fire. Tenability analysis.
ENGL 360 African, Indian and Caribbean Writers (3) Prerequisite: lower-level English courses, at least one in literature; or permission of department. Selected writers from countries formerly colonies of Britain, France, Denmark, etc. Attention to ways literature has developed distinctive narrative and aesthetic values resulting from their various traditions and foreign influences.

ENGL 362 Caribbean Literature in English (3) Prerequisite: two lower-level English courses, at least one in literature; or permission of department. Written traditions that intersect in the fiction, poetry, and drama written in English by Caribbean writers, primarily during the 20th century.

ENGL 368 Special Topics in the Literature of Africa and the African Diaspora (3) Prerequisite: two lower-level courses, at least one in literature; or permission of department. Repeatable to 9 credits if content differs. Focus on accommodating technical material and empirical studies to lay audiences, and helping writers to achieve stylistic flexibility and correctness.

ENGL 391 General English Composition (3) Prerequisite: ENGL 101 or equivalent. Techniques of argumentation and persuasion. Repeatable to 9 credits if content differs. Two writers studied intensively each semester.

ENGL 404 Shakespeare: The Later Works (3) Prerequisite: two English courses in literature or permission of department. Close study of selected works from the second half of Shakespeare’s career. Generic issues of later tragedies, later comedies, romances. Language, theme, dramatic technique, sources, and early modern English social-historical context.

ENGL 407 Non-dramatic Literature of the Sixteenth Century (3) Prerequisite: two English courses in literature or permission of department. Major Modernist writers in English prose and poetry since 1900. Such writers as Eliot, Larkin, Forster, Burgess, Durrell, Henry Green, Golding, Auden, Malcolm Lowry, Joyce, and Yeats.

ENGL 414 Milton (3) Prerequisite: two English courses in literature or permission of department. Selected writings by women in the medieval and early modern era.

ENGL 417 Literature of the Seventeenth Century, 1660-1700 (3) Prerequisite: two English courses in literature or permission of department. Works through the Interregnum period. Major literary genres in historical contexts. Writers such as Donne, Jonson, Mary Wroth, Bacon, Browne, and Marvell.

ENGL 420 Literature of the Victorian Period I (3) Prerequisite: two English courses in literature or permission of department. Reconstruction, Realism, Naturalism. Representative writers such as Dickens, Thackeray, the Brontës, Tennyson, Browning, Carlyle, Mill.

ENGL 424 American Drama (3) Prerequisite: two English courses in literature or permission of department. American drama from late eighteenth-century to the present; emphasis on theater of the twentieth century. Authors such as Tyler, O’Neill, Hellman, Hare, and Albee.

ENGL 433 American Literature: 1914 to the Present (3) Prerequisite: two English courses in literature or permission of department. Modernism, Pluralism. Writers such as Stevens, Stein, Faulkner.
philosophical contexts; technical developments in the genre. Authors such as Melville, Wells Brown, James, Sedgwick, Chopin.

ENGL 447 Satire (3) Prerequisite: two English courses in literature or permission of department. An introduction to English and American satire from Chaucer to the present. Authors such as Auben, Williams, Plath, Browns, Wellouct, Ted Hughes, Bishop, Larkin, Jarrel, and Berryman.

ENGL 448 Post-Modern British and American Poetry (3) Prerequisite: two English courses in literature or permission of department. Exploration of the literary expression of the black American in the United States, from its roots to the present. Poets such as Auden, Pound, Eliot, Langston Hughes, Moore, Stevens, and Williams.

ENGL 450 Renaissance Drama I (3) Prerequisite: two English courses in literature or permission of department. Drama of the sixteenth century, from Sir Thomas More's cycle through Lyly, Greene, Marlowe, and their successors. Interludes, school drama, comedy and tragedy, professional theater. Influences of humanism, Protestantism, politics, and cultural change.

ENGL 451 Renaissance Drama II (3) Prerequisite: two English courses in literature or permission of department. Drama in the early decades of the seventeenth century. Plays include Jonson, Middleton, Marston, Webster and Beaumont and Fletcher. Tragedy, comedy, satire, masque. Pre-Civil War theatrical, political, and religious contexts.

ENGL 452 English Drama From 1660 to 1800 (3) Prerequisite: two English courses in literature or permission of department. Restoration and eighteenth-century drama, with special attention to theater history, cultural influences, concepts of tragedy, comedy, farce, burlesque, as well as dramatic and verbal wit.

ENGL 453 Literary Theory (3) Prerequisite: two literature courses. An indepth study of literary and critical theory.

ENGL 454 Modern Drama (3) Prerequisite: two English courses in literature or permission of department. The origins and development of the British novel, from the eighteenth century to the present. Authors such as Austen, Bronte, Dickens, George Eliot, Trollope.

ENGL 455 Modern British and American Poetry (3) Prerequisite: two English courses in literature or permission of department. The modern movement in poetry from 1910 to the present. Poets such as Auden, Williams, Plath, Brooks, Lowell, and Bishop.

ENGL 456 Post-Modern British and American Poetry (3) Prerequisite: two English courses in literature or permission of department. An introduction to English and American poetry from the 1930s to the present. Poets such as Auden, Williams, Plath, Brooks, Lowell, and Bishop.

ENGL 457 The Modern Novel (3) Prerequisite: two English courses in literature or permission of department. The modern novel in the novel of the twentieth century. Such writers as Joyce, Lawrence, Murdoch, James, Forster, Faulkner, Hemingway, Fitzgerald, Ellison, Welty, Nabokov and Malamud.

ENGL 458 Literature by Women after 1800 (3) Prerequisite: two English courses in literature or permission of department. Repeatable to 9 credits if content differs. Also offered as WMST 458. Credit will be granted for only one of the following: ENGL 458 or WMST 458. Selected writings by women after 1800.

ENGL 459 Folk Narrative (3) Personal history narrative; studies in oral, tale and myth.

ENGL 460 Folksong and Ballad (3) A cross-section of American folk and songs in their cultural contexts; artists from Bill Monroe to Robert Johnson.

ENGL 462 American Folklore (3) An examination of American folklores in terms of history and regional folk cultures. Prerequisite: permission of Director of English Honors.

ENGL 464 American-African Folklore and Culture (3) The culture of African Americans in terms of United States history (ante-bellum to the present) and social changes (rural to urban). Exploration of aspects of African American culture and history via oral and literary traditions and life histories.

ENGL 466 Arthurian Legend (3) Prerequisite: two English courses in literature or permission of department. Development of Arthurian legend in English and continental literature from Middle Ages to twentieth century. All readings in modern English.

ENGL 467 The Computer and the Text: Hypermedia as Critical Theory and practice of multimedia computing. Course analyzes the cultural impact of computing, students learning to use computers as providing alternative forms of expression, and allows students to create projects in an interactive computer theatre environment.

ENGL 468 American Film Directors (3-9) Prerequisite: one college-level film course. Repeatable to 9 credits if content differs. A study of two or more American filmmakers in an analytic cultural context.

ENGL 469 Honors Seminar: Alternative Traditions (4-5) Prerequisite: permission of Director of English Honors. Repeatable to 9 credits if content differs. Yearlong seminar focusing on a selected literary, cultural, or social topic that features texts and/or critical perspectives outside the traditional canon.

ENGL 470 African-American Literature: The Beginning to 1910 (3) Prerequisite: two English courses in literature or permission of department. Beginnings of African-American literature including contributions in folk tales, songs, and spirituals; slave narratives; pamphlets, essays and oratory; and the emergence of poetry and fiction. Emphasis is placed on the interaction between literary forms and the salient political issues of the day.

ENGL 471 African-American Literature: 1910-1945 (3) Prerequisite: two English courses in literature or permission of department. Emergence of modernism in African-American writing. Focus on African-American aesthetics, with emphasis on conditions surrounding the production of African-American literatures.

ENGL 472 African-American Literature: 1945 to Present (3) Prerequisite: two English courses in literature or permission of department. Transformation of African-American literatures into modern and postmodern forms. Influenced by World War II and the Civil Rights and Black Power movements, this literature is characterized by content, form, and style of new literary forms and striking new literary forms and styles.

ENGL 473 Modern Science Fiction (3) Prerequisite: two English courses in literature or permission of department. Major works of science fiction since the mid-twentieth century. Emphasis on the science fiction genre and its relationship to other science fiction genres. Also offered as WMST 473. Repeatable to 9 credits if content differs.

ENGL 474 American English (3) Prerequisite: ENGL 396 or permission of department. Repeatable to 9 credits if content differs. Formerly ENGL 496. Practice in the craft of writing poetry, with emphasis on the revision process. Students encouraged to experiment with a variety of subjects, forms, and selection for frequent writing exercises, workshop format.

ENGL 475 Selected Topics in English and American Literature (3) Prerequisite: two English courses in literature or permission of department. Repeatable if content differs.

ENGL 476 Modern American Drama (3) Prerequisite: two English courses in literature or permission of department. Major works of American drama since the mid-twentieth century. Emphasis on the drama genre and its relationship to other drama genres.

ENGL 477 Studies in Mythmaking (3) Prerequisite: two literature courses. Major themes, figures, and configurations of Arthurian legend in English and continental literature. Also offered as WMST 477. Repeatable if content differs.
standing. Characterization of the structure of materials including single crystal and polycrystalline materials. Laboratories will include X-ray and electron diffraction and microscopy.

ENMA 411 Materials Laboratory II: Electromagnetic Properties (3) One hour of lecture and six hours of laboratory per week. Prerequisites: ENMA 410. Junior standing. Characterization of the electromagnetic properties of materials. Laboratories will include measurements of electrical and transport properties, index of refraction, and magnetic properties.


ENMA 363 Microprocessing of Materials (3) Prerequisite: ENES 230. Emphasis on thin film processing for advanced technologies.

ENMA 420 Intermediate Ceramics (3) Prerequisite: ENMA 410. Junior standing. Study of advanced ceramics and microscopy. Characterization of the various types of advanced ceramics (superconductors; superconductor; dielectrics including ferroelectric; optical materials; high temperature structural materials; etc.) and allow an understanding of their behaviors.

ENMA 460 Physics of Solid Materials (3) Prerequisites: MATH 241 and PHYS 263. Senior standing. Study of solid materials; introduction to basic microstructural physics, mechanical, electrical, thermal, magnetic and optical responses of materials; importance of microstructure in behavior. One application of each property will be discussed in detail.

ENMA 461 Thermodynamics of Materials (3) Prerequisite: ENES 230. Senior standing. Study of the thermodynamic aspects of materials; basic concepts and their application in design and processing of materials and systems. Topics include: energy, entropy, adiabatic and isothermal processes, internal and free energy, heat capacity, phase equilibria and surfaces and interfaces.

ENMA 462 Deformation of Engineering Materials (3) Prerequisite: ENES 230 or permission of both department and instructor. Relationship of structure to the mechanical properties of materials. Elastic and plastic deformation, nucleation and growth, microscopic yield criteria, state of stress and ductility. Elements of dislocation theory, work hardening, alloy strengthening, creep, and fracture in terms of dislocation theory.


ENMA 464 Environmental Effects on Engineering Materials (3) Prerequisite: ENES 230 or permission of both department and instructor. Introduction to the phenomena associated with the resistance of materials under severe environmental conditions. Oxidation, corrosion, stress corrosion, corrosion fatigue and radiation damage are examined from the point of view of mechanism and influence on the properties of materials. Methods of analysis and criteria for selection of materials for use in radiation environments.

ENMA 470 Structure and Properties of Engineering Materials (3) A comprehensive survey of the atomic and electronic structure of solids with emphasis on the relationships of structure to the physical and mechanical properties.

ENMA 471 Kinetics, Diffusion and Phase Transformations (3) Pre- or co-requisite: ENMA 461. Junior standing or permission of department. Fundamentals of diffusion, the kinetics of reaction, nucleation and growth and phase transformations in materials.


ENMA 481 Introduction to Electronic and Optical Materials (3) Prerequisite: ENES 230 equivalent. Electrons, optics and magnetic properties of materials. Emphasis on materials for advanced optoelectronic and magnetic devices and the relationship between properties and the processing fabrication conditions.

ENMA 489 Selected Topics in Engineering Materials (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. To introduce basic concepts such as crystal chemistry, defect chemistry, crystal and ternary phase equilibria which can also be used to illustrate the various types of advanced ceramics (superconductors; superconductor; dielectrics including ferroelectric; optical materials; high temperature structural materials; etc.) and allow an understanding of their behaviors.

ENMA 490 Materials Design (3) One hour of lecture and six hours of laboratory per week. Senior standing. Capstone design course. Students work in teams on projects evaluating a society or industry based materials problem and then design and evaluate a strategy to minimize or eliminate the problem; includes written and oral presentations.


ENMA 496 Processing and Engineering of Polymers (3) Prerequisite: ENMA 495. Processing and engineering of polymeric materials into products are discussed. Processes considered include forming, bonding and modification operations. The effect of processing on the structure and properties of polymeric materials is emphasized.

ENMA 499 Senior Laboratory Project (1-3) Senior standing. Students work with a faculty member on an individual laboratory project in one or more of the areas of engineering materials. Students will design and carry out experiments, interpret data and prepare a comprehensive laboratory report.

ENME — Engineering, Mechanical

ENME 201 Careers in Mechanical Engineering I (1) Prerequisites: senior standing. Pathway to mechanical engineering. Career paths. Research and professional areas in the Mechanical Engineering Department. The Mechanical Engineering Profession.

ENME 372 Thermodynamics (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: PHYS 262. Introduction to thermodynamics of matter. First and second laws of thermodynamics, cycles, reactions, and mixtures.


ENME 414 Computer-Aided Design (3) Prerequisites: ENME 205 and MATH 241 or equivalent. Introduction to computer graphics, plotting and drawing with computer software. Principles of writing interactive software. The applications of computer graphics in computer-aided design. Computer-aided design.


ENME 486 Vibrations, Controls, and Optimization II (3) Two hours of lecture and two hours of discussion/recitation per week. Prerequisites: ENME 351 and ENME 361. Continuation of ENME 351. Fundamental concepts and optimization. Analysis and design in time, Lagrange and frequency domains. Mathematical descriptions of system response, system stability, control and optimization. Optimal dynamic of mechanical systems.

ENME 488 Special Problems (3) Prerequisite: permission of department. Advanced problems in mechanical engineering with special emphasis on mathematical and experimental methods.
Approved Courses 195

FOL A — Foreign Language

FOL A 108 Elementary Foreign Languages I (3) Repeatable if content differs. The first semester of conversational study of a language not otherwise offered. The arts and humanities language requirement. Repeatable if content differs. The second semester of conversational study of a language not otherwise offered. The arts and humanities language requirement may be fulfilled by successful completion of FOL A 108, FOL A 109, FOL A 118 and FOL A 119 in a single language.

FOL A 109 Elementary Foreign Languages II (3) Prerequisite: FOL A 108. Repeatable if content differs. The third semester of conversational study of a language not otherwise offered. The arts and humanities language requirement may be fulfilled by successful completion of FOL A 108, FOL A 109, FOL A 118 and FOL A 119 in a single language.

FOL A 118 Intermediate Foreign Languages I (3) Prerequisite: FOL A 108 in the subject language or permission of department. Repeatable to 9 credits if content differs. The first semester of conversational study of a language not otherwise offered. The arts and humanities language requirement may be fulfilled by successful completion of FOL A 108, FOL A 109, FOL A 118 and FOL A 119 in a single language.

FOL A 119 Intermediate Foreign Language I (3) Prerequisite: FOL A 118 in the subject language or permission of department. Repeatable if content differs. Developing intermediate language skills, in both grammar and vocabulary; enhancement of oral and writing abilities.

FOL A 128 Introductory Middle Eastern Languages I (3) Prerequisite: permission of department. Repeatable to 9 credits if content differs. An introduction to the three principal languages of the Middle East: Arabic, Persian, and Turkish. Only standard written form of the three languages is taught. May not be used to satisfy arts and humanities language requirement.

FOL A 129 Introductory Middle Eastern Languages II (3) Prerequisite: FOL A 128. Repeatable if content differs. The third semester of conversational study of a language not otherwise offered. The arts and humanities language requirement may be fulfilled by successful completion of FOL A 108, FOL A 109, FOL A 118 and FOL A 119 in a single language.

FOL A 138 Directed Study of a Foreign Language I (3) Open only by permission of department to students of high motivation and proven language learning aptitude. Directed study of a modern foreign language with use of a self- instructional approach.

FOL A 139 Directed Study of a Foreign Language II (3) Prerequisite: FOL A 138 in the same language or permission of department. A continuation of FOL A 138.

FOL A 148 Directed Study of a Foreign Language III (3) Prerequisite: FOL A 139 in the same language or permission of department. A continuation of FOL A 139.

FOL A 149 Directed Study of a Foreign Language IV (3) Prerequisite: FOL A 148 in the same language or permission of department. A continuation of FOL A 148.

FOL A 158 Directed Study of a Foreign Language (Intensive I) (6) Open only by permission of department to students of very high motivation and proven language learning aptitude. Intensive directed study of a modern foreign language with use of a self-instructional approach. Equivalent to FOL A 138 plus FOL A 139.

FOL A 159 Directed Study of a Foreign Language (Intensive II) (6) Prerequisite: FOL A 158 in the same language or permission of department. A continuation of FOL A 158. Equivalent to FOL A 148 plus FOL A 149.

FOL A 228 Intermediate Middle Eastern Languages I (3) Prerequisite: FOL A 129 and permission of department. Repeatable to 9 credits if content differs. Continuation of FOL A 129. May not be used to satisfy arts and humanities language requirement.

FOL A 239 Advanced Middle Eastern Languages II (3) Prerequisite: FOL A 328 or permission of department. Repeatable to 9 credits if content differs. Continuation of FOL A 328. May not be used to satisfy arts and humanities language requirement.

FOL A 388 Foreign Civilization (3) Repeatable to 6 credits if content differs. A survey of the cultural history, arts and letters, folklore and life-style of a language not otherwise offered. All readings and instruction in English.

FOL A 408 Foreign Language I (3) Intensive study of a foreign language or related topic not available under one of the current foreign language departments or programs. May not be used to fulfill the arts and humanities language requirement.

FOL A 409 Foreign Language II (3) Prerequisite: FOL A 408 in the same language or topic. A continuation of FOL A 408. May not be used to fulfill arts and humanities language requirement.

FREN — French

FREN 101 Elementary French I (4) Four classroom meetings per week plus one laboratory hour per week. Not open to students with 2 or more years of high-school level French or to native/ fluent speakers of French. Introduction to basic structures and pronunciation with emphasis on the four skills: listening, speaking, reading and writing.

FREN 102 Elementary French II (4) Four classroom meetings plus one laboratory hour per week. Prerequisite: FREN 101 at the time of registration or permission of instructor. Further work on basic structures and pronunciation with emphasis on the four skills: listening, speaking, reading and writing.

FREN 103 Review of Elementary French (4) Limited to students who have had at least two years of high school French or equivalent or who do not qualify for FREN 203. Credit will be granted for only one of the following: FREN 101, FREN 102 or FREN 103.

FREN 121 Accelerated French I (3) Prerequisite: good background in at least one other foreign language (successful completion of level 4 in high school or equivalent at the university level); or linguistic competence acquired by residence abroad; or demonstration of equivalent proficiency. An intensive beginning course in a foreign language with the skills to enable the student to move more quickly to advanced courses. With FREN 122, may be used to satisfy language requirements.

FREN 200 French For Reading (3) Not open to students who have completed one year of French before the start of their college studies (this last one year is not for students for whom French is the native language. Intensive course designed to bring students to a basic reading and translating competence of ordinary literary and scientific French, with the aid of a dictionary, in one semester. Study of essential grammar, but no spoken or written French involved. May not be used to satisfy the language requirement of the College of Arts and Humanities.

FREN 202 Honors Intermediate French (4) Four hours of lecture per week. Credit will be granted for only one of the following: FREN 202 or FREN 203. Intrductory readings in French literature and culture for students wishing an intensive, accelerated version of FREN 203. Designed primarily for highly motivated students and honors students. Fulfills the Arts and Humanities language requirement.

FREN 203 Intermediate French (4) Completion of the study of basic grammatical structures, with readings, conversation, and composition. Fulfills the Arts and Humanities language requirement.

FREN 204 Review Grammar and Composition (3) Prerequisite: FREN 203. An intensive review of major aspects of contemporary grammatical usage; training in comprehension and guided composition.

FREN 211 Intermediate Conversation (3) Not open to native speakers. Prerequisite: FREN 203 or permission of department. Practice in spoken French with emphasis on contemporary French topics.

FREN 240 Masterworks of French Literature in Translation (3) Major works of French literature from pre-revolutionary France to the present. Emphasis on the individual in a social context. In English.

FREN 241 Women Writers of French Expression in Translation (3) Also offered as WMST 241. Credit will be granted for only one of the following: FREN 241 or WMST 241. Works and ideas of women writers from Canada, Africa, the Caribbean and France. Taught in English.

FREN 242 Black Writers of French Expression in Translation (3) An analysis of the works and ideas of 20th century black writers of French in Africa, the Caribbean and France. Taught in English.

FREN 250 Readings in French (3) Prerequisite: FREN 203 or equivalent. Not open to native speakers. Readings from various genres in French literature. Discussion and brief written reports in French.

FREN 301 Composition and Style (3) Prerequisite: FREN 204 or permission of department. Grammatical analysis, free and guided composition. With FREN 302 Practicum in Translation I (3) Prerequisite: FREN 301 or permission of department. Problems and strategies of translation into both English and French. Journalistic and literary styles.
FREN 303 Practicum in Translation II (3) Prerequisite: FREN 301 or permission of department. Problems and strategies of translation into both English and French. Commercial, political and diplomatic styles.

FREN 306 Commercial French I (3) Prerequisite: FREN 301 or permission of department. Introduction to commercial French including preparation and business terminology. Emphasis on cross-cultural concepts needed for successful interaction within business settings. In French.

FREN 311 French Conversation (3) Prerequisite: any 200-level course in French above FREN 203 or permission of department. Not open to native speakers. Development of aural comprehension and oral expression through use of radio and television broadcasts.

FREN 312 Introduction to French Culture: The French Press (3) Prerequisite: any 200-level course in French above FREN 203 or permission of department. Not open to native speakers. Analysis and discussion of articles from French and Francophone printed media, reflecting a variety of sources and styles.

FREN 351 From Romanticism to the Age of Modernism and Beyond (3) Prerequisite: FREN 204 or FREN 250 or permission of department. A survey of the chief authors and major movements of French literature from the Romanticism to the present. Taught in English.

FREN 352 From the Age of Epic and Romance to the Enlightenment (3) Prerequisite: FREN 204 or FREN 250 or permission of department. A survey of the chief authors and major movements of French literature from the Middle Ages to the end of the 18th century.

FREN 370 Aspects of French Civilization (3) Credit may not be counted toward a French major. Political, social, intellectual, and literary forces shaping contemporary France, from the French Revolution to the present. Taught in English.

FREN 399 Practicum in Spoken French (1) Prerequisite: FREN 312 or permission of department. Credit may not be counted toward a French major. Repeatable to 3 credits. Practice in French conversation at the advanced level.

FREN 399 Directed Study in French (1-3) Prerequisite: permission of department. Repeatable to 3 credits. Intended for advanced students who wish to work on an individual basis with a professor of their choice. Open as elective to all students, but may not be counted toward French major. May be taken for one, two or three credits, according to nature and scope of work envisaged. Grading method: Satisfactory/ Fail only.

FREN 400 Applied Linguistics (3) The nature of applied linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and French, with emphasis upon points of divergence. Analysis, evaluation and construction of related didals.

FREN 401 Writing with Style (3) Prerequisite: FREN 301 or permission of department. Advanced composition and stylistic analysis.

FREN 404 Issues in the French-Speaking World Today (3) Prerequisite: FREN 311 or FREN 312 or permission of department. A sociocultural and historical approach to relevant issues affecting contemporary French civilization. Press articles and television programs will be the basis for classroom cultural analysis and oral communication.

FREN 405 Explication De Texte (3) Indepth analysis of short literary works, or of excerpts selected for their historical, cultural, thematic or stylistic interest.

FREN 406 Commercial French II (3) Prerequisite: FREN 306 or permission of department. Advanced study of commercial French language—terminology and style—leading to preparation for the Paris Chamber of Commerce Examination.


FREN 419 Studies in Medieval French Literature (3) Repeatable to 6 credits if content differs. Selected topics in medieval French literature.

FREN 429 Studies in French Literature of the Renaissance (3) Repeatable to 6 credits if content differs. Selected topics in French literature of the Renaissance.

FREN 439 Studies in 17th Century French Literature (3) Repeatable to 6 credits if content differs. Selected topics in seventeenth-century French literature.

FREN 449 Studies in 18th Century French Literature (3) Repeatable to 6 credits if content differs. Selected topics in eighteenth-century French literature.

FREN 459 Studies in 19th Century French Literature (3) Repeatable to 6 credits if content differs. Selected topics in nineteenth-century French literature.

FREN 469 Studies in 20th Century French Literature (3) Repeatable to 6 credits if content differs. Selected topics in twentieth-century French literature.

FREN 471 The Construction of French Identity I: From the Origins to the 3rd Age of Versailles French life, customs, culture, traditions (1750 to the mid-twentieth century).

FREN 472 The Construction of French Identity II: From the Revolution to the 3rd the Early Twentieth Century French life, customs, culture, traditions (1750 to the early twentieth century).

FREN 473 The Construction of French Identity III: Cross-Cultural Approaches: Society Patterns of communication, mythology, and ideology in modern France, from the Third Republic to the present, through historical and cultural approaches, with reference to the Francophone world.


FREN 478 Themes and Movements of French Literature in Translation (3) Studies treatments of thematic problems or of literary or historical movements in French literature. Topic to be determined each semester. Taught in English.

FREN 479 Major Works of French Literature in Translation (3) Treats the works of one or more major French writers. Topic to be determined each semester. Taught in English.


FREN 481 Femmes Fatales and the Representation of Violence in Literature, (3) Opera and Film (in English) The problem of violence in art with respect to women and marginal populations. Taught in English.

FREN 482 Gender and Ethnicity in Modern French Literature and Cultural Studies (3) The literature of France and other French-speaking areas with a focus on the relationship between gender, ethnicity and writing. Taught in English.

FREN 483 I and They: Conflict Between Individual and Society in French Literature (3) Literature of the 20th century. The alienation of the individual in conflict with society reflected in French works from the absolutist society of the 17th century to the disintegration of societal norms today. Taught in English.

FREN 484 The Age of Anxiety: Existentialism and the Absurd in French Literature (3) Existentialism and one Absurd in 20th century French literature. Taught in English.

FREN 485 Ideologies and Relations Between the Sexes in French Literature (3) Men and women in English literature. The evolution of sexual roles in the Western world as reflected in masterworks of French literature from the 12th to the 20th centuries. Taught in English.

FREN 489 Pro-Seminar in Themes or Movements of French Literature (3) Repeatable to 6 credits if content differs.

FREN 495 Honors Thesis Research (3) Open only to students admitted to the department honors program. The writing of a paper under the direction of a professor in this department and an oral examination. Required to fulfill the departmental honors requirement.

FREN 498 Special Topics in French Literature (3) Repeatable to 6 credits if content differs.

GEMS 102 Research Topic Exploration (1) For Gemstone participants only. Under the viability and other visiting speakers, students will develop research topics that they will pursue for the remainder of their participation in the Gemstone program, and they will also form into interdisciplinary teams.

GEMS 201 Technological Innovation: A Sociological Perspective (3) For Gemstone participants only. Recommended: GEMS 101. The impact of technology broadly defined to include the role of information technology in (1) the organization of work in a comparative perspective; (2) on the rate of innovation in products; (3) on the nature of competition and its feedback on the organization and the larger society; and (4) various adaptive strategies that firms and governments can use to handle the turbulence of technological waves. Emphasis on the new technologies, including flexible manufacturing of the last ten years.

GEMS 208 Special Topics in Leadership and Team Development (1-3) Principles, methods and types of leadership and team development with an emphasis on group discussion and decision making. Reading, discussion and exploration of the basic team concept, communications for winning scenarios, goal setting, problem solving, conflict resolution and research methods.

GEMS 296 Team Project Seminar I (2) Prerequisite: GEMS 101. For Gemstone participants only. Students will develop and use teamwork skills and carry out interdisciplinary research under the general guidance of a faculty mentor. The student subgroups will investigate broad interdisciplinary challenges of societal, environmental, business or policy significance that have a significant technological component in the potential solution.

GEMS 396 Team Project Seminar II (2) Prerequisite: GEMS 296. For Gemstone participants only. Students will continue to develop and use teamwork skills and carry out interdisciplinary research under the general guidance of a faculty mentor. The student subgroup will investigate broad interdisciplinary challenges of societal, environmental, business or policy significance that have a significant technological component in the potential solution.

GEMS 496 Team Project Seminar III (1) Prerequisite: GEMS 396. For Gemstone participants only. Students will further develop teamwork skills and carry out interdisciplinary research under the general guidance of a faculty mentor. The student subgroups will investigate broad interdisciplinary challenges of societal, environmental, business or policy significance that have a significant technological component in the potential solution.

GEMS 498 Team Project Seminar IV (1) For Gemstone participants only. Students will develop and use teamwork skills to complete the team project research and thesis. The team will formally present the thesis to experts in the area of interest.

GEOG — Geography

GEOG 100 Introduction to Geography (3) An introduction to the broad field of geography as it is applicable to the general education student. The course presents the basic rationale of variations in human occupancy of the earth and stresses geographic concepts relevant to understanding world, regional and local issues.

GEOG 110 The World Today: A Regional Geography (3) An examination of the functioning world today and the regions and major countries that are part of the whole. Organized around the framework of modern and traditional lifestyles with the aim of understanding the interdependencies of the world and its regions for the general education student.

GEOG 120 Nations in Conflict: A Spatial View (3) The geographic characteristics of conflict areas around the world. Issues common to international disputes such as: uneven access to resources, population pressures, religious differences and boundary disputes.

GEOG 123 Causes and Implications of Global Change (3) Also offered as GEOG 123, METO 123, and PBIO 123/BSCI 123. Credit will be granted for only one of the following: GEOG 123, GEO 123, METO 123, or PBIO 123/BSCI 123. A unique experience in integrating physical, chemical, geological, and biological sciences with geographical, economic, sociological,
and political knowledge skills toward a better understanding of global change. Review of environmental science relating to weather and climate change, acid precipitation, ozone holes, global warming, and impacts on biology, agriculture, human behavior, and political knowledge. Concepts of how physical, biological, and cultural systems interact, and the repercussions which may follow human endeavors. The manner in which to approach decision and policy making related to global change.

GEOG 130 Developing Countries (3) An introduction to the geography of development problems and prospects of developing countries. Spatial distribution of poverty, employment, migration and urban growth, agricultural productivity, rural and urban policies and international trade. Portraits of selected developing countries.

GEOG 140 Coastal Environments (3) Introduction to coastal environments, with emphasis on U.S. East Coast. Physical and ecological systems, beach processes, waves, currents, human impacts, coastal management, and coastal engineering. Case studies of coastal areas, including Ocean City, Maryland.

GEOG 150 World Cities (3) An introduction to the forces that affect the growth of cities in different parts of the world. Regional variations in city design and examples of great world cities. The impact of changing technologies, economic and social change on the evolution of the city. Current and emerging trends.

GEOG 170 Maps and Map Use (3) The use and interpretation of maps encountered in both “everyday” reading and in scientific literature. Development of skills in map reading, environmental analysis, interpretation and orientation.

GEOG 171 Maps and Map Use Laboratory (1) Two hours of laboratory per week. Pre- or co-requisite: GEOG 170. A laboratory course to accompany GEOG 170. Experience with maps as research tools; coordinate systems; projections; measurement of angles, directions, distance, area; topographic maps; map interpretation; symbolism; statistical mapping; spatial arrangement; and remote sensing.

GEOG 201 Geography of Environmental Systems (3) A systematic introduction to the processes and associated forms of the atmosphere and earth’s surfaces emphasizing the interaction between climatology, hydrology and geomorphology.

GEOG 202 The World in Cultural Perspective (3) The imprint of culture on language and landscapes in the world of men and women, on the earth’s landscape. The transformation of the earth’s surface as a result of cultural diversity, settlement patterns, political organization, cultural evolution, and population growth.

GEOG 203 Economic Geography (3) The spatial characteristics of world and regional economic activities. Population patterns; technology and economic development; principles of spatial interaction and diffusion; development of skills in map reading, environmental analysis, interpretation and orientation.

GEOG 211 Geography of Environmental Systems Laboratory (1) Two hours of laboratory per week. Pre- or co-requisite: GEOG 201. A laboratory course to accompany GEOG 201. Analysis of the components of the earth’s energy balance using basic instrumentation; weather map interpretation; soil analysis; the application of map and air photo interpretation techniques to landform analysis.

GEOG 212 The World in Cultural Perspective Laboratory (1) Two hours of laboratory per week. Pre- or co-requisite: GEOG 202. For GEOG majors only. Introduction to the basic methods and techniques employed in human geography.

GEOG 298 Special Topics in Geography (3) Repeatable to 6 credits if content differs. An introductory course dealing with special topics in geography.

GEOG 305 Quantitative Methods in Geography (3) A practical introduction to data sources and measurement, descriptive statistics, statistical correlation, sampling and questionnaire design, field techniques, map use, computer use and data presentation.

GEOG 310 Research and Writing in Geography (3) Prerequisite: GEOG 305. Development of research methods in geography including the formulation of the problem, the establishment of research goals, development of study questions for testing hypotheses, and practice with forms of geographic presentation. Maps, quantitative and field methods are used as appropriate.

GEOG 320 The United States and Canada (3) The two countries as functioning geographic systems with important differences and key linkages. An examination of the cultural, environmental, and economic components and their spatial variation. Attention to the roles of regions in national policies.

GEOG 321 Maryland and Adjacent Areas (3) The physical and cultural environment, and population in relation to agriculture, industry, transport, and trade in the State of Maryland and adjacent areas.

GEOG 323 Latin America (3) A geography of Latin America and the Caribbean in the contemporary world: political and cultural regions, population and resource distribution; historical development, current levels of economic and social wellbeing, urbanization, development policies, migration trends, physical features and climates.

GEOG 324 Europe (3) The geographical diversity of modern Europe, with special reference to the diverse physical features of Europe’s physical environment and resource base, and their integration into the demographic, economic, social and political patterns of the continent’s major geographic regions.

GEOG 325 Russia and the Commonwealth States (3) Russia and the Commonwealth of Independent States: its ethnic and cultural diversity, historical development, resource base, and economic regions. The characteristics of the relationship existing between Russia and the Commonwealth States.

GEOG 326 Africa (3) A geography of sub-Saharan Africa: physical features, climates, political and cultural regions, distributions and resource distribution, current levels of economic and social wellbeing, urbanization development policies, projects and constraints, and migration trends.

GEOG 328 Topics in Regional Geography (3) Repeatable to 6 credits if content differs. Selected topics in regional geography.

GEOG 331 Southeast Asia (3) Spatial organization and development in and among Malaysia, Singapore, Indonesia, Thailand, Laos, Vietnam, Cambodia and Kampuchea and adjacent countries. Locational significance of the natural environment, historical and cross-cultural processes, social change and conflicts.


GEOG 345 Climatology (3) The geographic aspects of climate with emphasis on energy budget, climate and climatic variations at both macro and micro scales. Atmosphere, ocean, land interactions and weather, climate change.

GEOG 347 Introduction to Biogeography (3) Prerequisite: GEOG 201. Recommended: GEOG 211. The principles of biogeography, including the patterns, processes and distributions of living organisms from local to global scales, aspects of the evolution of the earth, natural resources, and community ecology and evolutionary biology. Biological processes in the biosphere will be covered.

GEOG 350 The American City: Past and Present (3) Development of the city from the early 19th century to the present. The internal structure of contemporary metropolitan areas, the spatial arrangement of residential, commercial, industrial and other activities. Washington, D.C. and Baltimore examples.

GEOG 360 Cultural Geography (3) Prerequisite: GEOG 201 or GEOG 202 or ANTH 101 or ANTH 102. Junior standing. Credit will be granted for only one of the following: GEOG 360 or GEOG 420. Formerly GEOG 420. Impact of humans through ideas and technology on the evolution of geographic landscapes. Major themes in the relationships between cultures and environments.

GEOG 361 Introduction to Human Dimensions of Global Change (3) Prerequisite: GEOG 101 or GEOG 202 or ANTH 220/101 or ANTH 260/102 or permission of department. Introduction to global-scale interrelationships between human and physical environments, and the environmental and global issues of special significance in the development of these countries.

GEOG 362 Cultural Geography (3) Prerequisites: GEOG 201 or GEOG 202 or ANTH 220/101 or ANTH 260/102 or permission of department. Not open to students who have completed GEOG 360. Credit will be granted for only one of the following: GEOG 360 or GEOG 362. Formerly GEOG 360. Impact of human ideas and technology on the evolution of geographic landscapes. Major themes in the relationships between cultures and environments.

GEOG 371 Computer Cartography (3) Two hours of lecture and two hours of laboratory per week. Pre- or co-requisite: GEOG 373 or GEOG 376. Formerly GEOG 370. Principles of cartographic database, earth-map relations, map design, symbolization and color usage. Practical skills of making different thematic maps using simple software packages.


GEOG 373 Geographic Information Systems (3) Two hours of lecture and two hours of laboratory per week. Characteristics and organization of geographic data; creation and use of digital spatial databases; use of geographic information system models for thematic mapping and map analysis; use of geographic information system in society, government, and business. A laboratory course with use of advanced software and geographic databases.

GEOG 380 Local Field Course (3) Training in geographic field methods and techniques. Field observation of land use in selected rural and urban areas in Maryland and adjacent areas.

GEOG 384 Internship in Geography (3) Prerequisite: GEOG 305; and GEOG 310; and permission of department. Co-requisite: GEOG 385. Supervised field training to provide career experience. Introduction to professional level activities, demands, opportunities. Placement at a public agency, non-profit organization, or private firm. Participation requires application to the internship advisor in preceding semester.

GEOG 385 Internship Research Paper (3) Prerequisite: GEOG 305; and GEOG 310; and permission of department. Co-requisite: GEOG 385. Seminar to include on-campus and off-campus internships under the guidance of a faculty advisor, culminating in a written and oral presentation of a research proposal.

GEOG 397 Honor Thesis (3) Prerequisite: GEOG 398. Senior standing. For GEOG majors only. Formerly GEOG 397. First course in the departmental honors sequence. A research paper to be defended orally under the guidance of a faculty advisor, culminating in a research paper to be defended orally before the geography honors committee.

GEOG 398 Special Topics in Geography (3) Prerequisite: permission of department. Restricted to junior standing. Credit will be granted for only one of the following: GEOG 298 or GEOG 398. Formerly GEOG 298. An introductory course in special topics in geography.

GEOG 399 Honors Thesis (3) Prerequisite: GEOG 398. Second course in departmental honors sequence. Student research under the auspices of a faculty advisor, culminating in a research paper to be defended orally before the geography honors committee.


GEOG 411 19th Century North America (3) An analysis of the changing geography of the U. S. and Canada from 1810 to the 1920’s. The settlement, expansion and socio-economic development of the U. S., and comparisons with the Canadian experience. Immigration, economic activities, industrialization, transportation and urbanization.

GEOG 414 Historical Geography of the Hispanic World (3) The social, economic, political and cultural geography of the countries of the Iberian peninsula and Latin America in the past 500 years. Concentration on special topics of special significance in the development of these countries.

GEOG 416 Overseas European Colonization and the Third World (3) The impact of European overseas expansion on Africa, Asia and Australasia in the 19th and early 20th centuries. Settlement patterns and territorial organization. Cultural and demographic change. Economic organization of space.

GEOG 421 Cultural Ecology (3) Basic issues concerning the natural history of humans from the perspective of cultural ecology. Basic concepts of the human and natural systems, their evolution and adaptation, and survival strategies.

GEOG 422 Population Geography (3) The spatial characteristics of population distribution and growth, migration, fertility and mortality from the point of view of basic population-environmental relationships; carrying capacity, density, relationships to national development.
Cenozoic, constructional and erosional landforms related to physical systems operating on geologic structures through time.

GEOL 341 Structural Geology (3) Three hours of lecture and three hours of laboratory per week. Prerequisite: GEOL 102 or permission of department. Deformation of the earth's crust; stress and earthquake; behavior of rocks; significance of structural features. Construction of geological maps and cross sections; stereo-geographic and orthographic representation of structures.

GEOL 342 Sedimentation and Stratigraphy (4) Three hours of lecture and four hours of laboratory per week. Prerequisite: GEOL 102 or permission of department. Description, origin, and distribution of sediments and sedimentary rocks. Mandatory field trips.

GEOL 393 Technical Writing in Geoscience (Prerequisite: Completion of any of the following: GEOL 341, GEOL 331, GEOL 322, and GEOL 451. For GEOL majors only. Planning, writing, and editing of professional reports. Written and oral presentation of the study.

GEOL 410 Industrial Rocks and Minerals (Prerequisite: GEOL 322. The origin; occurrence; mineralogy; extraction and treatment; distribution and deposition of rocks; and minerals used in the construction; cement, chemical, and allied industries. Restricted to non-fuels, non-metallic, non- gem materials. Field trips to industrial locations are required.

GEOL 423 Optical Mineralogy (3) One hour of lecture and four hours of laboratory per week. Prerequisite: GEOL 102. The optical behavior of crystals with emphasis on the theory and application of the petrographic microscope.

GEOL 436 Principles of Biogeochemistry (3) Three hours of lecture per week. Prerequisite: MATH 140 or 220, CHEM 103, GEOL 100 or 103 or 110. An introduction to the basic principles of biogeochemistry including aspects of organic geochemistry, biochemistry, microbiology, global geochemical cycles, and environmental aspects.

GEOL 437 Global Climate Change: Past and Present (3) Prerequisite: CHEM 103, MATH 115, GEOL 100 or 120 or 120T. The goal of the course is to highlight the fact that the global climate is part of the Earth's past as well as of its present and future state. Emphasis on the present and past climate in the geologic past can be viewed as the Earth's natural climate variability. Processes of change are different from those that could be linked to historical and contemporary anthropogenically-induced climate change. We will discuss the modern climate system, the factors capable of forcing climate change on various timescales, the geologic proxies of past climate change and what these proxies tell us. Finally, we will compare and contrast past climate change with what is understood (and not understood) about climate change.

GEOL 442 Introduction to Solid-Earth Geophysics (3) Prerequisite: GEOL 100 or 103 or GEOL 105 or GEOL 107. Formerly GEOL 448. Nature and description of the solid earth as revealed by seismology; magnetic and gravity surveys; and studies of remote sensing methods. Development of plate tectonic theory. Earthquake predictions; mantle thermal convection; fluid motion in Earth's core; space-related methods for direct measurement of the geophysical field, and geological implications.

GEOL 443 Petrology (4) Two lectures and one laboratory per week. Prerequisite: GEOL 322. Co-requisite: GEOL 423. Study of igneous and metamorphic rocks; petrogenesis; distributions; chemical and mineralogical relations; macroscopic and microscopic descriptions; geochemical significance.

GEOL 445 Principles of Geochemistry (3) Prerequisite: CHEM 103 and GEOL 322. An introduction to the basic principles of geochemistry including geothermometry, geobarometry, geochronology and the genesis of natural inorganic materials.

GEOL 446 Geophysics (3) Two lectures and one laboratory per week. Prerequisite: GEOL 102 or permission of department. Formerly GEOL 442. An introduction to the basic theories and principles of geophysics stressing such important applications as rock magnetism, gravity anomalies, crustal strain and seismic surveys.

GEOL 451 Groundwater Geology (3) Prerequisite: (CHEM 103 or MATH 140) and (GEOL 110 or GEOL 103 or GEOL 105 or GEOL 107). Corequisite: GEOL 342. Introduction to the basic geographic parameters associated with the hydrologic system: the accumulation, distribution, and movement of groundwater will be analyzed.

GEOL 452 Watershed and Wetland Hydrology (3) Prerequisite: CHEM 103 and (GEOL 110 or GEOL 103 or GEOL 105 or GEOL 107) and (CHEOL 302 or GEOL 341 or GEOL 341 or GEOL 342), 56 semester hours. Junior standing. Physical processes by which water moves in watershed and wetland systems: pre-wetland: surface flow such as unsaturated zone, streamflow generation processes, and groundwater flow.

GEOL 453 Economic Geology (3) Two laboratories per week. Prerequisite: GEOL 322. A study of the geology of metallic ore deposits; ores; and deposits in sedimentary environments; characteristics of ore deposits; and ore formation processes.

GEOL 456 Engineering Geology (3) Two lectures and one laboratory per week. Prerequisite: GEOL 321. A study of the geology of geotechnical problems associated with the infrastructure: tunnels, bridges, dam and nuclear reactors, slope control, and natural hazards.

GEOL 462 Geophysical Remote Sensing (3) One lecture and two laboratories per week. Prerequisite: GEOL 341 and GEOL 342. An introduction to both terrestrial and remote-sensing sensors and applications of aerial photographic interpretation to problems in regional geology, engineering geology, structural geology, and geophysical geology. Other important topics will include digital processing and remote-sensing applications.

GEOL 472 Tectonics (3) Prerequisite: GEOL 341. Selected tectonic elements of orogenic belts throughout the world viewed from the framework of plate tectonics and sea floor spreading.

GEOL 489 Special Topics (3) Corequisite: GEOL 393. Senior standing. For GEOL majors only. Recent advances in geology.

GEOL 490 Geology Field Camp (6) Prerequisite: GEOL 390 or equivalent. Intensive field course geology taught off campus during the summer. Includes and compiles maps, and microtextual studies of the deposits stressing ore-forming processes, configuration of ore deposits, and familiarization with characteristic ore mineral suites.

GEOL 491 Environmental Geology Field Camp (3-6) Prerequisites: GEOL 341 and GEOL 491 or permission of instructor. Introduction to environmental remote sensing and the application of aerial photographic interpretation to problems in regional geology and engineering geology. The students will learn field techniques to locate, map, and describe fossil deposits and site characteristics, to monitor hydrologic and groundwater conditions, and to measure geologic structures and stratigraphic sections.

GEOL 499 Special Problems in Geology (3) Prerequisites: GEOL 102; and GEOL 110 or equivalent; and permission of department. Intensive study of a special geologic subject or technique. A field experience is intended to provide training or instruction not available in other courses which will aid the student's development in his or her field of major interest.

GERM — Germanic Studies

GERM 101 Elementary German I (4) One hour of laboratory and four hours of discussion/recitation per week. Prerequisite: GERM 101. Introduction to basic structures and pronunciation of standard German. Intended to provide training or instruction not available in other courses which will aid the student's development in his or her field of major interest.

GERM 102 Intermediate German I (4) One hour of laboratory and four hours of discussion/recitation per week. Prerequisite: GERM 101. Grammar review and greater mastery of vocabulary, idioms, conversational fluency, and compositional skills. Readings stress the current lifestyle and civilization of the German-speaking world.

GERM 202 Intermediate German II (4) Four hours of lecture and one hour of laboratory per week. Prerequisite: GERM 201. Continuation of GERM 201. Grammar review and greater mastery of vocabulary, idioms, conversational fluency, and compositional skills. Readings stress the current lifestyle and civilization of the German-speaking world.

GERM 220 Introduction to German Literature (3) Prerequisite: GERM 149 in the same language. Intermediate instruction in a Germanic language other than German. May be repeated in a different language. Subtitle will reflect the language.

GERM 249 Germanic Languages - Intermediate II (3) Prerequisite: GERM 248 in the same language. Continuation of GERM 248. May be repeated in a different language. Subtitle will reflect the language.

GERM 280 German-American Cultural Contrast (3) A study of German-American culture in contemporary literature.

GERM 281 Women in German Literature and Society (3) Also offered as WMST 281. Credit will be granted for only one of the following: GERM 281 or WMST 281. A study of changing literary representations of women from the beginning of the 19th century to the present.

GERM 282 Germanic Mythology (3) An introduction to the religious beliefs of the pagan Germanic peoples. Comparison of Germanic myths with those of other Indo-European peoples. The conversion of the Germania to Christianity and the preservation of pagan beliefs in superstition and literature.

GERM 283 Viking Culture and Civilization (3) Formerly GERM 383. An introduction to the lifestyle of northern Europe in the 9th to 11th centuries. Readings and instruction in English.

GERM 284 German Chivalric Culture (3) Formerly GERM 384. An introduction to the lifestyle of northern Europe in the 12th to 14th centuries. Readings and instruction in English.

GERM 285 German Film and Literature (3) A visual approach to German literature through a study of the historical, cultural, and literary significance of German films. Representative films from a golden age of German silent films to the new German cinema.

GERM 286 Ancient Indic Culture and Civilization (3) Formerly GERM 371. An introduction to the culture and civilization of Ancient India: religion, literature, arts, and law of the vedic,斯基拉, and śrama periods. Development of the principles which ruled everyday activities. Instruction and readings in English.


GERM 289 Selected Topics in the Cultures of the Germanic Spoken Countries (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Topics in the cultures of the Germanic spoken countries.

GERM 2890 The Germanic Speaking Countries in the New Europe (3)

GERM 301 Conversation and Composition I (3) Prerequisite: GERM 202 or equivalent. Practice in contemporary spoken and written German. Systematic review of grammar, and exercise in composition. Emphasis on oral and written expression.

GERM 302 Conversation and Composition II (3) Prerequisite: GERM 301 or equivalent. Continuation of GERM 301.

GERM 321 Highlights of German Literature I (3) Prerequisite: GERM 220 or equivalent. Selected masterworks from different periods of German literature: middle ages, reformation, baroque, 18th century, classicism. Readings and instruction in German.
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GERM 322 Highlights of German Literature II (3) Prerequisite: GERM 221. Masterworks from different periods of German literature: romanticism, Biedemeier, juxtaposition, realism, naturalism and its counter currents, expressionism to the present. Readings and instruction in German.

GERM 339 German Literature in Translation (3) Repeatable to 6 credits if content differs. Selected movements, genres or other special topics in German literature. Readings and instruction in English. May not be counted in the fulfillment of German major requirements in German literature.

GERM 349 Germanic Literatures in Translation (3) Repeatable to 6 credits if content differs. Study of an important author, period or theme in a Germanic literature other than German, Yiddish, Scandinavian or Finnish. Readings and instruction in English.

GERM 360 Women in Scandinavian Literature (3) Prerequisite: a literature, diversity course or permission of department. Introduction to and examination of women's creative work in Scandinavia from the Middle Ages to the present.

GERM 368 Scandinavian Civilization (3) Repeatable to 6 credits if content differs. Literary, artistic and historic traditions, folklore and superstition, customs and lifestyle shared by Scandinavian nations. Readings and instruction in English.

GERM 369 Scandinavian Literature in Translation (3) Repeatable to 6 credits if content differs. Study of a major Scandinavian author, genre, period or theme. Readings and instruction in English.

GERM 381 German Civilization I (3) A survey of the literary, educational and artistic traditions, great men and women, customs and general culture of the German-speaking world from the beginnings to the middle of the 18th century. All readings and instruction in English.

GERM 382 German Civilization II (3) A continuation of GERM 381 covering the development of German, Austrian and Swiss civilizations from the middle of the 18th century to the present. All readings and instruction in English.

GERM 389 Topics in Germanic Culture (3) Repeatable to 6 credits if content differs. Topics in the cultures of the German, Germanic, Indo-European peoples and of their culturally related non Indo-European neighbors. In English.

GERM 389M Minority Languages and Cultures in Germany (3)

GERM 397 Honors Reading (Independent Study) (3) Supervised reading to be taken normally only by students admitted into honors program.

GERM 398 Honors Research (3) Prerequisite: permission of department. Preparation of a thesis. Preparatory work for students who wish to write a thesis. Readings and instruction in English.

GERM 401 Advanced Conversation (3) Prerequisite: GERM 302 or equivalent. Development of fluency in spoken German. Discussion of contemporary issues.

GERM 403 Advanced Composition (3) Prerequisite: GERM 302 or equivalent. Advanced instruction in writing skills.

GERM 405 Stylistics (3) Prerequisite: GERM 302 or equivalent. Stylistic analysis of oral and written German both literary and non-literary. Intensive study of vocabulary and syntax. Dictionary and composition exercises.

GERM 411 German for International Business I (3) Prerequisite: GERM 302 or equivalent or permission of department. Advanced skills in German for international business, including understanding and writing correspondence, reports, graphics, ads, etc., according to current German commercial style.

GERM 412 German for International Business II (3) Prerequisite: GERM 411 or equivalent or permission of department. Continuation of GERM 411.

GERM 415 German/English Translation I (3) Does not fulfill major requirements in German. Not open to students who have completed GERM 101, GERM 102, GERM 201, GERM 202, GERM 301, or GERM 302. An intensive presentation of German grammar limited exclusively to reading skill; graded readings in the arts and sciences. Instruction in English; cannot be used to satisfy the arts and humanities foreign language requirement.

GERM 416 German/English Translation II (3) Prerequisite: GERM 415. A further translation of materials from the student’s field of study. Discussion of basic problems of German-to-English translation, with examples from students’ projects. Instruction in English. Cannot be used to satisfy the arts and humanities foreign language requirement.

GERM 419 Selected Topics in German Language Study (3) Prerequisite: GERM 302 or equivalent. Prerequisite: permission of department. Repeatable to 6 credits if content differs.

GERM 421 Literature of the Middle Ages (3) Prerequisite: GERM 321 and GERM 322 or permission of department. German literature from the 8th through the 15th centuries. Readings include Old High German heroic and popular epic; Minnesang, Meistersinger, die late Medieval epic; folk literature of the late Middle Ages. Read in modern German translation.

GERM 422 From the Reformation Through the Baroque (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the reformation and the period of humanism through the baroque (ca. 1450-1700). Readings and instruction in German.

GERM 423 From Enlightenment Through Storm and Stress (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the Enlightenment (1720-1785), the Age of Sentimentalism (1740-1780), and Storm and Stress (1767-1785). Readings and instruction in German.

GERM 424 Classicism (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the Age of Classicism (1780-1830). Readings and instruction in German.

GERM 427 Realism, Naturalism, and the Counter-currents (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the periods of Romanticism and Biedemeier (1820-1850). Readings and instruction in German.

GERM 389 Topics in Germanic Culture (3) Repeatable to 6 credits if content differs. Topics in the cultures of the German, Germanic, Indo-European peoples and of their culturally related non Indo-European neighbors. In English.

GERM 389M Minority Languages and Cultures in Germany (3)

GERM 397 Honors Reading (Independent Study) (3) Supervised reading to be taken normally only by students admitted into honors program.

GERM 398 Honors Research (3) Prerequisite: permission of department. Preparation of a thesis. Preparatory work for students who wish to write a thesis. Readings and instruction in English.

GERM 401 Advanced Conversation (3) Prerequisite: GERM 302 or equivalent. Development of fluency in spoken German. Discussion of contemporary issues.

GERM 403 Advanced Composition (3) Prerequisite: GERM 302 or equivalent. Advanced instruction in writing skills.

GERM 405 Stylistics (3) Prerequisite: GERM 302 or equivalent. Stylistic analysis of oral and written German both literary and non-literary. Intensive study of vocabulary and syntax. Dictionary and composition exercises.

GERM 411 German for International Business I (3) Prerequisite: GERM 302 or equivalent or permission of department. Advanced skills in German for international business, including understanding and writing correspondence, reports, graphics, ads, etc., according to current German commercial style.

GERM 412 German for International Business II (3) Prerequisite: GERM 411 or equivalent or permission of department. Continuation of GERM 411.

GERM 415 German/English Translation I (3) Does not fulfill major requirements in German. Not open to students who have completed GERM 101, GERM 102, GERM 201, GERM 202, GERM 301, or GERM 302. An intensive presentation of German grammar limited exclusively to reading skill; graded readings in the arts and sciences. Instruction in English; cannot be used to satisfy the arts and humanities foreign language requirement.

GERM 416 German/English Translation II (3) Prerequisite: GERM 415. A further translation of materials from the student’s field of study. Discussion of basic problems of German-to-English translation, with examples from students’ projects. Instruction in English. Cannot be used to satisfy the arts and humanities foreign language requirement.

GERM 419 Selected Topics in German Language Study (3) Prerequisite: GERM 302 or equivalent. Prerequisite: permission of department. Repeatable to 6 credits if content differs.

GERM 421 Literature of the Middle Ages (3) Prerequisite: GERM 321 and GERM 322 or permission of department. German literature from the 8th through the 15th centuries. Readings include Old High German heroic and popular epic; Minnesang, Meistersinger, die late Medieval epic; folk literature of the late Middle Ages. Read in modern German translation.

GERM 422 From the Reformation Through the Baroque (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the reformation and the period of humanism through the baroque (ca. 1450-1700). Readings and instruction in German.

GERM 423 From Enlightenment Through Storm and Stress (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the Enlightenment (1720-1785), the Age of Sentimentalism (1740-1780), and Storm and Stress (1767-1785). Readings and instruction in German.

GERM 424 Classicism (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the Age of Classicism (1780-1830). Readings and instruction in German.

GERM 427 Realism, Naturalism, and the Counter-currents (3) Prerequisite: GERM 321 and GERM 322, or permission of department. Readings of representative authors from the periods of Romanticism and Biedemeier (1820-1850). Readings and instruction in German.

GERM 389 Topics in Germanic Culture (3) Repeatable to 6 credits if content differs. Topics in the cultures of the German, Germanic, Indo-European peoples and of their culturally related non Indo-European neighbors. In English.

GERM 389M Minority Languages and Cultures in Germany (3)

GERM 397 Honors Reading (Independent Study) (3) Supervised reading to be taken normally only by students admitted into honors program.

GERM 398 Honors Research (3) Prerequisite: permission of department. Preparation of a thesis. Preparatory work for students who wish to write a thesis. Readings and instruction in English.

GERM 401 Advanced Conversation (3) Prerequisite: GERM 302 or equivalent. Development of fluency in spoken German. Discussion of contemporary issues.

GERM 403 Advanced Composition (3) Prerequisite: GERM 302 or equivalent. Advanced instruction in writing skills.
GVPT 200 International Political Relations (3) Prerequisite: GVPT 100. An introduction to the study of international relations, the methods of conducting foreign relations, the foreign policies of the major powers, and the means of avoiding or alleviating international conflicts.

GVPT 210 Introduction to Public Administration and Policy (3) Prerequisite: GVPT 100. An introduction to the study of the administrative process in the executive branch with an examination of the concepts and principles of administration and the relationship to public policy. The organizational structure, theory and the behavior of participants in the administration of policy.

GVPT 220 Introduction to Political Behavior (3) Prerequisite: GVPT 100 or GVPT 170. Development, concepts and techniques of political science and their relationship to political science and other recent developments in the field.

GVPT 221 Introduction to Formal Theories of Political Behavior and Politics (3) Prerequisite: GVPT 170. An introduction to the theories of rational choice including theories of negotiation and bargaining, elections and voting in democracies, community organizing and the contrast between the roles and performances of government and market.

GVPT 231 Law and Society (3) Prerequisite: GVPT 170. A study of the legal system in contemporary society, and its relationship with various contemporary institutions such as the courts, the legal profession, and society at large.

GVPT 240 Political Ideologies (3) Prerequisite: GVPT 100. A survey and analysis of the leading ideologies of the modern world, including, but not limited to, capitalism, communism, socialism, fascism, nationalism, and democracy.

GVPT 241 The Study of Political Philosophy: Ancient and Modern (3) Prerequisite: GVPT 100. Examines some of the salient continuities and breaks between the ancient and modern traditions in Western political philosophy.

GVPT 250 Introduction to International Negotiation (3) Prerequisite: GVPT 100. Recommened: GVPT 200. An introduction to the complexities of international negotiation and cross-cultural decision-making. Students will apply advanced computer technology in an interactive simulation involving actual negotiations.

GVPT 260 State and Local Government (3) Prerequisite: GVPT 170. A study of the functioning and problems of state and local government in the United States, with illustrations from Maryland jurisdictions.

GVPT 270 Introduction to Public Policy (3) Prerequisite: GVPT 170. Complex nature of public policy making at the national level in the United States. Policy making will be described and analyzed in terms of major actors, relationships, and characteristics.

GVPT 272 The Politics of Race Relations in the United States (3) Prerequisite: GVPT 170. Political dimension of historical and contemporary racial cleavage in the United States with particular emphasis on the post World War II period.

GVPT 273 Introduction to Environmental Politics (3) Prerequisite: GVPT 170. Comprehensive overview of environmental problems, institutions, policies, practices, and remedies found in present-day world society, with special emphasis on environmental matters as objects of American public policy, both domestic and foreign.

GVPT 280 Comparative Politics and Governments (3) Prerequisite: GVPT 100. An introduction to the comparative study of politics and governance, including the analytical frameworks for studies of politics and governmental institutions and a survey of the major types of European regimes.

GVPT 282 The Government and Politics of the Third World (3) Prerequisite: GVPT 100. A study of the governmental institutions, and the sociopolitical environment which are common to the great majority of the Third World states of Africa, the Middle East, Asia, and Latin America, and in which internal politics develop.

GVPT 289 Special Topics in Government and Politics (1-6) Repeatable to 6 credits if content differs. A study of some substantive and theoretical approaches to political phenomenon. Topics and credit vary.

GVPT 306 Global Ecopolitics (3) Prerequisite: GVPT 200. Consideration of global problems such as the growth of human population, agricultural productivity, pollution, resource depletion, the energy crisis, and the general impact of science and technology on the world ecological, socio-economic, and political environment, with particular emphasis on such matters as public policy.

GVPT 309 Topics in International Relations (3) Repeatable to 6 credits if content differs. The study of topics in international relations.

GVPT 312 Intermediate Formal Theories of Political Behavior and Politics (3) Prerequisite: GVPT 200. A study of the main formal theories of political behavior and politics, with emphasis on recent and contemporary trends in the field and their relation to other aspects of international affairs.

GVPT 339 Topics in Public Law (3) Repeatable to 6 credits if content differs. The study of topics in public law.

GVPT 341 Political Morality and Political Action (3) Prerequisite: GVPT 100 and 220. The ethical problems implicit in public actions by individuals, groups, and government. Selected topics in contemporary political theory such as distribution, participation, and community.

GVPT 349 Topics in Political Philosophy (3) Repeatable to 6 credits if content differs. The study of topics in political philosophy.

GVPT 350 International Relations of the Third World (3) Prerequisite: GVPT 200. A systemic view of relations between the industrialized world and the Third World. The study of international relations of the Third World, their relationship to public policy.

GVPT 359 Topics in Comparative Politics (3) Repeatable to 6 credits if content differs. The study of topics in comparative politics.

GVPT 376 Applied Field Research in Government and Politics (3) Prerequisite: GVPT 170. Corequisite: GVPT 377. Students in this course participate as interns in an agency of government or in some other appropriate political organization. Assignments are arranged to provide students with insights into both the theoretical and practical aspects of political life. Under the tutelage of the host agency and an academic advisor, students conduct a major research project of mutual interest to the student and the host agency or her host agency in the field of government and politics.

GVPT 377 Seminar For Academic Interns (3) Prerequisite: GVPT 170. Corequisite: GVPT 376. The application of major concepts, methods and theories of political science to the realities of the political process. Readings and discussion attempt to relate the experiences of the academic interns to appropriate literature on the subject of political decision-making.

GVPT 379 Topics in American Politics (3) Repeatable to 6 credits if content differs. The study of topics in American politics.

GVPT 388 Topical Investigations (1-3) Prerequisite: one 200-level GVPT course. Repeatable to 6 credits if content differs. Independent research and writing on selected topics in government and politics.

GVPT 396 Introduction to Honors Research (3) Prerequisite: GVPT 200. Honors Program. In this required course for all honors students designed to emphasize library research, methodology, and writing skills in political science, students will write a thesis proposal, bibliography and research design for an honors paper required of all students as a final project.

GVPT 397 Honors Research (3) Prerequisite: GVPT 396 and admission to GVPT honors program. Individual reading and research. Preparation of an original paper, with emphasis on originality, and defense.

GVPT 399 Seminar in Government and Politics (3) Prerequisite: one 200-level GVPT course. Reading, research, discussion, analysis, and writing in the area of politics. Both substantive issues and methodological approaches will be considered. Primarily for government and politics undergraduates.

GVPT 401 Problems of World Politics (3) Prerequisite: GVPT 200. A study of governmental problems of international scope, such as nuclear war, war, problems of non-agency, and propaganda. Students are required to report on readings from current literature.

GVPT 402 International Law (3) Prerequisite: GVPT 200. A study of the basic character, general principles and specific rules of international law, with emphasis on recent and contemporary trends in the field and its relation to other aspects of international affairs.

GVPT 403 Law, Morality and War (3) Prerequisite: GVPT 200. An exploration of the relationship between international security and international law, with emphasis on nuclear war, conventional war, guerilla insurgency, arms control, disarmament, economic sanctions, military strategy and defense economics.

GVPT 406 Problems of International Cooperation (3) Prerequisite: GVPT 200. The analysis of the problems inherent in international cooperation with applications to specific international issues as the environment, human rights, economic development and conflict resolution.

GVPT 407 International Political Economy (3) Prerequisite: GVPT 200. The analysis of contemporary trends in the field and their relation to both economic and political reactions.

GVPT 409 Seminar in International Relations and World Politics (3) Repeatable to 6 credits if content differs. Reading, writing, and research on topics in international relations and world politics. Both substantive issues and methodological approaches will be considered. Primarily for government and politics majors.

GVPT 412 Public Personnel Administration (3) Prerequisite: GVPT 210. A survey of public personnel administration, including the development of merit civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee relations, and retirement.

GVPT 414 Civil Rights and the Constitution (3) Prerequisite: GVPT 200. Political dimensions of historical and contemporary social movements, community organizing, responsive public policy, institutional change, and civil rights litigation. Some of the topics will involve research projects.

GVPT 419 Seminar in Public Policy (3) Repeatable to 6 credits if content differs. An evaluation of theories of public behavior such as game, social choice and voting theory, and their applications to problems of distribution and social justice, community organizing, responsive public policy, institutional change, and civil rights litigation. Some of the topics will involve research projects.

GVPT 422 Quantitative Political Analysis (3) Prerequisite: GVPT 220. Introduction to quantitative methods of data analysis, including selected statistical methods, block analysis, content analysis, and scale construction.

GVPT 423 Elections and Electoral Behavior (3) Prerequisite: GVPT 220. An examination of various topics relating to electoral politics, the focus includes the electoral process for which elections are conducted, the selection and nomination process, the conduct of election campaigns, and patterns of political participation and voting choice in different types of elections.

GVPT 424 Topics in Formal Theories of Political Behavior and Politics (3) Prerequisite: GVPT 221 or permission of department. The focus of this course will vary both by its theoretical core and its applications. The theories are likely to be those of games, social choice, and voting. The applications will usually be those to problems of distributive and social justice, community organizing, responsive public policy, institutional change, and civil rights litigation. Some of the topics will involve research projects.

GVPT 426 Civil Rights and the Constitution (3) Prerequisite: GVPT 220. An examination of public opinion and its effect on political action, including emphasis on opinion formation and measurement, propaganda and pressure groups.

GVPT 427 Political Sociology (3) Prerequisite: GVPT 220. A study of the societal aspects of political life including selected aspects of the sociology of group formation and group dynamics, political association, community integration and political behavior.

GVPT 428 Topics in Formal Theories of Political Behavior and Politics (3) Prerequisite: GVPT 221 or permission of department. Repeatable to 6 credits if content differs. An evaluation of theories of political behavior such as game, social choice and voting theory, and their applications to problems of distribution and social justice, community organizing, responsive public policy, institutional change, and civil rights litigation. Some of the topics will involve research projects.

GVPT 431 Introduction to Constitutional Law (3) Prerequisite: GVPT 231. A systematic inquiry into the general principles of the American constitutional system, with special reference to the role of the judiciary in the interpretation and enforcement of the federal constitution.

GVPT 432 Civil Rights and the Constitution (3) Prerequisite: GVPT 231. A study of civil rights in the American constitutional context, emphasizing freedom of religion, freedom of expression, minority discrimination, and the rights of defendants.
GVPT 433 The Judicial Process (3) Prerequisite: GVPT 231. An examination of the judicial process in the United States at all levels of government, with some emphasis on legal reasoning, legal research and court procedures.

GVPT 434 Race Relations and Public Law (3) Prerequisite: GVPT 231. A political and legal examination of the constitutionality of race relations in various areas of law, especially in consideration of the constitutional power of the federal courts, congress, and the executive to define, protect and extend these rights.

GVPT 436 The Legal Status of Women (3) Prerequisite: GVPT 231. Also offered as WMST 436. Credit will be granted for only one of the following: GVPT 436 or WMST 436. An examination of judicial interpretation and application of common, statutory, and constitutional law as these affect the status of women in American society.

GVPT 439 Seminar in Public Law (3) Repeatable to 6 credits if content differs. Reading, writing, and research on topics in public law. Both substantive issues and methodological approaches will be considered. Primarily for government and politics majors.

GVPT 441 History of Political Theory: Ancient and Medieval (3) Prerequisite: GVPT 100. A survey of the principal political theories set forth in the works of writers before Machiavelli.

GVPT 442 History of Political Theory—Medieval to Recent (3) Prerequisite: GVPT 100. A survey of the principal theories set forth in the works of writers from Machiavelli to Nietzsche.

GVPT 443 Contemporary Political Theory (3) Prerequisite: GVPT 100. A survey of the principal political theories and ideologies set forth in the works of writers from Karl Marx to the present.

GVPT 444 American Political Theory (3) Prerequisite: GVPT 100 or GVPT 170. A study of the development and growth of American political concepts from the Colonial period to the present.

GVPT 445 Marxism and Postmarxism (3) Prerequisite: GVPT 100. The study of Marxist thought and an assessment of the political thought originating in Asia, the Middle East, and Africa. This is not a substitute for WMST 436.

GVPT 446 Psychoanalysis and Politics (3) Prerequisites: GVPT 100 and GVPT 340. Psychological sources of individual and group behavior as applied to political phenomenon such as voting, war, revolution, and genocide.

GVPT 447 Islamic Political Philosophy (3) The writings of one or several authors from the rise of Islamic philosophy until today are examined in order to see how they understand the conflicting claims of revelations and unaided human reason about the best regime, justice, and human virtue.

GVPT 448 Non-Western Political Thought (3) Prerequisite: GVPT 100. An examination of the political thought in a variety of non-Western cultures but the course may be limited by the professor with each offering.

GVPT 449 Seminar in Political Philosophy (3) Repeatable to 6 credits if content differs. Reading, writing, and research on topics in political philosophy. Both substantive issues and methodological approaches will be considered. Primarily for government and politics majors.

GVPT 450 Comparative Study of Foreign Policy Formation (3) Prerequisite: GVPT 200. The opportunity to learn the theoretical underpinnings of foreign policy making and to apply this knowledge in a simulation of a "real world" negotiation arena.

GVPT 451 Foreign Policies of Russia and the States of the Former Soviet Union (3) Prerequisite: GVPT 280 or GVPT 282. A study of the development of the foreign policies of Russia and the successor states of the former Soviet Union, with attention paid to the processes of policy formation and the forces and conditions that make for continuities and changes.

GVPT 453 Recent East Asian Politics (3) Prerequisite: GVPT 280 or GVPT 282. The background and interpretation of recent political change in East Asia and its influence on world politics.

GVPT 455 Contemporary Middle Eastern Politics (3) Prerequisite: GVPT 280 or GVPT 282. A survey of contemporary development in the international politics of the Middle East, with special emphasis on the role of emerging Middle East nations in world affairs and an analysis of the major foreign policies of the United States.

GVPT 457 American Foreign Relations (2) Prerequisite: GVPT 200. The principles and machinery of the conduct of American foreign relations, with emphasis on the Departments of State and Defense, and an analysis of the major foreign policies of the United States.

GVPT 459 Seminar in Comparative Politics (3) Repeatable to 6 credits if content differs. Reading, writing, and research on topics in comparative politics. Both substantive issues and methodological approaches will be considered. Primarily for government and politics majors.

GVPT 460 Problems in State and Local Government (3) Prerequisite: GVPT 260. A study of the structure, procedures and policies of state and local governments with special emphasis on the state level and on intergovernmental relationships, as illustrated by Maryland local government arrangements.

GVPT 461 Metropolitan Government (3) Prerequisite: GVPT 260. An examination of administrative problems relating to public services, planning and coordination in a metropolitan environment.

GVPT 462 Urban Politics (3) Prerequisite: GVPT 260. Urban political processes and issues considered in the light of changing social and economic conditions.

GVPT 473 Legislatures and Legislation (3) Prerequisite: GVPT 170. A detailed survey of lawmaking and the legislative process, emphasizing the U.S. Congress and its members.

GVPT 474 Political Parties (3) Prerequisite: GVPT 170. A comparative study of the political parties, nominations, elections, and political leadership.

GVPT 475 The Presidency and the Executive Branch (3) Prerequisite: GVPT 170. An examination of the U.S. presidency in historical and contemporary perspective: nominations, state of the union, the president’s place in policymaking, administration, and public opinion.

GVPT 476 The Business Governmental Relationship (3) Prerequisite: GVPT 270. Examines the structures, processes, and outcomes of business and government and the products of their cooperative-adversarial relationship in the United States. The design integrates interest group and administrative politics and the public policy process.

GVPT 477 Seminar in American Politics (3) Repeatable to 6 credits if content differs. Reading, writing, and research on topics in American politics. Both substantive issues and methodological approaches will be considered. Primarily for government and politics majors.

GVPT 480 Comparative Political Systems (3) Prerequisite: GVPT 280 or GVPT 282. A comparative study of the governmental systems and political processes of the Latin American countries.

GVPT 481 Government and Administration of Russia and the States of the former Soviet Union (3) Prerequisite: GVPT 280 or GVPT 282. A comparative study of the governmental systems and political processes of the states of the former Soviet Union.

GVPT 482 Government and Politics of Latin America (3) Prerequisite: GVPT 280 or GVPT 282. A comparative study of the governmental systems and political processes of the Latin American countries.

GVPT 483 Government and Politics of Asia (3) Prerequisite: GVPT 280 or GVPT 282. A comparative study of governments and politics of Asian countries.

GVPT 484 Government and Politics of Africa (3) Prerequisite: GVPT 280 or GVPT 282. A comparative study of the governmental systems and political processes of the African countries, with special emphasis on the problems of nation-building in emerging countries.

GVPT 485 Government and Politics of the Middle East (3) Prerequisite: GVPT 280 or GVPT 282. A comparative study of the governmental systems and political processes of the Middle Eastern countries, with special emphasis on the problems of nation-building in emerging countries.

GVPT 486 Comparative Studies in European Politics (3) Prerequisite: GVPT 280 or GVPT 282. Comparative studies in the forms of governance, political processes, and public policies in European countries.

GVPT 492 The Comparative Politics of Race Relations (3) Prerequisite: GVPT 280 or GVPT 282. Impact of government and politics on race relations in the modern world: the origins, problems, and manifestations of such racial policies as segregation, apartheid, integration, assimilation, partnership, and multiculturalism will be analyzed.

HESP — Hearing and Speech Sciences

HESP 120 Introduction to Linguistics (3) An introduction to the scientific study of natural language with focus on the basic concepts of phonology, syntax, semantics and pragmatics, with subsequent attention to the applied aspects of linguistic principles.

HESP 121 Language and Society (3) Credit will be granted for only one of the following: HESP 109 or HESP 121. An introduction to the fundamental issues of sociolinguistic research.

HESP 202 Introduction to Hearing and Speech Sciences (3) An introduction to phonetics, the physiological bases of speech production and reception, and the physics of sound.

HESP 300 Introduction to Psycholinguistics (3) Prerequisite: HESP 109 or HESP 121. An introduction to current theories of language and an investigation of their relationship to human communication behavior. Survey of the experimental literature relating to this question.

HESP 305 Anatomy and Physiology of the Speech Mechanism (3) Prerequisite: HESP 202 or permission of department. Anatomy, physiology, and neurology of speech mechanism.

HESP 311 Anatomy, Pathology and Physiology of the Auditory System (3) Prerequisite: HESP 202 or permission of department. Gross anatomy of the ear and pathways for transmission of sound energy through the peripheral and central auditory system. Causes, development and effects of pathological conditions contributing to temporary or chronic hearing impairments.

HESP 400 Speech and Language Development in Children (3) Prerequisite: HESP 300 or HESP 120 or LNG 200 or permission of department. Analysis of the normal processes of language development in children.

HESP 402 Speech Pathology I (3) Prerequisite: HESP 400. Etiology, assessment and treatment of language and phonological disorders in children.

HESP 403 Introduction to Phonetic Science (3) Prerequisite: HESP 305 or permission of department. An introduction to physiological, acoustic and perceptual phonetics; broad and narrow phonetic transcription; current models of speech production and perception.

HESP 404 Speech Pathology II (3) Prerequisite: HESP 305. Etiology, assessment and therapeutic management of phonation, resonance, and fluency disorders in children and adults.
HESP 406 Speech Pathology III (3) Prerequisites: HESP 300 and HESP 401. An introduction to clinical procedures in the diagnosis and treatment of speech and language disorders in adults from an interdisciplinary point of view.

HESP 407 Bases of Hearing Science (3) Prerequisite: HESP 311 or permission of department. Fundamentals of hearing, including the physics of sound, anatomy and physiology of peripheral, central and peripheral auditory nervous system, psychophysical procedures used in measurement of auditory sensation and perception, and topics in psychological acoustics.

HESP 411 Introduction to Audiology (3) Prerequisite: HESP 311. An introduction to the field of audiology. Examination and remediation of hearing impairments.

HESP 417 Principles and Methods in Speech-Language Pathology and Audiology (3) Prerequisites: (HESP 311 and HESP 402) or permission of department. The principles underlying the treatment of speech, language and hearing disorders in children and adults.

HESP 418 Clinical Practice in Speech-Language Pathology and Audiology (3) Prerequisite: HESP 417. Repeatable to 6 credits. Supervised observation with some direct participation in clinical methods for the treatment of disorders of articulation, fluency, and adult language; evaluation and habilitation/rehabilitation of hearing impaired children and adults.

HESP 420 Deafness and Sign Language (3) Credit will be granted for either HESP 498P or HESP 420. An introduction to American Sign Language and Deaf Culture.

HESP 422 Neurological Bases of Human Communication (3) Prerequisite: HESP 305 or permission of instructor. Credit will be granted for only one of the following: HESP 498 or HESP 422. Basic principles of anatomy and physiology of substrates of speech and language.

HESP 423 Phonetics for Teachers of English as a Second Language (3) Credit will be granted for only one of the following: HESP 498P or HESP 423. An introduction to the phonetics and phonological system of standard North American English, materials and techniques in teaching pronunciation for teachers of English as a second language.

HESP 438 Seminar: Special Issues in Early Childhood Special Education (1-3)

HESP 469 Honor Thesis Research (1-3) Prerequisite: Honor thesis proposal approved. Repeatable to 6 credits if content differs. Student will develop thesis proposal, conduct research, analyze results, defend and defend final written document.

HESP 498 Seminar (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Selected topics in human communication and its disorders.

HESP 499 Independent Study (1-3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. A directed study of selected topics pertaining to human communication and its disorders.

HIST — History

HIST 106 American Jewish Experience (3) Also offered as JWST 141. Credit will be granted for only one of the following: HIST 106 or JWST 141. History of the Jews in America from colonial to modern times. Emphasis on the waves of immigration from Germany and Eastern Europe; the changing nature of the American Jewish community and its participation in American social, economic and political life.

HIST 110 The Ancient World (3) Interpretation of select literature and art of the ancient Mediterranean world with a view to illuminating the antecedents of modern culture; religion and myth in the ancient near East; Greek philosophical, scientific and literary invention; and the Roman tradition in politics and administration.

HIST 111 The Medieval World (3) The development of Europe in the Middle Ages; the role of religious values in shaping new social, economic, and political institutions; medieval literature, art and architecture.


HIST 123 Sub-Saharan Africa Since 1800 (3) Overviews early and mid-19th-century changes in African societies, European conquest and African resistances in the late 19th century, colonial states and societies, African nationalism and decolonization and the search for development. Studies over social, economic, and political changes are emphasized.

HIST 126 Jewish Civilization (3) Also offered as JWST 121. Credit will be granted for only one of the following: HIST 126 or JWST 121. Formerly HIST 105. Jewish history, culture, and society from Biblical times to the present.

HIST 156 History of the United States to 1865 (3) The United States from the end of the Civil War to the present. Emphasis on the economic, social, intellectual, and political developments. Rise of industry and emergence of the United States as a world power.

HIST 170 The Humanities I (3) Cultural development of Western civilization from prehistoric times to the Renaissance and influences on the common cultural heritage of Western civilization.

HIST 174 Introduction to the History of Science (3) Major issues in the development of modern science. Specific examples of discoveries and theories from the viewpoint of theories of science and the nature of the scientific enterprise. Principles of science, and interaction of science with philosophy.

HIST 175 Science and Technology in Western Civilization (3) Key periods of change in science and technology; the causes and effects of these changes beginning with prehistory and ending with the 18th century.


HIST 178 Biography in History (3) Repeatable to 6 credits if content differs. An introduction to the life and works of important and visible figures in world history. Concern for both the theory of the individual in history and close examination of the single person. Course content changes semester to semester.

HIST 180 The Chinese World (3) An introduction to China, both traditional and modern. Aspects of Chinese culture, including language, family, history, art, and agriculture.

HIST 209 Selected Topics (3)

HIST 210 Women in America to 1880 (3) Also offered as WMST 210. Credit will be granted for only one of the following: HIST 210 or WMST 210. History of the family and political roles of colonial, slave, immigrant and frontier women in America from pre-industrial colonial period through the early stages of the 19th-century industrialization and urbanization.

HIST 211 Women in America Since 1880 (3) Also offered as WMST 211. Credit will be granted for only one of the following: HIST 211 or WMST 211. An examination of women's changing roles in working class and middle class families, the effects of industrialization on women's economic activities and status, and women's involvement in political and social struggles including those for women's rights, birth control, and civil rights.

HIST 212 Women in Western Europe, 1750-Present (3) Also offered as WMST 212. Credit will be granted for only one of the following: HIST 212 or WMST 212. An analysis of the economic, family, and political roles of European women from 1750 to the present. The effects of industrialization on women's work and status, the demographic parameters of women's lives, and women's participation in political events from market riots to suffrage struggles.

HIST 216 Introduction to the Study of World Religions (3) Survey of the history of major faiths, their significance as social and cultural aspects of study of religion. Discusses major scholarly approaches to the study of religion.

HIST 219 Special Topics in History (3)

HIST 222 Modern Military History, 1498-1815 (3) Survey of the military history of Europe through an examination of the economic, financial, strategic, tactical, and technological aspects of the development of military institutions and warfare from the Congress of Vienna in 1815 to the present.

HIST 234 History of Britain to 1485 (3) British history from the War of the Roses to the English Reformation. The Anarchy, Scandinavian and Norman invasions; the coming of Christianity; Magna Carta, the development of Parliament, legal institutions and the Common Law; the decline of medieval kingship.

HIST 235 History of Britain 1461 to 1714 (3) British history from the War of the Roses to the English Revolution. Yorkist and Tudor society and politics; the Renaissance and Reformation in England, Henry VIII through Elizabeth I; 17th-century crises and revolutions. The transition of social and cultural changes; the beginnings of empire; the achievement of political and intellectual order.

HIST 236 History of Britain 1688 to Present (3) British history from the Glorious Revolution of 1688 to the present. The revolution of 1688; the structure of 18th-century society and politics; economic and social change in the Industrial Revolution; 19th and 20th-century political and social reform; the impact of the First and Second World Wars on British society.

HIST 237 Russian Civilization (3) An overview of Russian history stressing the main lines of development of the Russian state and the evolution of Russian culture to the present day.

HIST 250 Latin American History I (3) Latin America from pre-Columbian Indian cultures to the beginnings of the wars for independence (ca. 1810), covering cultural, political, social, and economic developments.

HIST 251 Latin American History II (3) The political culture of the republics of Latin America. Themes include nation building, modernization, race relations, economic development, gender, reform and revolution, and relations between the United States and Latin America.

HIST 254 African American History to 1865 (3) Survey of the principal developments in the history and culture of the peoples of African descent in colonial and post-colonial United States to 1865. Examines the African past, the Atlantic slave trade, variation in slavery, the growth of free black communities, the transformations of families and cultural forms, and patterns of resistance.

HIST 255 African American History, 1865 - Present (3) An introductory course in the African American experience in the United States from 1865 to the present. Topics include the aftermath of the Civil War on US race relations, the rise of segregation, northern migration, World War I and II, Civil Rights Movements, and the Black Power Movement.

HIST 257 The American West in History and Imagination (3) Examines the cultural and political development of the American West — as a place of lived experience and as an idea for which much of the United States’ national vision has evolved. Emphasizes the experiences of Native American and colonizing Euro-American peoples in regional context, and the interplay between historical realities and national mythologies.


HIST 265 Social and Cultural History of Modern America (3) American social history from the Civil War to the present. Examination of the social interactions accompanying the rise of male-dominated, business-oriented urban culture. Concentration on the major social forces clashing and cooperating to produce the modern United States: “business republicanism”; urban workers; intellectuals; rural populists; women (especially Jewish); and struggling women liberators. The crosscurrents of a “free society” wrestling with contradictions of the democratic experiment.

HIST 266 The United States in World Affairs (3) A study of the United States as an emerging world power and the American response to changes in world affairs. Emphasis on the relationship between internal and external development of the nation.

HIST 275 Law and Constitutionalism in American History (3) An exploration of the relationship between law and the social and political order between 1607 and the present. Emphasis on important historical issues—religious liberty, economic development, slavery and the Civil War, the political economy of industrialization, the creation of the modern state—from a legal and constitutional perspective.
HIST 280 Reconstructing the Civilization of Ancient Mesopotamia (3) as of 1927. Open to students who have completed HEBR 440. Credit will be granted for only one of the following: HIST 280 or JUWT 227. Formerly HEBR 441. The civilization of Ancient Mesopotamia, as reconstructed from archaeology, language, and texts of the region. Emphasis on culture, literature, religion, and institutions.

HIST 281 The Rabbinc Movement: History and Culture (3) Also offered as JUWT 230. Credit will be granted for only one of the following: HIST 281 or JUWT 230. Introduction to the Rabbinic movement and its history, first to seventh century CE. Survey of the essential texts of ancient rabbinic literature, both halakhic (legal) and aggadic (non-legal).

HIST 282 History of the Jewish People (3) Also offered as JUWT 231. Credit will be granted for only one of the following: HIST 282 or JUWT 234. Political, economic, social and cultural development within Jewish history from the Biblical period to the late Second Temple period. Attention to the emergence of Rabbinic Judaism and its subsequent encounter with medieval Christian and Islamic civilizations.

HIST 283 History of the Jewish People (3) Also offered as JUWT 235. Credit will be granted for only one of the following: HIST 283 or JUWT 234. Political, economic, social and cultural development within Jewish history from the medieval period to the present. Special attention to twentieth century developments including the Nazi holocaust and its aftermath, the Zionist movement and the creation of the State of Israel; rise of the contemporary American Jewish community.

HIST 284 East Asian Civilization (3) An interdisciplinary survey of the development of East Asian cultures. An historical approach covering all the areas of East Asian traditional life, to gain an appreciation of the different and complex cultures of the area.

HIST 285 East Asian Civilization II (3) A survey of the historical development of the Chinese culture. Emphasis will be on the rise of the modern era.

HIST 286 The Jew and the City through the Centuries (3) Also offered as JUWT 275. Credit will be granted for only one of the following: HIST 286 or JUWT 275. Jewish urban experience from the Biblical period to the modern era. Public space and private space. The city and the sacred. Jewish ghettoes and quarters. The struggle over modern Jerusalem.

HIST 305 The Eastern Orthodox Church: Its Cultural History (3) A study of the development of the Christian church in the Near East, Eastern Europe, and Russia from the Byzantine period and the fall of Constantinople to the present day. Emphasis on the relations between church and state in various periods and on the influence of Eastern Christianity on the cultures of the traditional Eastern Orthodox nations.

HIST 306 History of Religion in America (3) A history of religion, religious movements, and churches in America from the early Colonial period to the present, with special attention to the religious development of the Unitarian Universalist church.

HIST 307 The Holocaust of European Jewry (3) Also offered as JSTW 345. Credit will be granted for only one of the following: HIST 307 or JSTW 345. Roots of Nazi Jewish policy in the 1930’s and during World War II: the process of destruction and the implementation of the “final solution of the Jewish problem” in Europe, and the responses made by the Jews to their concentration camps and ghettos.

HIST 309 Proseminar in Historical Writing (3) Discussions and research papers designed to acquaint the student with the methods and problems of research and presentation. Students will be expected to evaluate those phases of history which they regard as their specialties.

HIST 312 Crisis and Change in the United States (3) Prerequisite: one course in history. Major historical crises, controversies, and readjustments in the United States.

HIST 313 Crisis and Change in European Society (3) Prerequisite: one course in history. Major historical crises, controversies, and readjustments in European society.

HIST 314 Crisis and Change in the Middle East and Africa (3) Prerequisite: one course in history. Major historical crises, controversies, and readjustments in the Middle East and Africa.

HIST 315 Crisis and Change in East Asia (3) Prerequisite: one course in history. Major historical crises, controversies, and readjustments in East Asia.

HIST 316 Crisis and Change in Latin America (3) Prerequisite: one course in history. Major historical crises, controversies, and readjustments in Latin America.

HIST 317 Special Topics in History (3) Repeatable to 6 credits if content differs.

HIST 320 Early Christianity: Jesus to Constantine (3) Prerequisite: one course in history. From the life and teachings of Jesus to the (3) century. Also offered as JSTW 331. Credit will be granted for only one of the following: HIST 320 or JSTW 331. Social and religious history of early Christendom from its origins in the first century to the reign of Constantine.

HIST 321 Biblical History and Culture (3) Also offered as JSTW 324. Credit will be granted for only one of the following: HIST 321 or JSTW 324. Formerly HEBR 333. Study of the political, social and religious development of the Jewish nation from its inception to its return from exile in Babylonia around 536 C.E. Focus will be on the interaction of textual materials from neighboring cultures to reconstruct political history and the development of religious concepts.

HIST 324 Classical Greece (3) The ancient Greeks from Homer to Socrates. 800-400 B.C. Society and religion of the city-state, the art and literature of Periclean Athens, the Peloponnesian war, and the intellectual circle of Socrates.

HIST 325 Alexander the Great and the Hellenistic Age (3) History of the Greeks 400-30 B.C.: Alexander and the changes he wrought in the Mediterranean world; the rise of monarchies and leagues; new directions in religion, art, literature, and science; and Hellenization of the Near East, including the Jews.

HIST 326 The Roman Republic (3) Ancient Rome 753-44 B.C., from its founding to the assassination of Julius Caesar. Rome’s conquest of the Mediterranean world, its social and political forces which brought it about, and the consequent transformation and decline of the republic.

HIST 327 The Roman Empire (3) Roman history from Augustus to Heraclius, 44 B.C.-A.D. 641. The imperial court and government, the Romanization of the cities and provinces, the progress of Romanization; Roman religion and its transformation in late antiquity; the Roman army and defense of the frontiers.

HIST 330 Europe in the Making: The Early Medieval West (3) From the fall of the Roman Empire to 1000 C.E. Political, social, and cultural developments of the Middle Ages with study of the principal sources of medieval thought and learning, art and architecture and political theory. Recommended as a sequel to HIST 330.

HIST 331 Europe in the High Middle Ages: 1000-1250 (3) Medieval civilization in the 11th through 13th centuries. Emphasis on cultural and political developments of the high Middle Ages with study of the principal sources of medieval thought and learning, art and architecture and political theory. Recommended as a sequel to HIST 330.

HIST 332 Europe During the Renaissance and Reformation I (3) Continental Europe from 1450 to 1650: development and spread of Renaissance culture; growth in the powers of central governments; economic changes and growth; development and decline of overseas colonization; division of Western Christendom into two religious camps. Particular emphasis on the Protestant and Catholic reformations and their consequences for Europe’s geopolitical, social, economic, and cultural development. This course will deal with issues of authority, cultural trends, and the formation of group solidarity.

HIST 333 Europe in the High Middle Ages: 1000-1250 (3) Medieval civilization in the 11th through 13th centuries. Emphasis on cultural and political developments of the high Middle Ages with study of the principal sources of medieval thought and learning, art and architecture and political theory. Recommended as a sequel to HIST 330.

HIST 334 The Age of Absolutism, 1600-1715 (3) Europe in the age of Louis XIV, with emphasis upon social, religious, and cultural developments.

HIST 335 America in the Revolutionary Era, 1763-1815 (3) Also offered as JWST 335. Credit will be granted for only one of the following: HIST 335 or JWST 335. The background and development of Revolution and early nationalhood through the War of 1812. Emphasis on the role of the American people in shaping their new government as citizens, in the development of a new political order, and in the challenges facing the new nation.

HIST 336 America in the World Setting of the 20th Century (3) Also offered as JWST 336. Credit will be granted for only one of the following: HIST 336 or JWST 336. Study of America in the world setting of the 20th century. Major topics include the rise of America as a world power, American involvement in World War II, the Cold War, and the effects of the Cold War on the United States and the world.

HIST 337 America in the Revolutionary Era, 1763-1815 (3) Also offered as JWST 335. Credit will be granted for only one of the following: HIST 335 or JWST 335. The background and development of Revolution and early nationalhood through the War of 1812. Emphasis on the role of the American people in shaping their new government as citizens, in the development of a new political order, and in the challenges facing the new nation.

HIST 338 America in the World Setting of the 20th Century (3) Also offered as JWST 336. Credit will be granted for only one of the following: HIST 336 or JWST 336. Study of America in the world setting of the 20th century. Major topics include the rise of America as a world power, American involvement in World War II, the Cold War, and the effects of the Cold War on the United States and the world.

HIST 339 Social and Cultural History of the United States (3) Also offered as JWST 339. Credit will be granted for only one of the following: HIST 339 or JWST 339. Study of the social and cultural history of the United States from the end of the Civil War to the present. Emphasis on the role of the American people in shaping their new government as citizens, in the development of a new political order, and in the challenges facing the new nation.

HIST 340 Eastern Europe under Communism (3) The evolution of communist regimes and socialist societies in Poland, Czechoslovakia, Hungary, East Germany, Romania and Bulgaria with separate treatment of Yugoslavia. Emphasis on pre-1945 continual and post-1945 change.

HIST 341 History of Anti-Semitism (3) The historical development of anti-Semitism in its European context. Anti-Semitism both as a set of ideas and as a political movement from the ancient era to the present, with emphasis on the modern era.

HIST 342 Fascism: Theory and Practice (3) The origins and historical context of Fascism in Europe and its effects on the politics of western Europe. Also offered as JWST 337. Credit will be granted for only one of the following: HIST 342 or JWST 337. Social, political, economic, and cultural change in the Jewish world since 1650. Focus on anti-Semitism, assimilation, and new forms of Jewish identity in Western and Eastern European Jewry from the 17th to the 20th centuries.
HIST 459 Society in America: Historical Topics (3) Repeatable to 6 credits if content differs. A consideration of selected aspects of American society from colonial times to the present. Special emphasis on regionalism, immigration, nativism, minorities, urbanization, and social responses to technological changes.

HIST 460 History of Labor in the United States (3) The American working class in terms of its composition; its myths and utopias; its social conditions; and its impact on American institutions.

HIST 461 Blacks in American Life: 1865 to Present (3) The role of the Black in America since slavery, with emphasis on 20th-century developments: migration from farm to city; growth of the civil rights movement; the race question as a national problem.

HIST 462 The United States Civil War (3) Causes of the Civil War; sectional politics and secession; resources and strategy of the Confederacy and the Union; changing character of the war; emancipation and its consequences: economic, social, and political conditions on the homefront; and the wartime ors of Reconstruction. Not a military history course; little attention to the tactics of particular battles.

HIST 463 History of the Old South (3) The golden age of the Chesapeake, the institution of slavery, the frontier South, the antebellum plantation society, the development of regional identity and the experiment in independence.

HIST 467 History of Maryland (3) Political, social, and economic history of Maryland from the 17th-century to the present.

HIST 471 History of Brazil (3) The history of Brazil with emphasis on the national period.

HIST 472 History of the Argentine Republic (3) Concentration upon the recent history of Argentina with emphasis on the political and economic development of a Third World nation.

HIST 473 History of the Caribbean (3) Offers a concise introduction to the history of the Caribbean region from the Columbian voyages to the 20th-century. Special emphasis is given to the dynamics of local social and cultural formations within the framework of the political and economic history of the Atlantic world.

HIST 474 History of Mexico and Central America I (3) History of Mexico and Central America, beginning with the Pre-Spanish Indian cultures and continuing through European contact, conquest, and colonial dominance, down to the beginning of the Mexican War for Independence in 1810.

HIST 475 History of Mexico and Central America II (3) A continuation of HIST 474 with emphasis on the political development of the Mexican nation.

HIST 480 History of Traditional China (3) China from earliest times to 1644 with emphasis on the development of traditional Chinese society, culture, and government.

HIST 481 A History of Modern China (3) Modern China from 1644 to the People’s Republic of China. Emphasis on the coming of the West to China and the various stages of the Chinese Revolution.

HIST 482 History of Japan to 1615 (3) The golden age of the 16th century: the Tokugawa shogunate; the development of regional identity and the experiment in independence. The continuation of HIST 474 with emphasis on the political, social and economic development of a Third World nation.

HIST 483 History of Japan Since 1800 (3) Japan’s renewed continental learning down to the rule of military families, the modernization of Japan, the development of a capitalist and technocratic society down to the rule of military families, the modernization of Japan, the development of a capitalist and technocratic society. The constraints of social constructs upon the female authorial voice; contemporary assumptions about women.

HIST 484 History of Japan to 1800 (3) Japanese culture, society, and government. The impact of Islam on social structures, e.g., domestic African slavery. The rise of Islam in resistance movements against imperialism and colonization, and the place of Islam in independence and post-independence movements.

HIST 499 Independent Study (1-3) Prerequisite: permission of department. Repeatable to 6 credits.

HLTH — Health

HLTH 105 Science and Theory of Health (2) The scientific and philosophical bases for various theories of health, including health, wellness, individual control and limitations of health status, and holistic health.

HLTH 106 Drug Use and Abuse (3) An interdisciplinary analysis of contemporary drug issues and problems. The course will examine the biological, psychological, sociological, historical, legal and health aspects of drug use and abuse. Special attention will be focused on those general motivations for drug use that attend life on the college campus.

HLTH 140 Personal and Community Health (3) Meaning and significance of health; social health as reliance on the individual and/or society; important phases of national health problems; constructive methods of promoting health of the individual and the community.

HLTH 150 First Aid and Emergency Medical Services (2) Lecture, demonstration and training in emergency care, including cardiopulmonary resuscitation, hemorrhage control, shock, poisons and bone injury treatment and childbirth.

HLTH 377 Health Education in the Workplace (3) A course designed to provide students with the skills to create these experiences with those from previous methods courses in the development of curricula for health and safety education. The course prepares for student teaching which follows in the same semester. The observations will be made of health programs in junior and senior high schools.

HLTH 371 Communicating Safety and Health (3) The communication and educational aspects of safety and health information. Emphasis on various types of communications and recipient factors which contribute to their success or failure.

HLTH 377 Human Sexuality (3) The biological and developmental aspects of human sexuality; the psychological aspects of sexuality; the history, cultural, social, linguistic, legal and moral forces affecting sexual issues; the importance of communication, understanding and intimacy in interpersonal relationships; and research trends in the area of human sexuality.

HLTH 380 Peer Education: Alcohol and Other Drugs (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: HLTH 106; and permission of department. Peer training dealing with drug information and abuse to facilitate workshops in various outreach locations (dorms, Greek system, classrooms).

HLTH 381 Peer Education: Stress Management (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: HLTH 285; and permission of department. Peer training in different forms of stress management to facilitate workshops in various outreach locations (dorms, Greek system, classes).

HLTH 382 Peer Education: Sexuality and Communication (3) Three hours of lecture and three hours of laboratory per week. Prerequisite: HLTH 377; and permission of department. Peer training in communication and issues of sexuality to facilitate workshops in various outreach locations (dorms, Greek system, classes).

HLTH 383 Peer Education: Reproductive Health (3) Three hours of lecture and three hours of laboratory per week. Prerequisite: HLTH 377; and permission of department. Peer training in methods of birth control, sexually transmitted disease and AIDS education to facilitate workshops in the student Health Center and various outreach locations (dorms, Greek system, classes).

HLTH 389 Topical Investigations (1-3) Repeatable to 6 credits if content differs. Independent study of an individual student or an experimental course in special areas of knowledge not covered by regularly scheduled courses.

HLTH 391 Introduction to Community Health (3) Prerequisites: HLTH 140 and HLTH 230. Broad overview of community health. Health promotion, consumer health, public health, school health, environmental health, preventive medicine, human biology and the health care system are examined. Each area’s contribution to community health is discussed.

HLTH 400 Service Learning in Health Education (3) Prerequisite: permission of department; for HLTH ED majors only. 56 semester hours, junior standing. Application of health education knowledge and skills to serve health education needs in the community. Combines community service with preparation and reflection.

HLTH 420 Methods and Materials in Health Education (3) Prerequisites: HLTH 140 or HLTH 140. The purpose of this course is to present the interrelationships of curriculum planning, methodology and the selection and use of teaching aids and materials. Special problems associated with health teaching are discussed. Students become familiar with a variety of resources as well as with planning for and presenting demonstration lessons.

HLTH 430 Health Education in the Workplace (3) A survey of the role of health education in work settings. Examination of occupational stress, the health dimensions of job satisfaction, and the role of women’s health in the workplace, health education approaches to informing workers and management, and health promotion programs in the workplace.

HLTH 437 Consumer Behavior (3) Prerequisites: PSYC 100; and PSYC 120. Credit will be granted for only one of the following: CNEC 437 or HLTH 437. An application of the behavioral sciences to a study of consumer behavior. Current theories, models and empirical testing findings are explored.

HLTH 450 Health of Children and Youth (3) A study of the health of 5 to 18 year olds. Physical, mental, emotional, and social health. Psychosocial development, diet, exercise, recreation, and the roles of parents and teachers.

HLTH 460 Minority Health (2-6) Repeatable to 6 credits if content differs. An introductory course designed to inform health care providers about the health of U.S. ethnic minority groups and factors placing them at elevated risk for disease and injury. Health education concepts and strategies to reduce disparities between their health status and the health status of the general population.
HLTH 471 Women's Health (3) Also offered as WMST 471. Credit will be granted for only one of the following: HLT 471 or WMST 471. The historical, physiological, psychological, and sociological mechanisms which contribute to women's health. Topics will include health concerns and reproductive health; nutrition, exercise; violence; substance use abuse; and the health of special populations.

HLTH 476 Death Education (3) Examination of the genesis and development of present day death attitudes and behavior by use of a multidisciplinary life cycle approach.

HLTH 485 Ways of Knowing About Human Stress and Tension (3) Prerequisite: HLTH 285. Not open to students who have completed HLTH 498T. A critical examination of propositions describing the nature of the human condition and the consequences of the propositions on human stress and tension.

HLTH 486 Stress and the Healthy Mind (3) Prerequisite: HLTH 285. For HLTH majors only. Explores diverse mental health and related behavioral skills as needed by health educators that: facilitate coping with stress, are preventive in nature, and are suitable for learning by healthy individuals in educational settings.

HLTH 487 Adult Health and Developmental Program (3) Training and experience in a clinically oriented development program for the aged.

HLTH 489 Field Laboratory Projects and Workshop (1-6) Note: the maximum total number of credits that may be earned toward any degree in kinesiology, recreation, or health education under KNES, REC, or HLTH 489 is six. The course is designed to meet the needs of persons in the field with respect to workshop and research projects in special areas of knowledge not covered by regularly-structured courses.

HLTH 490 Principles and Techniques of Community Health (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: HLTH 391. Students will be involved in the applied aspects of community health education. They will work with specific local community groups, planning, developing, implementing, and evaluating a community health project. Health agencies and community health marketing techniques will be investigated.

HLTH 491 Community Health Internship (12) 40 hours of laboratory per week. Prerequisite: HLTH 490. For community health majors only. Integrating theory with practice in a community health setting.

HLTH 498 Special Topics in Health (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Topics of special interest in areas not covered by regularly scheduled courses.

HONR — Honors

HONR 100 Honors Colloquium (1) Prerequisite: permission of University Honors Program. Attendance at various additional activities and events is required. Reading and discussion on the personal and social value of higher education; development of a cohort program; exploration of the educational and cultural resources of the campus and metropolitan area; participation in a community service project; and other activities designed to broaden students' conception of what it means to be an educated person.

HONR 149 Honors Colloquium (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A colloquium on a variety of topics.

HONR 168 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 169 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 200 Honors Research Colloquium (1) Prerequisite: permission of University Honors Program. Recommended for students in their second semester. All others should meet with the Honors Advisor. Introduction to scholarly research through readings and meetings with faculty from various disciplines. Exploration of research methods and some of the problems encountered in research; discussion of the creative process; attendance at scholarly lectures; and other activities designed to prepare students to enter college or department/who honors programs.

HONR 218 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 219 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 228 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 229 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 238 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 239 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 248 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 249 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 258 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 259 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 268 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 269 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 278 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 279 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 288 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 289 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 298 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 299 Honors Seminar (1-3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs.

HONR 318 Advanced Honors Seminar (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary in character, and sometimes team taught. The subjects will vary from semester to semester.

HONR 328 Advanced Honors Seminar (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary in character, and sometimes team taught. The subjects will vary from semester to semester.

HONR 338 Advanced Honors Seminar (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary and sometimes team taught. The subjects will vary from semester to semester.

HONR 348 Advanced Honors Seminar (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary and sometimes team taught. The subjects will vary from semester to semester.

HONR 349 Honors Colloquium (1-3) Prerequisite: University or department Honors student or permission of instructor or the Director of University Honors. Repeatable to 3 credits if content differs. A series of seminars, often interdisciplinary and sometimes team taught. Subjects may vary.

HONR 358 Honors Practicum (3) Prerequisite: permission of University Honors Program. Repeatable to 8 credits if content differs. Formerly HONR 379. For student section leaders of HONR 100 or HONR 200.

HONR 359 Honors Workshop (1-6) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. Honors workshops are small seminar classes which concentrate on skill development.

HONR 368 Advanced Seminar (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary in character and sometimes team taught. The subjects will vary from semester to semester.

HONR 378 Advanced Seminar (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary in character and sometimes team taught. The subjects will vary from semester to semester.

HONR 379 Honors Independent Study (1-6) Prerequisite: permission of University Honors Program. Repeatable to 6 credits if content differs. Involved in original research directed by individual faculty, especially in areas outside of the student's major. Open only to University Honors students.

HONR 388 Honors Thesis or Project (3-6) Repeatable to 6 credits if content differs. Formerly HONR 370.

HONR 389 Guided Honors Teaching (3) Prerequisite: permission of University Honors Program. Repeatable to 9 credits if content differs. For HONR 100 and HONR 200 section leaders. Guided teaching experience for selected students in the University Honors Program.

HORT — Horticulture & Landscape Architecture

HORT 100 Introduction to Horticulture (4) Two hours of lecture, two hours of laboratory, and one hour of discussion/recitation per week. An overview to the art and science of horticulture. Relationships between plant science and plant production, the use of horticultural plants and plant stress as influenced by cultural practices.

HORT 140 Pre- or corequisite: LARC 160. Integration of computer, photographic, and plant information systems, focusing on computer database management. The course is designed to meet the needs of persons in the field with respect to workshop and research projects in special areas of knowledge not covered by regularly-structured courses.

HORT 141 Graphic Application for Landscape Management (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: BSCI 226 or HORT 250 or HORT 100. Formerly HORT 453. A field and laboratory study of trees, shrubs, and vines used in ornamental plantings. Major emphasis is placed on plant identification.

HORT 201 Landscape Surveying I (2) One hour of lecture and two hours of laboratory per week. For HORT majors only. Understanding the principles of land surveying such as measurements of distance, elevation and angles, instrument calibration, and mapping.

HORT 240 Management of Horticulrual Crops (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: HORT 200. Repeatable to 9 credits if content differs. A series of seminars, often interdisciplinary and sometimes team taught. The subjects will vary from semester to semester.

HORT 241 Child Development (3) Three hours of lecture and two hours of laboratory per week. Prerequisite: HORT 250 or HORT 100. Formerly HORT 454. A field and laboratory study of trees, shrubs, and vines used in ornamental plantings. Major emphasis is placed on plant identification.

HORT 255 Landscape Design and Implementation (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: HORT 250 or HORT 254. Not open to HORT students who have completed LARC 141 and LARC 341. Principles of landscape architecture applied to residential and commercial landscaping: informal and formal designs and plan graphics.

HORT 261 Computer Applications in Landscape Management (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: HORT 161 and BMGT 220, ECON 203 or AREC 250 or permission of department. Recommended: LARC 141 or LARC 341. Integration of computer, photographic, and other information technologies with the traditional design process including: word processing, design tuth type, Spreadsheets and electronic presentations. Particular emphasis will be placed on programs used in computer-assisted design and in bidding, estimating and valuation in the landscape management industry.

Approved Courses 207
HORT 271 Plant Propagation (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: BSCI 101 and HORT 100. A study of the principles and practices in the propagation of plants.

HORT 320 Principles of Site Engineering (3) One hour of lecture and five hours of laboratory per week. Prerequisites: LARC 201, LARC 202, and HORT 200. For HORT majors only. Also offered as LARC 320. Formerly HORT 364. The study and application of landscape construction principles as applied to grading, drainage, layout and vehicular and pedestrian circulation.

HORT 321 Landscape Structures and Materials (3) One hour of lecture and five hours of laboratory per week. Prerequisite: HORT 320. For HORT majors only. Also offered as LARC 321. Formerly HORT 363. The study and application of the use, properties, and detailing of materials used in landscape construction. The use and design of structures in the landscape.

HORT 388 Honors Thesis Research (3-6) Prerequisite: admission to AGNR Honors Program. Repeatable to 6 credits if content differs. Undergraduate honors thesis research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of Agriculture Honors Program. The thesis will be defended to a faculty committee.

HORT 399 Special Problems in Horticulture (1-3) Prerequisites: 12 credits in HORT and permission of instructor. For NSRC AGRO, and HORT majors only. Repeatable to 6 credits if content differs. Research projects in horticulture including field, greenhouse, laboratory, studio or library research under the direction of a faculty member.

HORT 400 Nursery and Greenhouse Nutrient Management Planning (3) Prerequisites: HORT 208 and HORT 253 or permission of department. Recommended: HORT 456 or HORT 432. Course will be entirely Web-based (delivered at a distance), so internet access and a knowledge of computer operation is required. Course will lead to professional certification by the State of Maryland after MDA examinations are passed. This course will be accessed through the WebCT server on campus. Syllabus and other information can be found at https://www.courses.umd.edu/public/HORT400/.

HORT 423 Greenhouse Crop Production (3) Prerequisite: NSRC 201 (formerly HORT 201) and HORT 202. Prerequisites: BSCI 442. The commercial production and marketing of ornamental plant crops under greenhouse, plastic houses and out-of-door conditions.

HORT 433 Technology of Fruit and Vegetable Production (4) Three hours of lecture and three hours of laboratory per week. Prerequisite: NSRC 201 (formerly HORT 201); HORT 202; HORT 271; and NSRC 411 (formerly AGRO 411); Corequisite: BSCI 442. Recommended: NSRC 200 (formerly AGRO 202). 60 semester hours. Junior standing. Credit will be granted for only one of the following: NSRC 411 (previously AGRO 411), HORT 422, or HORT 433. A critical analysis of research work and application of plant physiology, botany, and horticultural practices to practical problems in the commercial production of fruit and vegetable crops.

HORT 452 Principles of Landscape Establishment and Maintenance (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: HORT 200; HORT 202; and HORT 254. For HORT majors only. Establishment and maintenance of landscape plants, stressing the physiological determinants of recommended practices.

HORT 456 Nursery Crop Production (3) Two lectures a week and four all-day Saturday laboratory periods. Prerequisites: NSRC 201 (formerly HORT 201); HORT 202; and HORT 271. The methods used for producing ornamental plants and an introduction to the different types of commercial nurseries.

HORT 472 Advanced Plant Propagation (2) Prerequisite: NSRC 201 (formerly HORT 201); HORT 202; and HORT 271. A study of the propagation and physiology of the seed and plant as related to macro and micro forms of propagation. A review of research in propagation.

HORT 474 Physiology of Maturation and Storage of Horticultural Crops (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: BSCI 105 or equivalent. The principles of physiological and biochemical changes occurring during storage of horticultural commodities. Application of scientific principles to handling and storage of fresh produce.

HORT 489 Special Topics in Horticulture (1-3) Credit according to level and organization of topic. A lecture and/or laboratory series organized to study in depth a selected phase of horticulture not covered by existing courses.

ITAL — Italian

ITAL 101 Elementary Italian I (4) Credit will be granted for only one of the following: ITAL 101 or ITAL 101L. Introduction to basic grammar and vocabulary; written and oral work.

ITAL 102 Elementary Italian II (4) Prerequisite: ITAL 101 or permission of department. Continuation of study of basic grammar; written and oral work, with increased emphasis on spoken Italian.

ITAL 121 Accelerated Italian I (3) Credit will be granted for only one of the following: ITAL 101I or ITAL 121I. An intensive beginning course in Italian language skills; guided practice in reading, writing, understanding and conversation, to enable the student to move more quickly to advanced courses. Restricted to students already having a good background in at least one other foreign language. With ITAL 122, may be used to satisfy language requirement.

ITAL 122 Accelerated Italian II (3) Prerequisite: ITAL 121I or permission of department. Credit will be granted for only one of the following: ITAL 203 or ITAL 122I. Completion of ITAL 121I. Completion of accelerated cycle. May be used to satisfy language requirement.

ITAL 203 Intermediate Italian (4) Prerequisite: ITAL 102 or permission of department. Credit will be granted for only one of the following: ITAL 203 or ITAL 122. Completion of study of basic grammar; extensive reading, discussion, and composition. Completion of this course fulfills the Arts and Humanities language requirement.

ITAL 204 Review Grammar and Composition (3) Prerequisite: ITAL 203 or ITAL 122I, or permission of department. An intensive review of major aspects of contemporary grammatical usage; training in comprehension; an introduction to guided composition.

ITAL 211 Intermediate Conversation (3) Prerequisite: ITAL 203 or permission of department. Not open to native speakers. Practice in spoken Italian with emphasis on contemporary Italian culture.

ITAL 241 Modern Italian Women Writers — In Translation (3) An analysis of the writings and the ideas of modern Italian women writers.

ITAL 251 Aspects of Contemporary Italian Literature and Culture (3) Prerequisite: ITAL 204 or ITAL 211 or permission of department. Reading of selected literary texts; discussion and brief essays in Italian.

ITAL 261 Cuisine, Culture, and Society in Italy Today (3) Prerequisite: ITAL 204 or permission of department. This course will expose students to an important aspect of Italian culture. The art of gastronomy. Taught entirely in Italian.

ITAL 470. Political, social, intellectual, literary and artistic forces shaping contemporary Italy from the late Middle Ages to the present. In English.

ITAL 472. The Italian Renaissance in Translation (3) Credit will be granted for only one of the following: ITAL 471 or ITAL 472. Formerly ITAL 475. The culture of Italy through the medium of film from the silent days up to the present.

ITAL 474 Cultural Approaches to Translation (3) Formerly HORT 465. An examination of the use, properties, and ±determinants of recommended practices.

ITAL 476 Cultural Approaches to Translation (3) Formerly HORT 465. An examination of the use, properties, and ±determinants of recommended practices.

ITAL 477 The Italian-American Experience (in English) (3) Credit will be granted for only one of the following: ITAL 403 or ITAL 402. A study of the principles and practices in the commercial production of fruit and vegetable crops.

ITAL 478 Special Topics in Italian Literature (3) Repeatable to 6 credits if content differs.

ITAL 479 Special Topics in Italian Studies (3) Repeatable to 6 credits if content differs.

IISP — Individual Studies Program

IISP 237 Progress Report (1) Prerequisite: admission to IISP major. A written analysis of the program. Students register for IISP 317 only once, the semester before the final term.

IISP 316 Independent Learning Activities (1-6) Prerequisites: ITAL 101 or equivalent. Continued introduction to the basic spoken patterns of contemporary Italian.

IISP 317 Independent Learning Activities (1-6) Prerequisites: ITAL 101 or equivalent. Continued introduction to the basic spoken patterns of contemporary Italian.

IISP 318 Independent Learning Activities (1-6) Prerequisites: ITAL 101 or equivalent. Continued introduction to the basic spoken patterns of contemporary Italian.

IISP 426 Senior Paper (3) Prerequisite: admission to IISP major. For IISP majors only. Synthesizing final paper or a final special project.

JAP — Japanese

JAP 101 Elementary Japanese I (6) Introduction to basic spoken and written forms of contemporary Japanese and to the two phonetic syllabaries (Katakana and Hiragana).

JAP 102 Elementary Japanese II (6) Prerequisite: JAP 101 or equivalent. Continued introduction to the basic spoken patterns of contemporary Japanese.

JAP 201 Intermediate Japanese I (6) Prerequisite: JAP 102 or equivalent. Contemporary spoken and written Japanese.

JAP 202 Intermediate Japanese II (6) Prerequisite: JAP 201 or equivalent. Contemporary spoken and written Japanese.
JAPN 217 Japanese Literature in the Age of the Samurai (3) 
Introduces students to the works of medieval Japanese literatures (c. 1200-1850) and to their intellectual and cultural backgrounds, focusing on prose fiction and drama.

JAPN 301 Advanced Japanese I (6) Prerequisite: JAPN 202 or equivalent. Formerly JAPN 305. Advanced conversation, oral comprehension, and selected readings.

JAPN 302 Advanced Japanese II (6) Prerequisite: JAPN 301 or equivalent. Formerly JAPN 306. Continued readings in varied modern texts and advanced conversation and oral comprehension.

JAPN 317 Buddhism and Japanese Literature in Translation (3) Religious and philosophical traditions central to Japanese imaginative life and literature from ancient to modern times.

JAPN 401 Readings in Modern Japanese I (3) Prerequisite: JAPN 302 or equivalent. Development of translation techniques, vocabulary, grammar, and reading speed. Readings in history, social sciences, modern literature, and modern newspaper and periodical literature.

JAPN 402 Readings in Modern Japanese II (3) Prerequisite: JAPN 401 or equivalent. Continuation of more advanced readings.

JAPN 403 Business Japanese I (3) Prerequisite: JAPN 302 or equivalent. Formerly JAPN 303. Conversation, reading, and writing among business, commercial, and social groups. Classes meet in groups with government organizations, with background material in English on professional business practices and social customs associated with business.

JAPN 404 Business Japanese II (3) Prerequisite: JAPN 403 or equivalent. Formerly JAPN 304. Continuation of JAPN 403.

JAPN 405 Readings in Advanced Modern Japanese (3) Prerequisite: JAPN 402 or equivalent or permission of department. Designed to further improve reading and translation skills; the course will include readings from newspaper articles, literary works, and academic publications in the social sciences and humanities. Listening exercises are included.

JAPN 406 Translating Diplomatic Japanese (3) Prerequisite: JAPN 306 and permission of department. Formal, written, diplomatic Japanese to develop practical translation skills and to learn to use the computer as a telecommunications and translation workstation.


JAPN 412 Classical Japanese (3) Prerequisite: JAPN 411. Continuation of JAPN 411 with more advanced classical Japanese.

JAPN 414 Masterpieces of Classical Japanese Literature in Translation (3) Major classics, with focus on philosophical, historical and cultural backgrounds.

JAPN 415 Modern Japanese Fiction in Translation (3) Major themes and literary developments in fiction from the late 19th century to the present. Emphasis on the works of Kawabata, Tanizaki, Mishima, and Abe.

JAPN 416 Japanese Women and Women Writers (3) Fiction and poetry by Japanese women from the Ninth Century to the present. Women’s early role in creating and shaping a variety of literary genres, the silencing of women during the age of the shoguns, and the reemergence of a feminist tradition and women writers in the Twentieth Century.


JAPN 421 History of the Japanese Language (3) Investigation of the origin of the Japanese language, its relationship with other languages, and its development in English.

JAPN 422 Introductory Japanese Linguistics (3) An investigation of Japanese sound patterns and syntax through a comparison with English.

JAPN 499 Directed Study in Japanese (1-3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs.

JOUR — Journalism

JOUR 100 Professional Orientation (1) Not open to students who have completed JOUR 201. Credit will be granted for only one of the following: JOUR 100 or JOUR 101. Formerly JOUR 101. Survey of journalism professions, emphasizing appropriate academic and career development strategies.

JOUR 150 Introduction to Mass Communication (3) Not open to students who have completed JOUR 201. Credit will be granted for only one of the following: JOUR 100 or JOUR 150. Formerly JOUR 100. Survey of the functions and techniques of the media. A focus on the effects of mass communication on society. A survey of recent developments in mass media: television, radio, film, sound recording, books, magazines, and new media technology. Introduction to public relations, advertising and new analysis.

JOUR 198 Survey Apprenticeship (1) Prerequisite: permission of department. For JOUR majors only. Repeatable to 6 credits if content differs. College-trained experience in approved mass-communications organizations and industries.

JOUR 200 Journalism History, Roles and Structures (2) Pre-or corequisite: JOUR 100. For JOUR majors only. Introduction to the study of journalism from the standpoint of media history and sociology.

JOUR 201 News Writing and Reporting I (3) Pre-or corequisite: JOUR 100. Prerequisite: 30 words per minute word processing ability; and grammar competency demonstrated by a score of 52 or higher on the TSWE. Introduction to news for the print and electronic media, development of new concepts: laboratory in news-gathering tools and writing skills.

JOUR 202 News Editing (3) Prerequisite: grade of C or better in JOUR 201. For JOUR majors only. Copy editing, graphic principles and processes.

JOUR 203 New Media (1) One hour of lecture and one hour of laboratory per week. Prerequisite: JOUR 201. Co-requisite: JOUR 202. Preparing textual, audio and video news messages in a traditional deadline atmosphere for digital delivery.

JOUR 300 Journalism Ethics (3) Prerequisite: JOUR 201. Examination of ethical problems in news writing and reporting.

JOUR 320 News Writing and Reporting II: Print (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: JOUR 202 and grade of C or better in JOUR 201. For JOUR majors only. Principles and practices of news reporting: covering news events and other news sources, including creating news story for accuracy, comprehensiveness and interpretation.

JOUR 321 Advanced Reporting: Public Affairs (3) Prerequisite: JOUR 320 or JOUR 360. Advanced training in writing news for publication in specialized areas, particularly city, county, and federal news. Students meet in groups with news sources including newscasters, leading/news reporters and work in Washington, D.C., Ann Arbor, and Baltimore covering news in depth for publication.

JOUR 322 Advanced Reporting: Beats and Investigation (3) Prerequisite: JOUR 320 or JOUR 360. Advanced training and practice in writing, interviewing, beat reporting and investigative techniques. Students meet in weekly seminars and work with metropolitan-area newspapers covering beats and writing stories for publication.

JOUR 323 Advanced News Editing (3) Prerequisite: grade of C or better in JOUR 202. Principles and practices of editing for publication. Copy improvement, headline writing, news photos and cutlines, wire services, copy control and scheduling, page design and layout.

JOUR 324 News Commentary and Critical Writing (3) Prerequisite: JOUR 360. Not open to students who have completed JOUR 326 prior to January 1, 1992. Formerly JOUR 346; and grade of C or better in JOUR 201 and JOUR 202. Expository journalism interpretation and analysis. Editorial and critical writing.

JOUR 325 Reporting from Annapolis and Washington (6) Three hours of laboratory per week. Prerequisite: permission of department. Students report state and federal news for media. Interpretive and documentary news stories.

JOUR 326 Supervised Internship - News Editorial (3) Prerequisites: a grade of C or better in JOUR 201, JOUR 360 and permission of department. Recommended for JOUR 361 for television internship. For JOUR majors only. Supervised internship experience with communication professionals in broadcast news. Relation of academic training to professional experience. Not open to students first matriculating after May 1999.

JOUR 327 Feature Writing (3) Prerequisite: JOUR 320 or JOUR 360. Research and writing feature articles.

JOUR 328 Journalism History, Roles and Structures II (3) Prerequisite: JOUR 201. Formerly JOUR 328. Comprehensive examination of ethical problems in news writing and reporting, with an emphasis on understanding the historical and cultural context of mass-communications organizations and industries. Repeatable to 3 credits. Limited to students who participated in an internship in the previous semester.

JOUR 329 Advanced Television Reporting and Production (3) Prerequisite: JOUR 375 or JOUR 461. Credit will be granted for only one of the following: JOUR 329 or JOUR 485. Production of a daily television new program.

JOUR 351 Advanced Graphics (3) Prerequisite: JOUR 201. For JOUR majors only. Repeatable to 6 credits if content differs. Advanced training and practice in writing and reporting new in one specialized field of interest.

JOUR 360 News Writing and Reporting II: Broadcast (3) Prerequisite: grade of C or better in JOUR 201. Credit will be granted for only one of the following: JOUR 360 or JOUR 372. Credit for only one of the following: JOUR 360 or JOUR 372. Credit will be granted for only one of the following: JOUR 372 or JOUR 481. Formerly JOUR 481. Explanatory journalism technique applied to complex subjects (such as science, economics and large scale social change) for books, magazines and newspaper series.

JOUR 374 Magazine Editing and Production (3) Prerequisites: JOUR 371 and JOUR 373. Principles and techniques of magazine editing and production.

JOUR 397 Professional Seminar (3) Prerequisites: JOUR 320 or JOUR 360. Management of a broadcast station's news operations.

JOUR 398 Science Writing for News Media (3) Prerequisite: JOUR 320 or JOUR 360. Credit will be granted for only one of the following: JOUR 374 or JOUR 461. Formerly JOUR 461. Organization, operation, and administration of the departments of a newsroom: advertising, business-finance, circulation, news-editorial, personnel, production and promotion.

JOUR 399 Independent Study (1-3) Repeatable to 3 credits. Limited to students who participated in an advanced summer internship after their junior year.

JOUR 399 Independent Study (1-3) Repeatable to 3 credits. Individual projects in journalism.
210 Approved Courses

JOUR 400 Law of Public Communication (3) Junior standing. Legal rights and responsibilities of mass media; libel, privacy, copyright, monopoly, contempt, and other aspects of the law applied to mass communication. Previous study of the law not required.

JOUR 410 History of Mass Communication (3) Junior standing. Relationship between news media and government and politics; governmental and political information and persuasion techniques.

JOUR 420 Media Coverage of Government and Politics (3) Junior standing. Formerly JOUR 262. Not open to students who have completed JOUR 260. Junior standing. Prerequisite: JOUR 320 and two hours of laboratory per week. Prerequisite: JOUR 320

JOUR 440 Media Economics (3) Junior standing. Examination of the economics of the news media.

JOUR 450 Mass Media in Society (3) Junior standing. Ethical, moral, political, economic, and social consideration of mass communication.

JOUR 451 Advertising and Society (3) Prerequisites: JOUR 201 and JOUR 202; or permission of department. Junior standing. Focus on the relationship between mass communication and social medicine, economic purposes and latent social effects. Influences of advertising on people, and related issues of ethics and social responsibility.

JOUR 452 Women in the Media (3) Junior standing. Also offered as WMST 452. Credit will be granted for only one of the following: JOUR 452 or WMST 452. Participation and portrayal of women in the mass media from colonial to contemporary times.

JOUR 453 News Coverage of Racial Issues (3) Junior standing. Analysis of news media coverage of issues relating to racial minorities in the United States, with special attention to Hispanics, Asian Americans, African Americans and Native Americans.

JOUR 459 Special Topics in Journalism (1-3) Repeatable to 6 credits if content differs. Issues of special concern and current interest. Open to all students.


JOUR 465 Visual Communication (3) Prerequisite: JOUR 201. Junior standing. Practical and theoretical examination of visual communication processes related to photography, layout, and design, video and Web information products.

JOUR 466 Theory of Broadcast Journalism (3) Prerequisite: JOUR 201. Junior standing. Analysis of principles that have complete JOUR 365. Credit will be granted for only one of the following: JOUR 365 or JOUR 466. Formerly JOUR 365. Descriptive and critical analysis of broadcast news practices; evaluation of news judgment, formatting and organizing aspects of the broadcast news industry.

JOUR 467 Technology and the Media (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: JOUR 320 or JOUR 360. Recommended: JOUR 352. Exploration of the role of information technology in social change.

JOUR 470 Journalism and Public Communication Research (3) Prerequisite: A university statistics course; students are encouraged to have completed the theory and technique courses in their major sequence. Not open to students who have completed JOUR 477. Credit will be granted for only one of the following: JOUR 470 or JOUR 477. Formerly JOUR 477. Journalistic research methods used in measuring public opinion and media programs and materials.

JOUR 471 Public Opinion Research (3) Prerequisite: A University Statistics Course. Measurement of public opinion and media habits; role of the media in the formation of public opinion.

JOUR 472 Computer-Assisted Reporting (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: JOUR 320 or JOUR 360. Not open to students who have completed JOUR 328. Credit will be granted for only one of the following: JOUR 320 or JOUR 472. Formerly JOUR 328. Computer and online data acquisition; analytical methods for writing and reporting news.

JOUR 479 Special Topics in Data Gathering and Analysis (1-3) Prerequisite: JOUR 320 or JOUR 360. Repeatable to 3 credits. Special research topics for reporting and writing.

JOUR 487 Literary Journalism (3) Pre- or co-requisite: JOUR 201 or University Writing course equivalent. Analysis of the dramatic structure in modern newspaper series, magazine pieces and books. Analysis, researching and writing of nonfiction stories, usually with a focus on a specialized area chosen by the student.

JOUR 492 Typography and Layout For Student Publications (3) Type design, family, graphics, art, photography, and editorial and advertisement layout of school newspapers, yearbooks, and magazines.

JOUR 493 Advanced Techniques For Student Publication Advisors (3) Interpretative and investigative reporting; interviewing and scientific survey methods; curriculum and courses for high school and community colleges; textbooks, teaching units, state of the art techniques and resources aid.

JOUR 494 Yearbook Short Course (1) Prerequisite: JOUR 201 or permission of department. Formerly offered as JOUR 260. Required readings and assignments toward the completion of the major in journalism. Intensive course dealing with the theme, content, copy, design, advertising, budget, finance, law and ethics of yearbook development and production.

JOUR 498 Topics in Scholastic Journalism (1-3) Repeatable if content differs. Seminars on specialized areas on the practice of scholastic journalism.

JWST 117 The Modern Jewish Experience Through Literature (3)

JWST 227 Reconstructing the Civilization of Ancient Mesopotamia (3) Also offered as HIST 226. Credit will be granted for only one of the following: JWST 227 or HIST 226. Formerly HEBR 440. History and culture of Ancient Mesopotamia, as reconstructed from archeology, language, and texts of the region. Emphasis on culture, literature, religion, and institutions.

JWST 230 Introduction to the Rabbinc Movement: History and Culture (3) Also offered as HIST 281. Credit will be granted for only one of the following: JWST 230 or HIST 281. The emergence of the Rabbinc movement after the destruction of the Temple in 70 CE through the 7th Century CE. The essential texts of ancient rabbinc literature.

JWST 234 History of the Jewish People I (3) Also offered as HIST 324. Credit will be granted for only one of the following: JWST 234 or HIST 324. The study of Jewish history from the end of the Middle Ages to the present. Special attention to the emergence of Rabbinc Judaism and its subsequent encounter with medieval Christian and Islamic civilizations.

JWST 235 History of the Jewish People II (3) Also offered as HIST 235. Credit will be granted for only one of the following: JWST 235 or HIST 235. Political, economic, social and cultural development within Jewish history from the middle of the Middle Ages to the present. Special attention to the twelfth century development of Jewish culture and its aftermath, as well as the Zionist movement and the creation of the State of Israel, and the rise of the renaissance of Jewish studies which they regard as their specialties.

JWST 239 Research Seminar in Jewish Studies (3) Prerequisite: Two upper level (JWST or permission of department). Junior standing. Repeatable to 6 credits if content differs. Discussions and research papers designed to acquaint students with the methods and problems of research and presentation. Students will be encouraged to examine those phases of Jewish studies which they regard as their specialties.

JWST 281 Yiddish I (3) Also offered as GER 148Y. Open to students who have completed GER 148Y. Introduction to the Yiddish language, with emphasis on speaking, reading, and writing skills. Students will also learn the history of the language, its significance to Jewish culture, its origins and basic structure.

JWST 282 Elementary Yiddish II (3) Prerequisite: JOUR 281 or GER 148Y or permission of department. Also offered as GER 149Y. Open to students who have completed GER 149Y. Continuation of JWST 281.

JWST 309 Research Seminar in Jewish Studies (3) Junior standing. Analysis of two upper level (JWST or permission of department) junior standing. Repeatable to 6 credits if content differs. Special attention to the rise of sectarian and revolution movements.

JWST 324 Biblical History and Culture (3) Also offered as HIST 324. Credit will be granted for only one of the following: JWST 324 or HIST 324. Formerly HEBR 324. Study of the political, social, and religious development of the Jewish nation from its inception to its return from exile in Babylonia around 536 C.E. Focus on biblical texts, archeological finds, and source materials from neighboring political history and the development of religious concepts.

JWST 325 Jews and Judaism in Antiquity I: Sixth Century BCE through the Roman Period (3) Also offered as HIST 370. Credit will be granted for only one of the following: JWST 325 or HIST 370. Political, social and religious history of the Jews from the Persian Period to the Judean Revolt of 66-70CE. Special attention to the rise of sectarian and revolution movements.

JWST 326 Jews and Judaism in Antiquity II: First through Second Centuries C.E. Also offered as HIST 371. Credit will be granted for only one of the following: JWST 326 or HIST 371. Political, social, and religious history of the Jews from the destruction of the Jerusalem Temple in 70 CE to the beginning of Muslim conquests. Special attention to the political transformations in Judaism under late Roman Christianity, and the rise of the Rabbinc movement.

JWST 331 Early Christianity: Jesus to Constantine (3) Also offered as HIST 331. Credit will be granted for only one of the following: JWST 331 or HIST 331. Social and religious history of the Christian nation from its origin in the first century to the reign of Constantine.
JWST 342 History of Zionism and the State of Israel (3) Also offered as PHIL 433. Credit will be granted for only one of the following: JWST 342 or HIST 376. Ideological and political factors leading to the establishment of a secular Jewish state in 1948, and the social, economic, religious, and political developments and transformations since then. Prerequisite: three credits in Philosophy or permission of department.

JWST 343 Modern Jewish History I: The Road to Emanicipation, 1560-1870 (3) Also offered as HIST 374. Credit will be granted for only one of the following: JWST 343 or HIST 374. Social, political, economic, and cultural change in the Jewish world since 1650. Emphasis on emancipation, assimilation, and new forms of Jewish identity in Western and Eastern European Jewry from the 17th to the 20th centuries. Prerequisite: three credits in Philosophy or permission of department.

JWST 344 Modern Jewish History II: World Jewry Since 1870 (3) Also offered as HIST 375. Credit will be granted for only one of the following: JWST 344 or HIST 375. Continuation of JWST 344 on the economic, political, and cultural developments of the Jewish world since 1870. Emphasis on emancipation, assimilation, and new forms of Jewish identity in Western and Eastern European Jewry from the 19th Century to the present. Prerequisite: three credits in Philosophy or permission of department.

JWST 345 The Holocaust of European Jewry (3) Also offered as HIST 307. Credit will be granted for only one of the following: JWST 345 or HIST 307. Roots of Nazi Jewish policy in the 1930's and during World War II: the process of destruction and the impact of the "final solution." Credit will not be given for both JWST 345 or JWST 451. Formerly HIST 451. Emphasis on the Holocaust and the role of American Jewry in responding to the tragedy caused by the behavior of the Nazis.

JWST 419 Special Topics in Jewish Studies (3) Repeatable to 8 credits if content differs. Credit will be granted for only one of the following: JWST 419 or JWST 420. Prerequisite: three credits in Philosophy or permission of department. Also offered as PHIL 443. Not open to students who have completed PHIL 433 or HEBR 451. Credit will be granted for only one of the following: JWST 419 or JWST 451 or HEBR 451. Formerly HEBR 451. Historical and legal aspects of the Holocaust; the Holocaust and the role of the Jewish community; and the political and philosophical implications of the Holocaust on Jewish life.

JWST 451 Issues in Jewish Ethics and Law (3) Prerequisite: three credits in Philosophy or permission of department. Credit will be granted for only one of the following: JWST 451 or HEBR 451. Credit will be granted for only one of the following: JWST 451 or HEBR 451 or PHIL 433. Formerly PHIL 433. Not open to students who have completed PHIL 433 or HEBR 451. Credit will be granted for only one of the following: JWST 451 or HEBR 451. Formerly HEBR 451. Jewish ethical and legal theories and their application to modern issues.

JWST 453 Philosophy of Spinoza (3) Prerequisite: six credits in Philosophy or permission of department. Also offered as PHIL 424. Not open to students who have completed PHIL 424. Credit will be granted for only one of the following: JWST 453 or PHIL 424. An introduction to the philosophy of Spinoza, focusing on his views on God, nature, and human freedom.

JWST 466 Readings in Hebrew Hebrew (3) Prerequisite: HEBR 272. Credit will be granted for only one of the following: HEBR 466. Formerly HEBR 467. Emphasis on advanced reading in Biblical Hebrew texts. Language of instruction: English; all texts in Hebrew.

JWST 468 Readings in the Hebrew Bible (3) Prerequisite: HEBR 212 or equivalent. Formerly HEBR 441 and HEBR 442. Credit will be granted for only one of the following: HEBR 468. Formerly HEBR 442. Readings in the Hebrew text of the Bible. Emphasis in close reading, grammar analysis, and modern interpretations of the Bible. Language of instruction: English; all texts in Hebrew.

JWST 469 Readings in Rabbinic Hebrew (3) Prerequisite: HEBR 272. Credit will be granted for only one of the following: HEBR 469 or JWST 469. Introductory readings in Mishnaic and Talmudic Hebrew texts. Language of instruction: English; all texts in Hebrew.

KINES — Kinesiology

KINES Activities Program Courses: 13 credits per course

KINES 100—179 Physical Education Activities

KINES Professional Program Courses:

KINES 180 Foundations of Physical Education (2) Introduction to the study of physical education with attention to the foundations of educational philosophy and principles to class organization and techniques of teaching physical education.

KINES 182 Rhythmic Activities (2) Six hours of laboratory per week. Development of rhythmic sensitivity through analysis of posture and movement coordination, and its application in the classroom and social dance and teaching techniques for use in schools and recreational programs.

KINES 285 Movement Concepts for Elementary School Children (3) Participation in movement activities with a focus on educational dance, gymnastics and games. Observation and analysis of movement behavior in relation to specific aspects of movement. Examination of relationships among the various components of movement.

KINES 200 Gymnastics Skills Laboratory (2) Progressive techniques of teaching and practice of skills in gymnastics.

KINES 202 Badminton Skills Laboratory (1) Progressive techniques of teaching and practice of skills in badminton.

KINES 204 Basketball Skills Laboratory (1) Progressive techniques of teaching and practice of skills in basketball.

KINES 210 Field Games Skills Laboratory (1) Progressive techniques of teaching and practice of skills in soccer, field hockey, and lacrosse.

KINES 217 Tennis Skills Laboratory (1) Progressive techniques of teaching and practice of skills in tennis.

KINES 218 Laboratory in Teaching (1) Prerequisite: permission of department. Repeatable to 2 credits. Preparation of student for the student teaching experience by assisting in a class.

KINES 220 Track and Field Skills Laboratory (1) Progressive techniques of teaching and practice of skills in track and field.

KINES 221 Volleyball Skills Laboratory (1) Progressive techniques of teaching and practice of skills in volleyball.

KINES 223 Weight Training and Aerobic Skills Laboratory (2) Not open to students who have completed PHIL 223 or HEBR 223 or KNES 223 or KNES 224. Progressive techniques of teaching and practice of skills in weight training and aerobic activities.

KINES 240 Exploring Cultural Diversity Through Movement (3) Cultural diversity through an analysis of the different meanings and exposure to diversity through the movement of different groups. Topics include: anthropology, cultural diversity, gender, race and ethnicity, social dance and teaching techniques for use in schools.

KINES 250 Foundations of Physical Education (2) Introduction to physical education with attention to the foundations of educational philosophy and principles to class organization and techniques of teaching physical education.

KINES 255 Physical Activity for the Handicapped (3) Handicapped conditions, Federal and State regulations, and energy and physical activity programming for children and youth with disabilities. Special emphasis on assessment and planning of physical activity programs, evaluation strategies of controlling and assessment of physical activity outcomes.

KINES 256 Swimming Pool Management (2) Analysis of the swimming pool manager. The systematic treatment of swimming pool water; swimming pool first aid; and laws pertaining to swimming pool operation. Qualifies the student for a pool operator's license in most Maryland counties.

KINES 340 Theory of Coaching Athletics (2) General theory and practice of coaching selected competitive sports found in secondary schools and community recreation programs.

KINES 350 The Psychology of Sports (3) An exploration of personal factors, including motivation, attention, aggression and emotion, as they affect sports participation and motor skill performance.

KINES 351 Contemporary Issues in American Sport (3) Prerequisite: KINES 287. Seminar/discussion of theoretical and practical issues in contemporary sport.

KINES 360 Physiology of Exercise (3) Two hours of lecture and two hours of laboratory per week. Credit will not be given for both KINES 280 and KINES 281. Formerly KINES 280. An analysis of movement physiology focusing upon anatomy and physiology of the musculoskeletal system. Topics include: principle of exercise, design, and prescription of exercise programs, athletic performance and psychological performance, and energy and nutritional needs of athletes.

KINES 370 Motor Development (3) Motor development across the life span. The developmental sequences of motor skills from birth to old age; neuromaturation of neuromuscular system; analysis of the underlying mechanisms of motor skill development; and correlates of motor development.

KINES 371 Elementary School Physical Education: A Movement Approach (3) Prerequisites: KINES 183 and KINES 370. Formerly KINES 421. An analysis of movement philosophy and theory, focusing upon motor development, motor programming, and affective developmental characteristics in relation to progression and planning of games, educational dance and educational gymnastics for elementary school age children.

KINES 372 Advanced Care and Prevention of Athletic Injuries (3) Prerequisite: BSCI 201 or BSCI 202 or KNES 201. Formerly KNES 422 and KNES 282. Advanced theoretical and practical foundations of the prevention, treatment and rehabilitation of athletically related injuries. This course is required for the student seeking NATA certification.

KINES 385 Motor Control and Learning (3) Physiological and cognitive bases for motor control and their applications to the acquisition of movement skills and understanding of movement disorders. Topics include: neuropsychology, motor control theory, sensory/perceptual processes, perception-action coupling, information processing, memory, attention, individual differences, role of motivation, practice organization and role of feedback.

KINES 389 Topical Investigations (1-3) Repeatable to 6 credits. Independent study by an individual student or a group of students in special areas of knowledge not covered by regularly scheduled courses.

KINES 390 Practicum in Teaching Physical Education (3) Prerequisite: KINES 371. Teaching of children in a physical education setting. Special emphasis on curriculum development, lesson planning, progressions and analysis of student performance.

KINES 398 Honors Seminar (1) One hour of discussion/recitation per week. Prerequisite: participation in honors program. Repeatable to 3 credits. Guided discussion of research topics of current interest.

KINES 399 Honors Thesis (3) Prerequisites: KINES 398B; and completion of all other requirements. Thesis must be defended on the individual basis. Thesis must be defended in the honors seminar.
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KNES 402 Biomechanics of Sport (3) Prerequisite: KNES 300, Mechanics of Movement. A survey of movement analysis, influencing sport techniques. A quantitative, scientific basis for sport analysis with emphasis on the application to numerous sport activities. Evaluation and quantification of the filmed performance of athletes.

KNES 451 Children and Sport: A Psychosocial Perspective (3) Prerequisite: KNES 287 and KNES 350. Examining sport experiences of children and youth from a psychosocial perspective, including the impact of highly structured sports on young athletes and the complex social network of coaches, parents and peers.

KNES 455 Scientific Bases of Athletic Conditioning (3) Prerequisite: KNES 360. An examination of physical fitness and athletic conditioning programs stressing the practical application of exercise physiology theory for enhancing athletic performance. Considerations, strength and power development, nutrition, speed, muscular endurance, environmental considerations and ergogenic aids.

KNES 461 Exercise and Body Composition (3) Prerequisite: KNES 360. Psychological concepts relating body composition factors to exercise and human performance. The scientific basis for the establishment and evaluation of conditioning programs where body composition may play an important role, such as weight training and marathons.

KNES 462 Neural Basis of Human Movement (3) Prerequisites: (BCSI 201; and BCSI 202; and KNES 385) or permission of department. An introduction to the neural substrates which underlie postural and volitional movement. Neuroanatomical and neurophysiological bases of functioning; past and present conceptualizations of motor control and coordination; movement disorders; and maturation of the nervous system.

KNES 466 Graded Exercise Testing (3) Two hours of lecture and three hours of laboratory per week. Prerequisite: KNES 360 or permission of department. Functional and diagnostic examination of the cardiovascular response to graded exercise testing. Emphasis on electrophysiology, mechanisms of arrhythmias, normal electrical activation of the heart, axis termination and the normal 12-lead electrocardiogram.

KNES 470 Seminar For Student Teachers (2) A seminar held concurrently with students teaching in physical education. An intensive examination of current problems and issues in teaching physical education.

KNES 480 Measurement in Physical Education (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: MATH 110 or equivalent. Principles and techniques of measurement in physical education and sport, and the objectives of physical education and in the evaluation of the effectiveness of teaching.

KNES 481 Biophysical Aspects of Human Movement (3) Prerequisites: KNES 300; and KNES 360; and KNES 370; and KNES 388 or permission of department. An investigation of the biophysical basis of human movement.

KNES 482 Socio-behavioral Aspects of Human Movement (3) Prerequisites: KNES 287; and KNES 293; and KNES 350. Derivation, formulation, and application of research in the socio-behavioral aspects of human movement.

KNES 486 Politics and Economics of Organized Contemporary Sport (3) Prerequisite: KNES 287. Interdependence of sport, politics, and economics. The structure, organization, and uses of sport in contemporary societies.

KNES 489 Field Laboratory Projects and Workshop (1-6) Repeatable to 6 credits. Workshops and research projects in special areas of knowledge not covered by regularly structured courses.

KNES 491 The Curriculum in Physical Education (3) Prerequisites: KNES 300, KNES 360, and KNES 371. Curriculum and planning concepts, with emphasis on using valid criteria for the selection of content for physical education programs.

KNES 492 History of the Sportswoman in American Organizations (3) Prerequisite: KNES 293. Also offered as WMST 492. A study of the role of women in organized sports and leisure activities, and the contributions of women in the development of sports. An examination of historical perceptions of women’s roles, responsibilities, and potential and their sporting lives; the effects of gender on sporting participation; and opportunities for women involved in sport organizations.

KNES 496 Quantitative Methods (3) Statistical techniques most frequently used in research pertaining to physical education. Effort is made to provide the student with the necessary skills, and to acquaint him with the interpretations and applications of these techniques.

KNES 497 Independent Studies Seminar (3) Discussions of contemporary issues integral to the discipline, critiquing of research in the student’s area of special interest, completion of a major project where the student will be asked to demonstrate the ability to carry out research oriented towards problem solving and critical writing under faculty direction.

KNES 498 Special Topics in Kinesiology (3) Prerequisite: permission of department. Repeatable when subject matter is different. Topics of special interest in areas not covered by regularly scheduled courses.

KORA — Korean

KORA 101 Elementary Korean I (3) Prerequisite: permission of department. Introduction to the Korean language. Primary emphasis on oral skills, but Hanguel, the Korean alphabet, will also be introduced. For students with no Korean background.

KORA 102 Elementary Korean II (3) Prerequisite: KORA 101 or equivalent. Continued training in elementary spoken and written Korean. Instructor permission required for new students.

KORA 211 Introductory Reading for Speakers of Korean I (3) Not open to students who have completed three or more years of Korean. Introduction to the language skills of students already conversant in Korean; instruction entirely in Korean; reading of simple essays and letters, and language games.

KORA 212 Introductory Reading for Speakers of Korean II (3) Prerequisite: KORA 211. Not open to students who have completed six or more years of Korean schooling. Continuation of KORA 211.

KORA 241 History of the Korean Language (3) The origins of the Korean language and its development from earliest recorded times to the present. The relationship of Korean to other languages. In English.

KORA 242 Introduction to Korean Linguistics (3) An introduction to the sound system and grammatical structure of the modern Korean language; Korean writing and orthography; Korean language and society, with an emphasis on speech styles. In English.

KORA 499 Independent Study Korean I (3) Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Independent study under faculty supervision.

LARC — Landscape Architecture

LARC 140 Graphic Fundamentals (3) One hour of lecture and five hours of laboratory per week. Prerequisite: LARC 100, concurrently. For LARC majors only. Not open to students who have completed EDIT 160. Formerly LARC 150. Basic techniques for graphic communication associated with landscape architecture.

LARC 141 Design Fundamentals (3) One hour of lecture and five hours of laboratory per week. Prerequisite: LARC 140. For LARC majors only. Formerly LARC 161. Fundamentals of basic design focusing on creative problem solving associated with landscape architecture.

LARC 160 Introduction to Landscape Architecture (3) Two hours of lecture and one hour of discussion/recitation per week. History, theory, philosophy and current practice of the profession of landscape architecture. Explores the interactive relationship between humans and their environment by examining people's perceptions of and changing attitude towards the landscape. Examination of how these are related to ecological and cultural influences.

LARC 220 Land Surveying (2) One hour of lecture and two hours of laboratory per week. For LARC majors only. Formerly LARC 200. Principles of land surveying such as measurements of distance, elevation and angles, instrumentation and mapping.

LARC 240 Graphic Communications (3) One hour of lecture and five hours of laboratory per week. Prerequisites: LARC 141 and LARC 261. Formerly LARC 211. An introduction to the use of the computer for communication. Emphasis on the use of the computer for the preparation of plans and maps, drawings, and other visual displays. Formerly LARC 263 History of Landscape Architecture (3) Formerly LARC 263. A survey of landscape architecture history from the ancient Western civilizations to the twentieth century with consideration of parallel developments in the Eastern World, Europe, Africa and the Americas.

LARC 265 Site Analysis and Design (3) Prerequisite: LARC 141 and department, for LARC majors only. Formerly ARCH 460. Principles and methods of site analysis; the influence of landscape character and site features (natural and built) on planning, architecture and landscape architecture.

LARC 320 Principles of Site Engineering (3) One hour of lecture and five hours of laboratory per week. Prerequisites: LARC 220 and LARC 241. For LARC majors only. Also offered as HORT 320. Formerly LARC 364. The study and application of site engineering and site decision making for grading, drainage, layout, vehicular and pedestrian circulation.

LARC 321 Landscape Structures and Materials (3) One hour of lecture and five hours of laboratory per week. Prerequisites: LARC 320 and either LARC 340 or LARC 341. For LARC majors only. Also offered as HORT 321. Former LARC 465. An examination of the use, properties, and detailing of materials used in landscape construction. The use and design of structures in the landscape.

LARC 340 Site Design Studio (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: LARC 241 and (LARC 265 or ARCH 460). For LARC majors only. Formerly LARC 466. An examination of the influence of landscape character and site features on the design and use of landscape structures and landscape architecture through application in the studio setting.

LARC 341 Community Design Studio (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: LARC 241. For LARC majors only. Formerly LARC 468. Focuses on the landscape architect’s role within the community and neighborhood context by utilizing community analysis, user and stakeholder input, masterplan design process, site design, report and writing and presentation.

LARC 388 Honors Thesis Research (3) Prerequisite: admission to AGNR Honors Program. Repeatable to 6 credits if content differs. Undergraduate honors thesis research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of AGNR Honors Program. The thesis will be defended to a faculty committee.

LARC 398 Seminar (1)

LARC 420 Professional Practice (3) Prerequisite: LARC 321. For LARC majors only. Former LARC 467. An introduction to and comparative study of the professional concerns of design firms. Focus on planning, legal, ethical, marketing and management considerations of interdisciplinary practices.

LARC 440 Urban Studio Design (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: LARC 321, and LARC 341 or LARC 340. Formerly LARC 462. The landscape architect’s role within the interdisciplinary urban design process, focusing on urban site development. Pedestrian, traffic, and water management and the future of sustainable development will be studied.

LARC 450 Environmental Resources (3) Prerequisite: NRSC200 or permission of department. A review of ecosystems and an examination of planning strategies for preservation, conservation, management and development of sensitive natural and cultural landscape resources in the mid-Atlantic region.

LARC 451 Sustainable Communities (3) Explores concepts, strategies and examples of community design which address the needs of a growing population while preserving the environment and its resources.

LARC 470 Landscape Architecture Seminar (3) Prerequisites: LARC 321 and LARC 341. For LARC majors only. A combination of self-directed study, seminar, and lecture formats. An introduction to aspects of research methods, critical analysis, and proposal writing.

LARC 471 Capstone Studio (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: LARC 420 and LARC 440 and LARC 470. For LARC majors only. A study in an aspect of the discipline. The primary goal is the completion of a landscape architectural project that requires the student to submit a final project report and make an oral presentation, which will be open to the university.

LARC 489 Special Topics in Landscape Architecture (1-4) Prerequisite: permission of department. Repeatable to 4 credits if content differs. Credit according to time scheduled and organization of course. A lecture and/or studio course organized as an in depth study of a selected specialization of landscape architecture not covered by existing courses.
MATH 101 Elementary Mathematical Models (3) Prerequisite: MATH 140 or MATH 220. Credit will be granted for only one of the following: MATH 140, MATH 113, MATH 114, MATH 115, MATH 116. Students Majors in Engineering Physics, certain Economics courses, and certain business programs should consult the department for course equivalency. Credit will be allowed for one only: MATH 113, MATH 114, MATH 115, MATH 116. Topics include modeling of deterministic processes. Linear and non-linear models will be analyzed, including ordinary differential equations and the role of computer simulation. Emphasis will be placed on the mathematical tools used to analyze a particular mathematical model. Topics will be drawn from areas such as probability, linear algebra, topology, metric spaces, functions, sequences and continuity. MATH 115 Precalculus (3) Prerequisite: permission of department based on satisfactory score on the mathematics placement exam, or MATH 002 with a grade of C or better. Not open to students who have completed MATH 140 or any MATH or STAT course for which MATH 140 or MATH 220 is a prerequisite. Credit will be granted for only one of the following: MATH 113 or MATH 115. Preparation for MATH 220 or MATH 140. Elementary functions and graphs: Polynomials, rational functions, exponential and logarithmic functions, trigonometric functions. Algebraic techniques preparatory for calculus. MATH 140 Calculus I (4) Prerequisite: permission of department based on 3 1/2 years of college preparatory mathematics (including trigonometry) and a satisfactory score on the mathematics placement exam, or MATH 002 with a grade of C or better, or MATH 113. Not open to students who have completed MATH 140 or any MATH or STAT course for which MATH 140 or MATH 220 is a prerequisite. Credit will be granted for only one of the following: MATH 113 or MATH 115. Preparation for MATH 220 or MATH 140. Elementary functions and graphs: Polynomials, rational functions, exponential and logarithmic functions, trigonometric functions. Algebraic techniques preparatory for calculus. MATH 211 Elementary Calculus I (3) Prerequisite: MATH 113 or MATH 115. Credit will be granted for only one of the following: MATH 113 or MATH 115. Not open to students who have completed MATH 140 or any MATH or STAT course for which MATH 140 or MATH 220 is a prerequisite. Credit will be granted for only one of the following: MATH 140 or MATH 220. This course is intended for students majoring in mathematics, engineering or the physical sciences. Credit will be granted for only one of the following: MATH 141 or MATH 142. An introduction to differentiation and integration. Applications will include maxima and minima, related rates, and volumes of revolution. Other applications will be drawn from the following: polynomial, rational, exponential, and logarithmic functions.
and algorithms of immediate use in computer graphics.

MATH 240 or MATH 461. Topics from projective geometry and
parallel postulate and the inconsistency of the elliptic parallel
modeling through practical experience. Students will work in

MATH 241; and MATH 246; and MATH 240 or MATH
incompleteness and the decision problem.

MATH 445 or MATH 450/CMSC 450. Elementary development

MATH 475 Combinatorics and Graph Theory (3) Prerequisite:
MATH 240 or MATH 241; and MATH 246; and MATH 240; and
transformation of various spaces, with particular attention to
compactness, transformations, homomorphisms; application of
these concepts to various spaces, with particular attention to
the Euclidean plane.

MATH 436 Differential Geometry of Curves and Surfaces I (3)
Prerequisite: MATH 241; and either MATH 240 or MATH 461.
Curves in the plane and Euclidean space, moving frames, surfaces
in Euclidean space, orientability of surfaces; Gaussian and mean
curvature, ruled surfaces, minimal surfaces, special curves on surfaces. "Theorema Egregium"; the intrinsic geometry of surfaces.

MATH 437 Differential Geometry of Curves and Surfaces II (3)
Prerequisite: MATH 436. Differential forms, the Euler characteristic
and the Jordan canonical form. Elementary treatment of Calabi
Yau manifolds. Additional optional topics such as Morse theory, matrix representations of graphs, applications of graph theory to transport networks, matching theory and

MATH 445 or MATH 450/CMSC 450. Elementary development

MATH 478 Selected Topics For Teachers of Mathematics (1-
3) Prerequisite: one year of college mathematics or permission
of department. (This course cannot be used toward the upper
level math requirements for MATH/STAT majors).

METO — Meteorology

METO 123 Causes and Implications of Global Change (3)
Also

MATH 462 Partial Differential Equations for Scientists and
Engineers (3) Prerequisite: MATH 241; and MATH 246. Cite
will be granted for only one of the following: MATH 462 or
MATH 415. Linear spaces and operators, orthogonality, Sturm-
Liouville problems and eigenfunction expansions for ordinary
differential equations. Additional optional topics such as Morse
theory, matrix representations of graphs, applications of graph
to transport networks, matching theory and

global change.

MATH 464 Transform Methods for Scientists and Engineers
(3) Prerequisite: MATH 246. Fourier series, Fourier and Laplace
transforms. Evaluation of the complex inversion integral by the
ingredient functions. Cauchy integral formula. Theory for
application to evaluation of integrals. Conformal mapping.

MATH 472 Methods and Models in Applied Mathematics I (3)
Prerequisites: MATH 241; and eigenfunction expansions for ordinary
differential equations of mathematical physics: solutions using
transforms and separation of variables. Additional topics such as
Bessel functions and calculus of variations.

MATH 473 Methods and Models in Applied Mathematics II
(3) Prerequisite: MATH 472 or permission of department. Also
offered as MATH 473. Credit will be granted for only one of
the following: MATH 472 and MATH 473. Mathematical models
in fluid dynamics and elastodynamics. Linear and nonlinear
partial differential equations, variational characterizations in
eigenvalue problems, numerical algorithms. Additional optional
topics as time permits. Some examples are Hamiltonian systems,
Maxwell’s equations, non-linear programming.

MATH 475 Combinatorics and Graph Theory (3) Prerequisites:
MATH 240; and MATH 241. Also offered as CMSC 475. Credit
will be granted for only one of the following: MATH 475 and
MATH 472. Mathematical models in fluid dynamics and
elastodynamics. Linear and nonlinear partial differential equations, variational characterizations in
eigenvalue problems, numerical algorithms. Additional optional
topics as time permits. Some examples are Hamiltonian systems,
Maxwell’s equations, non-linear programming.

MATH 478 Selected Topics For Teachers of Mathematics (1-
3) Prerequisite: one year of college mathematics or permission
of department. (This course cannot be used toward the upper
level math requirements for MATH/STAT majors).

MATH 498 Selected Topics in Mathematics (1-9) Honors
students register for reading courses under this number. Repeatable
to 9 credits if content differs. Topics of special interest to advanced undergraduate students will be offered
partially occasionally under the general guidance of the departmental
committee on undergraduate studies.

MATH 499 Honors Seminar (2) Prerequisite: permission of
department. Not open to graduate students. Formerly MATH
398. Faculty supervised reports by students on mathematical
literature. Both oral and written presentation on special topics
of current interest.

MEES — Marine-Estuarine-Environmental Sciences

MEES 440 Essentials of Toxicology (2) Prerequisite: BCHM
261 or BCHM 481. Principles involved in the assessment of
responses of organisms to toxic chemicals, including systemic
and organ toxicology, carcinogenesis, teratogenesis, and
consideration of the effects of major groups of toxicanents.

MEES 498 Topics in Marine-Estuarine-Environmental Sciences
(1-4) Lecture and/or laboratory series organized to study
a selected area of marine-estuarine-environmental sciences not
otherwise considered in formal courses.

METO — Meteorology

METO 123 Causes and Implications of Global Change (3) Also
offered as GEOG 123 and GEO 123, and PBIO 123/BCSI 123.
Credit will be granted for only one of GEOG 123, GEO 123,
MEES 123, METO 123, or PBIO 123/BCSI 123. This course offers
a unique experience in integrating physical, chemical, and
ecological, economic, sociological, and political knowledge toward
a better understanding of global change. Review of environmental
factors relating to weather and climate change, acid precipitation,
ozone holes, global warming, and impacts on
biology, agriculture, and human behavior. Study of the natural,
including the resolution method in propositional logic and
Herbrand’s saturation method. Includes the concepts of truth,
interpretation, validity, provability, soundness, completeness, incompleteness, decidability and
semi-decidability.

MATH 452 Introduction to Dynamics and Chaos (3) Prerequisite:
MATH 241; and MATH 246. Also offered as MATH 452.
An introduction to mathematical dynamics and chaos.
Orbits, bifurcations, Cantor sets and horseshoes, symbolic
dynamics, structural stability, bifurcation theory, stable manifolds and
chaos. Includes motivation and historical perspectives, as well
as examples of fundamental maps studied in dynamics and
applications of dynamics.

MATH 456 Cryptography (3) Prerequisite: Two 400-level MATH
courses with permission of department. Also offered as CMSC
456.

MEES 440 Essentials of Toxicology (2) Prerequisite: BCHM
261 or BCHM 481. Principles involved in the assessment of
responses of organisms to toxic chemicals, including systemic
and organ toxicology, carcinogenesis, teratogenesis, and
consideration of the effects of major groups of toxicanents.

MEES 498 Topics in Marine-Estuarine-Environmental Sciences
(1-4) Lecture and/or laboratory series organized to study
a selected area of marine-estuarine-environmental sciences not
otherwise considered in formal courses.
MUSC 127 Vocal Diction: Italian and Spanish (1) Augmentive study. Phonetics and diction for singers of Italian and Spanish vocal literature.

MUSC 128 Sight Reading for Pianists (2) Repeatable to 4 credits. A course to give the piano major an opportunity to develop proficiency in sight reading at the keyboard.

MUSC 129 Ensemble (3) Three hours of laboratory per week. Rehearsal and performance of selected works for small ensemble of instruments, piano, or small vocal groups. After two registrations in MUSC 129, the student will elect MUSC 229 for two additional semesters and MUSC 329 thereafter.

MUSC 130 Survey of Music Literature (3) Three hours of lecture and one hour of laboratory per week. Open to all students except music and music education majors. A study of the principles upon which music is based, and an introduction to the musical repertoire performed in America today.

MUSC 140 Music Fundamentals I (3) Limited to non-music majors. Related skills: notation, scales, intervals, triads, rhythm, form, and basic aural skills.

MUSC 150 Theory of Music I (3) Prerequisite: departmental audition and entrance examination. For MUSC majors only. An introductory theory course. Notation, scales, intervals, vocal literature, voice study. Phonetics and diction for singers of German and one hour of discussion/recreation per week. A historical survey of rock music from about 1950 to the present, with emphasis on pop music as music and pop music as social history.

MUSC 202 Intermediate Class Piano I (2) Four hours of laboratory per week. Prerequisite: MUSC 103 or equivalent piano training. Advanced keyboard techniques. Continuation of skills introduced in MUSC 103. Transposition, modulation, and sight-reading; methods of teaching functional piano.

MUSC 203 Intermediate Class Piano II (2) Four hours of laboratory per week. Prerequisite: MUSC 202 or equivalent piano training. Advanced keyboard techniques. Continuation of skills introduced in MUSC 202. Transposition, modulation, and sight-reading; methods of teaching functional piano. Development of style in playing accompaniments and in playing for community singing. More advanced repertory.

MUSC 205 History of Rock Music, 1950–Present (3) Three hours of discussion/recreation per week. A historical survey of rock music from about 1950 to the present, with emphasis on pop music as music and pop music as social history.

MUSC 215 The Art of the Performer (3) A study of music as re-created and communicated by one or more performers through recital-lecture programs. The soloist, the ensemble performer, the conductor; style, technique, and interpretation; programming and promotion of music and media. Presentations by Department of Music performance faculty, students, and, when possible, visiting artists. Open to non-music majors.

MUSC 217 Class Composition I (2) Prerequisite: MUSC 151 and permission of department. Principles of musical composition and their application to the smaller forms. Original compositions by Department of Music performance faculty, students, and, when possible, visiting artists. Open to non-music majors.

MUSC 218 Class Composition II (2) Prerequisite: MUSC 217 and permission of department. Continuation of MUSC 217. May be repeated for credit, but only one successful attempt may be applied towards baccalaureate degree requirements.


MUSC 227 Vocal Diction: German (1) Augmentive study. Phonetics and diction for singers of German vocal literature.

MUSC 228 Accompanying For Pianist (2) Prerequisite: MUSC 228. Required of all piano majors and non-music majors (by audition). Operatic production and performance, performance techniques and coaching, stage direction, set and costume design, musical direction. This course will fulfill the requirement for working with smaller operatic works, excerpts, or scenes.

MUSC 230 History of Music I (3) Prerequisite: MUSC 250 or equivalent. A historical study of western music from Corelli through Beethoven.

MUSC 248 Selected Topics in Music (1-3) Prerequisite: permission of School of Music. A maximum of three credits may be applied to the major requirements. Repeatable to 6 credits if content differs. Designed to allow a student of theory or music history to pursue a specialized topic or project under the supervision of a faculty member.

MUSC 250 Advanced Theory of Music I (4) Prerequisite: MUSC 151 with a minimum grade of C. A continuation of MUSC 151, with further study of chromatic and modulatory techniques of the nineteenth century. Emphasis on sight singing, ear training, analysis, and compositional skills.

MUSC 251 Advanced Theory of Music II (4) Prerequisite: a grade of C or better in MUSC 250. A continuation of MUSC 250, concentrating on late nineteenth-century chromatic harmony, analysis of homophony and polyphony, and harmony. Emphasis on sight singing, ear training, analysis, and compositional skills.

MUSC 252 Chamber Music Performance for Pianists (2) Repeatable to 4 credits. A course to give the piano major the opportunity to experience playing in chamber ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 229, the student will elect MUSC 229 for two additional semesters and MUSC 329 thereafter.

MUSC 328 Chamber Music Performance for Pianists (2) Repeatable to 4 credits. A course to give the piano major the opportunity to experience playing in chamber ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 129, the student will elect MUSC 229 for two additional semesters and MUSC 329 thereafter.

MUSC 330 History of Music II (3) Prerequisite: MUSC 250 or equivalent. A historical study of western music from Corelli through Beethoven.

MUSC 331 History of Music II (3) Prerequisite: MUSC 230 and MUSC 328. An introduction to the operatic literature of the eighteenth century through the Baroque era. Repertory: early music, compositions for unusual performing media, works which demand reconstruction of their original circumstances of performance. Outcome of a semester's work may be one or more performances for the public.

MUSC 341 Music Literature Survey I (3) Prerequisite: MUSC 130 or equivalent. A historical study of the operatic literature included in the MUSC 101 and MUSC 102 music-theory courses; in addition, literature not included in the course, but related to music written in the period 1400–1650. The fundamentals of music theory and practice, related to performance. Repeatable to 4 credits. A course to give the piano major the opportunity to experience playing in chamber ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 129, the student will elect MUSC 229 for two additional semesters and MUSC 329 thereafter.

MUSC 344 Solo Vocal Literature (3) Prerequisite: permission of School of Music. The study of solo vocal literature from the Baroque Cantata to the Art Song of the present. The study of the style, technique, and interpretation of the major works of vocal music, and the orchestral song examined.

MUSC 345 Survey of the Opera (3) Prerequisite: MUSC 330, MUSC 331 or equivalent. A study of the music, libretti and composers of the standard operas.

MUSC 348 Selected Topics in Music (1-3) Prerequisite: permission of School of Music. A maximum of three credits may be applied to the major requirements. Repeatable to 6 credits if content differs.

MUSC 350 Musical Form (3) Prerequisite: MUSC 251. A study of the principles of organization in music with emphasis on eighteenth and nineteenth century European music. Reading and analysis of scores exemplifying the musical forms.

MUSC 351 Analysis of Music (3) Prerequisite: MUSC 450 or permission of department. An advanced course in the analysis of traditional music. Theoretical analysis of the music and performance of various musical styles, including the music of the Baroque, Classical, and Romantic eras.

MUSC 352 Keyboard Harmony (2) Prerequisite: MUSC 251. Keyboard performance of musical scores for vocal and instrumental ensembles and keyboard realization of basso continuo parts.

MUSC 355 Theory of Jazz (3) Prerequisite: MUSC 250 or permission of department. A study of the style and practice of playing jazz harmony and comping techniques. Analysis of chord transcriptions applied to the creation of small group arrangements of “standard” tunes.

MUSC 357 Electronic Music Composition (2) Prerequisite: MUSC 250 and permission of department. Theory and practice of music synthesis and control; electromagnetic sound, and its modulation in the voltage-controlled studio.
MUSC 493 Keyboard Music II (3) repertory which are encountered in performance and teaching instrumental baton techniques.

MUSC 490 Conducting (2) characteristics of the instruments and their color possibilities.

MUSC 485 Music in the 20th Century (3) music from 1820 to 1900.

MUSP 402, 403 Senior Courses. assigned independent practice.

MUSP 499 Minor Series: 2 or 4 credits each course. Prerequisites: permission of department chairperson. Limited to majors in music programs other than performance and composition. Each course in the series is 4 credits. One-hour private lesson per week plus assigned independent practice. Courses 109, 208, and 409 may be repeated once for credit, but only one successful attempt in each course may be applied towards baccalaureate degree requirements.

MUSP 109, 110, Freshman Courses.

MUSP 207, 208 Sophomore Courses.

MUSP 305, 306 Junior Courses.

MUSP 409, 410 Senior Courses. Recital required in MUSP 410.

Major Series: 2 or 4 credits each course. Prerequisites: departmental audition, entrance examination, and permission of department chairperson. Limited to majors in performance and composition. Each course in the series must be taken in sequence. The initial election for all new students, both freshman and transfer, is 109. Transfer students are evaluated for higher placement after one semester of study. One-hour private lesson per week plus assigned independent practice. Courses 109, 208, and 409 may be repeated once for credit, but only one successful attempt in each course may be applied towards baccalaureate degree requirements.

MUSP 119, 120 Freshman Courses.

MUSP 217, 218 Sophomore Courses.

MUSP 315, 316 Junior Courses.

MUSP 419, 420 Senior Courses. Recital required in MUSP 420. Instrument designation: each student taking a music performance course must indicate the instrument chosen by adding a suffix to the proper course number, such as: MUSP 102A music—piano; B—violin; C—viola; D—cello; E—bass; F—flute; G—oboe; I—clarinet; J—bassoon; K—saxophone; L—horn; M—trumpet; N—trombone; O—cornet; P—percussion; Q—composition; U—world instruments; V—harp; W—electronic composition; X—hist inst - keyboard; Y—hist inst - strings; Z—hist inst - winds.

NFSC — Nutrition and Food Science

The following courses may involve the use of animals. Students who are concerned about the use of animals in teaching have the responsibility to contact the instructor as soon as they are enrolled in a course to determine whether animals are to be used in the course, whether class exercises involving animals are optional or required and what alternatives, if any, are available.

NFSC 100 Elements of Nutrition (3) Formerly NUTR 100. Fundamentals of nutrition. Nutrient requirements related to changing individual and family needs.

NFSC 112 Food: Science and Technology (3) Two hours of lecture and one hour of discussion/recitation per week. Introduction to the realm of food science, food technology and food processing. It provides an overview of the largest industry in the U.S. with emphasis on the science of food and the technology of food preservation from harvest through processing and packaging to distribution and consumer utilization.

NFSC 250 Science of Food (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: NFSC 112; and CHEM 103; and CHEM 113; permission of department. For NFSC majors only. Formerly FOOD 250. Composition and structure of food with emphasis on chemical, physical, and biological properties, as well as quality characteristics of food products. Food preparers will lab emphasis on the experimental study of food.

NFSC 315 Nutrition During the Life Cycle (3) Prerequisite: NFSC 100 or NFSC 200. Formerly NUTR 315. A study of how development throughout life, including prenatal development, pre- and postnatal growth, and aging, alter nutrient requirements. Students will apply this knowledge to the dietary needs and food choices of these different groups.

NFSC 335 History of Nutrition (3) Prerequisite: course in basic nutrition. Formerly NUTR 335. The development of knowledge in nutrition, including the biographies of creative nutrition researchers and the nature of the discovery process. The use of hypotheses to focus exploration and the testing and evaluation of important hypotheses in nutrition.

NFSC 350 Foodservice Operations (5) Three hours of lecture and 3 hours of laboratory per week. Formerly MIOX 350. Pre- or corequisite: MICB 220. Corequisite: BMGT 364. For Dietetics majors only. Formerly FSAD 350. Introduction to management of labor and personnel, responsibilities in quantity food production and purchasing in a foodservice operation. Laboratory experience in planning, preparation, and service of meals which meet the nutritional needs of the consumer.

NFSC 380 Methods of Nutritional Assessment (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: NFSC 241 and NFSC 243. Responsibilities in quantity food production and purchasing in a foodservice operation. Laboratory experience in planning, preparation, and service of meals which meet the nutritional needs of the consumer.

NFSC 381 Honors Thesis Research (3-6) Prerequisite: admission to AGNR Honors Program. Repeatable to 6 credits if content differs. Undergraduate honors thesis research conducted under the direction of an AGNR faculty member. May be repeated in partial fulfillment of the requirements of the College of AGNR Honors Program. The thesis will be defended to a faculty committee.

NFSC 398 Seminar (1) Formerly FDSC 398. Presentation and discussion of current literature and research in food science.

NFSC 399 Special Problems in Food Science (1-3) Formerly FDSC 399. Designed for advanced undergraduates. Specific problems in food science will be assigned.

NFSC 403 Medicinal and Poisonous Plants (2) Prerequisites: BIOL 105 and CHEM 104. A study of plants important to humans that have medicinal or poisonous properties. Emphasis on the plant source, plant description, the active agent and its beneficial or detrimental physiological and effects.

NFSC 412 Food Processing Technology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: CHEM 243; and NFSC 431; and NFSC 434; and ENEB 414. Co-requirements: NFSC 421 and NFSC 423. A study of the major industrial modes of food processing. It integrates aspects of the biology, microbiology, biochemistry and engineering disciplines as they relate to food processing technology and food science.

NFSC 421 Food Chemistry (3) Prerequisite: BCHM 461. Formerly FDSC 421. Basic chemical and physical concepts are applied to the composition and properties of foods. Emphasis on the relationship of processing technology, to the keeping quality, nutritional value, and acceptability of foods.

NFSC 422 Food Product Research and Development (3) One hour of lecture and four hours of laboratory per week. Prerequisite: permission of department. Senior standing for FDSC majors only. Formerly FDSC 422. A capstone course for FDSC majors. A study of the research and development of new food products. Application of technology, engineering, safety and packaging are integrated by teams of students to develop a new food product from concept to pilot plant scale-up. Students will travel to new food processing plants on 2 to 4 Saturdays during the semester.

NFSC 423 Food Chemistry Laboratory (3) Four hours of laboratory per week. Pr- or corequisite: NFSC 421. Formerly FDSC 423. Analysis of the major and minor components of food using chemical, physical, and instrumental methods in concordance with current food industry and regulatory practices. Laboratory exercises coincide with lecture subjects in NFSC 421.

NFSC 425 International Nutrition (3) Prerequisite: course in basic nutrition. Formerly NUTR 425. Nutritional status of world population; consequences of malnutrition on health and mental development; and local, national, and international programs for nutritional improvement.

NFSC 430 Food Microbiology (2) Prerequisite: MICB 200 or equivalent. Also offered as ANSC 430. Credit will be granted for only one of the following: NFSC 430 or ANSC 430. Formerly BFSD 430. A study of microorganisms of major importance to the food industry with emphasis on foodborne outbreaks, public health significance, bio-processing of foods, disease control, and the microbial spoilage of foods.

NFSC 431 Food Quality Control (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: NFSC 343 or equivalent. Definition and organization of the quality control function in the food industry; preparation of specifications; statistical methods for acceptance sampling; in planta and processing product inspection. Instrumental and sensory methods for evaluating sensory quality, identity and wholesomeness and their integration into grades and standards of quality. Statistical Process Control (SPC).

NFSC 434 Food Microbiology Laboratory (2) Four hours of laboratory per week. Pre- or corequisite: NFSC 430. Also offered as ANSC 434. Credit will be granted for only one of the following: NFSC 434 or ANSC 434. Formerly FDSC 434. A study
of techniques and procedures used in the microbiological examination of foods.

NFSC 440 Advanced Human Nutrition (4) Four hours of lecture per week, Formerly NFSC 100 or NFSC 200; and BSCI 442; and BSCI 440. Formerly NUTR 440. A critical study of physiologic, molecular and metabolic influences on utilization of carbohydrates, proteins, fats, vitamins, minerals, and nonnutritive components of food. Interactions of these nutrients and food components will be examined relative to maintaining health.

NFSC 442 Horticultural Products Processing (3) Two hours of lecture and two hours of laboratory per week. Formerly FDSG 442. Commercial methods of canning, freezing, dehydrating, fermenting, and chemical preservation of fruit and vegetable crops.

NFSC 450 Food and Nutrient Analysis (3) One hour of lecture and four hours of laboratory per week. Prerequisites: NFSC 100 or NFSC 200; and BCHM 461. Formerly NUTR 450. Methods and practices of the analysis of foods and nutrients. It provides an overview of the principles and basic mechanisms used in many of the analytical procedures commonly used in food and nutrition research. Emphasis will be placed on hands-on development of skills necessary to complete each analytical examination of foods.

NFSC 460 Medical Nutrition Therapy (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: NFSC 380 and NFSC 440. Formerly NUTR 460. Modifications of the normal diet appropriate to meet human nutritional needs in acute and metabolic disorders.

NFSC 467 The Computer and the Text: Hypermedia as a Critical Express (3) Theory and practice of multimedia computing. Course analyzes the cultural impact of computing, studies computing computers as a tool to support quality of life. Allows students to create projects in an interactive computer theater environment.

NFSC 468 Practicum in Nutrition (1-6) Prerequisite: permission of department. Repeatable to 6 credits. Formerly NUTR 468. Service training and practical experience in the application of the principles of normal and/or therapeutic nutrition in an approved community agency, clinical facility or nutrition research laboratory.

NFSC 470 Community Nutrition (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: NFSC 100 or NFSC 200; and NFSC 315. Formerly NFSC 470. Perspectives underlying the practice of nutrition services in community settings. Assessment of needs, program planning and evaluation. Programs and strategies to meet nutrition needs outside the acute care setting, such as nutrition education, food assistance. National nutrition policy and federal initiatives in nutrition will be examined. Students will be required to travel to local community nutrition sites during the semester.

NFSC 471 Meat and Meat Processing (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: Formerly FDSG 471. Physical and chemical characteristics of meat and meat products, meat processing processes and product development.

NFSC 482 Seafood Products Processing (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: BCHM 261 or permission of department. Formerly FDSG 482. The principal preservation methods for commercial seafood products with particular reference to the invertebrates. Chemical and microbiological aspects of processing are emphasized.

NFSC 490 Special Problems in Nutrition (2-3) Prerequisites: NFSC 442 and permission of department. Formerly NFSC 490. Individually selected problems in the area of human nutrition.

NFSC 491 Issues and Problems in Dietsetics (3) One hour of lecture and four hours of laboratory per week. Prerequisites: NFSC 350 and NFSC 470. Co-requisite: NFSC 460. For Dietetics majors. A capstone course for dietetics majors. Students will integrate knowledge and theory of nutrition, food, management, psychology, and social behaviors necessary to support quality dietetic practice. Working in teams, students will participate in case studies, simulated situations and community projects. Individual research papers will present cases as well as papers on published research.

NFSC 495 Nutrition Research (3) Eight hours of laboratory and one hour of discussion/recitation per week. Prerequisites: NFSC 440 and BCHM 462; and BIOM 301 or equivalent. Co-requisite: NFSC 468. Principles of scientific method and experimental design. Senior standing. Capstone course for nutritional sciences majors. Students will apply the theories and concepts of nutrition, life sciences and statistics that have been developed in courses in the major. Provides a guided experience in the design, completion, and interpretation of research. Prerequisite: senior standing. Prerequisite: permission of instructor. Repeatable to 6 credits if content differs. Selected current aspects of food.

NRMT 314 Biology and Management of Finfish (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: Formerly AGRI 314. Formerly NUTR 314. Fundamentals of individual and population dynamics; theory and practice of sampling fish populations; management schemes.

NRMT 388 Honors Thesis Research (3-6) Prerequisite: permission of department of the AGNR Honors Program. Repeatable to 6 credits if content differs. Undergraduate honors thesis research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of AGNR Honors Program. The thesis will be defended to a faculty committee.

NRMT 389 Internship (3) Prerequisite: permission of department. Repeatable to 6 credits. Formerly AGRI 389. Students and faculty will evaluate their shared career goals for a minimum of eight hours a week for a semester. Each student must do an in-depth study in some portion of the department and prepare a special project and report related to this study. A student work log is also required. An evaluation from the external supervisor of the project will be required.

NRMT 450 Water Quality: Field and Lab Analysis Methods (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: CHEM 103 and (CHEM 104 or CHEM 113). Formerly as ENBE 451. Credit will be granted for only one of the following: NRMT 450 or ENBE 451. A basic science course that studies the relationship between plant and water quality on ecosystem structure and function.

NRMT 460 Principles of Wildlife Management (3) Three hours of lecture per week. Three Saturday field trips are scheduled. Prerequisites: Formerly NUTR 104. Ecological principles and requirements of wildlife as bases for management, and introduction to the scientific literature. Emphasis on conflicts in wildlife management, government administration of wildlife resources, legislation, and history of the wildlife management profession.

NRMT 461 Urban Wildlife Management (3) Two lectures per week. Two Saturday field trips are scheduled. Ecology and management of wildlife in urban areas. For students in biological sciences, geography, landscape design, natural resources management, recreation and urban studies. Planning, design, and wildlife conservation in landscape ecology. Public attitudes, preferences, and values, reviews of recent scientific literature in the various phases of natural resource sciences, horticulture and agriculture.

NRMT 470 Community Nutrition (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: CHEM 103 or CHEM 113, NRMT 201. Formerly: AGRO 386/HORT 389. Undergraduate honors thesis research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of AGNR Honors Program. The thesis will be defended to a faculty committee.

NRMT 479 Conservation of Natural Resources II (3) Formerly NUTR 479. Designed primarily for teachers. Study of state’s natural resources: soil, water, fisheries, wildlife, forests and minerals; natural resources problems and practices. Extensive field study. Concentration on subject matter. Taken concurrently with NRMT 478. Formerly NRMT 479.

NRMT 497 Conservation of Natural Resources II (3) Formerly NUTR 479. Designed primarily for teachers. Study of state’s natural resources: soil, water, fisheries, wildlife, forests and minerals; natural resources problems and practices. Extensive field study. Concentration on subject matter. Taken concurrently with NRMT 478. Formerly NRMT 479.

NRMT 499 Special Problems (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs.

NRSC — Natural Resource Sciences

NRSC 200 Fundamentals of Soil Science (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: CHEM 103 or permission of department. Not open to students who have completed AGRO 202 or NRSC 200. Credit will be granted for only one of the following: HORT 202 or NRSC 202. Formerly HORT 202. Study and management of soils as natural bodies, media for plant growth, and ecosystem components. Morphology, composition, formation, and conservation of soils. Chemical, biological, and physical properties are discussed in relation to the production of plants, the functioning of hydrologic and nutrient cycles, the protection of environmental quality, and engineering uses of soils.

NRSC 203 Plant Structure and Function (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: HORT 100 or AGRO 101, CHEM 103. Credit will be granted for only one of the following: HORT 203 or NRSC 203. Formerly HORT 203. An overview of the history, genetics, development, and mechanisms for agronomic and horticultural plants that examine mechanisms of genetic improvement ranging from traditional plant breeding to tissue culture and genetic engineering. Social and political issues such as germplasm preservation and international intellectual property rights will also be discussed.

NRSC 389 Internship (1-3) Prerequisite: permission of department. For NRSC HORT, AGRO, and LARC majors only. Formerly: AGRO/HORT 389. Senior standing. Oral presentation of the results of investigational work by reviewing recent scientific literature in the various phases of natural resource sciences, horticulture and agronomy.

NRSC 410 Principles of Plant Pathology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Formerly: AGRO 102/HORT 102. Formerly: AGRO 386/HORT 389. Study of disease caused by living organisms and the mechanisms of disease which affect horticultural and agronomic crops. credit will be granted for only one of the following: CHEM 104 or CHEM 113, NRSC 201. Formerly HORT 489 (Fall '97 and Fall '98). Not open to students who have completed AGRO 202 or NRSC 202. Credit will be granted for only one of the following: NRSC 410 or HORT 489 (if taken in Fall '97 or Fall '98) or NRSC 410. An introduction to the casual agents, nature and management of plant diseases with particular attention paid to economically important diseases of horticultural and agronomic crops.

NRSC 411 Principles of Soil Fertility (3) Prerequisite: NRSC 440 or equivalent. Credit will be granted for only one of the following: AGRO 411 or NRSC 411. Formerly: AGRO 411. Soil factors affecting plant growth and quality with emphasis on the bioavailability of mineral nutrients. The management of soil systems to enhance plant growth by means of crop rotations, microbial activities, and use of organic and inorganic amendments.

NRSC 413 Soil and Water Conservation (3) Prerequisite: NRSC 203 or permission of department. Formerly: AGRO 102/HORT 102. Credit will be granted for only one of the following: AGRO 413 or NRSC 413. Formerly HORT 489. Importance and causes of soil erosion, methods of soil erosion control. Effects of conservation practices on soil physical properties and the plant root environment. Irrigation and drainage as related to water use and conservation.

NRSC 414 Soil Morphology Genesis and Classification (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: NRSC 200 (formerly LAND 200). Credit will be granted for only one of the following: AGRO 414 or NRSC 414. Formerly: AGRO 414. Processes and factors of soil genesis. The influence of climate, time, parent materials, organisms, topography, and time on soil. Soil morphological characteristics, composition, classification, survey and field trips to examine and describe soils.
PHIL 100 Introduction to Philosophy (3) An introduction to the literature, problems, and methods of philosophy. Prerequisite: One course in philosophy or permission of department. A study of some of the main figures in philosophical thought or through an examination of some of the central and recurring problems of philosophy.

PHIL 101 The Structure of Knowledge (3) Introduction to the literature, problems, and methods of philosophy through a study of problems concerning knowledge, belief, and evidence. The emphasis is on Western philosophy.

PHIL 102 Truth and Reality (3) Literature, problems, and methods of philosophy through study of questions about the nature of that which is true, the nature of reality, and the role of knowledge. Emphasis on Western philosophy and science.

PHIL 103 Self and Identity (3) An introduction to the literature, problems, and methods of philosophy through a study of problems about the self and personal identity. The primary emphasis is on Western philosophy, science, and social science.

PHIL 104 Action and Responsibility (3) Literature, problems, and methods of philosophy through a study of problems concerning actions, responsibility, and related topics in ethical theory. Emphasis on Western philosophy.

PHIL 105 God and Cosmos (3) Not open to students who have completed PHIL 236. Literature, problems, and methods of philosophy through a study of problems about God, self, and cosmos, and the relations among them. Emphasis on Western philosophy.

PHIL 110 Plato's Republic (3) Plato's Republic as a framework for examining and critiquing some of the central and recurring issues in political philosophy. The emphasis is on Plato's views into a single comprehensive philosophy, and the influence of this philosophy on western thought and culture. Readings from other Platonic dialogues and from secondary material.

PHIL 124 Contemporary Moral Issues (3) The uses of philosophical analyses in thinking clearly about such widely debated moral issues as abortion, euthanasia, homosexuality, corporal punishment, capital punishment, business ethics, sexual equality, and economic justice.

PHIL 134 Business Ethics (3) Introduction to ethical theories and theories of economic justice and their application to moral problems in business.

PHIL 170 Introduction to Logic (3) Development of analytical reasoning skills through study of formal logics, reasoning systems, and fallacious inference patterns.

PHIL 173 Logic and the English Language I (3) Basic techniques for analyzing deductive arguments. The uses of these techniques to illuminate the grammar and the logic of English sentence structure. The capacity of English to express logical distinctions. Exercises in analyzing the logical structure of published writings of varied style and content.

PHIL 174 Logic and the English Language II (3) Prerequisite: PHIL 173. An introduction to the logic of philosophical inquiry through study of inductive arguments against the capacity of the English language for exact expression. Exercises in critical analysis of published writings of varied style and content.

PHIL 201 Issues in the Philosophy of Life (3) Philosophical issues concerning life and what is admirable in human life. The emphasis is on Western philosophy and literature.

PHIL 206 Chinese Philosophy: Social and Political Thought (3) An introductory survey of Confucian philosophy and of other philosophies through history by examining such views into a single comprehensive philosophy, and the influence of this philosophy on western thought and culture. Readings from other Confucian dialogues and from secondary material. The Chou Dynasty (1122-222 BC) and the many schools of thought produced during that period. The reemergence of Confucian philosophy in the Sung Dynasty (960-1279 AD) and developments down to the contemporary period. Contemporary thought in the context of earlier Chinese traditions.

PHIL 209 Philosophical Issues (3) Repeatable to 6 credits if content differs. An examination of selected philosophical issues of general interest.

PHIL 223 Philosophy in Literature (3) Reading and philosophical criticism of fiction, poetry, and drama, dealing with issues of moral, religious, and metaphysical significance.

PHIL 234 Fundamental Concepts of Judaism (3) Also offered as [WST 234]. Not open to students who have completed [WST 254]. Credit will be granted for one of the following: PHIL 234 or [WST 254]. A broad survey of the fundamental concepts of Judaism, and some of the philosophical, ethical, and historical questions. Emphasis is on understanding the relationship between God and the world, and the role of philosophy in Judaism.

PHIL 236 Philosophy of Religion (3) A philosophical study of some of the main problems of religious thought: the nature of religious experience, the justification of religious belief, the conflicting claims of religion and science, and the relationship between religion and science.

PHIL 243 Philosophy of Rural Life (3) An examination of traditional and contemporary rural values and philosophies of life, with an emphasis on southern agrarian philosophies. Jefferson, Emerson, Thoreau, Populism, the Country Life Movement, the Garden City Movement, and contemporary views.

PHIL 245 Political and Social Philosophy I (3) A critical examination of such classical political theories as those of Plato, Hobbes, Locke, Rousseau, Mill, Marx, and such contemporary theories as those of Hayek, Rawls, and recent Marxist thinkers.

PHIL 250 Philosophy of Science I (3) Main issues in the philosophy of science. Special attention to the way scientific developments have influenced the philosophy of science and how philosophy of science has influenced scientific progress.

PHIL 256 Philosophy of Biology I (3) Issues in the discovery and justification of biological theories and models. Focus on cases from twentieth-century biology, such as the genetic revolution or evolutionary theory.

PHIL 271 Symbolic Logic I (3) Formerly PHIL 270. The formal analysis of deductive reasoning providing familiarities with techniques of formal deduction in propositional and first-order logic, as well as theorems about the completeness of basic concepts of formal semantics (truth tables, models).

PHIL 319 Logic for Philosophy (3) Major concepts underlying the modern formal logic development by Frege and Russell and their importance in contemporary philosophy.

PHIL 320 Introduction to Cognitive Science (3) The role of representation and reasoning in cognitions considered from the different perspectives of the cognitive sciences: linguistics, philosophy, neuroscience, psychology, and computer science.

PHIL 325 Studies in Contemporary Philosophy (3) Prerequisite: PHIL 200. Six credits in philosophy if credits differ. An examination of such philosophical issues as reason, the mind, and the physical sciences.

PHIL 331 Philosophy of Art (3) The role of art in society and the relation of art to the world. A study of the origins and development of the philosophical analysis of art, focusing on the pre-Socrates, Socrates, Plato, and Aristotle.

PHIL 326 Twentieth-Century Analytic Philosophy (3) Prerequisite: Six credits in philosophy. Recommended: PHIL 320. A study of major issues in twentieth-century analytic philosophy through an examination of such philosophers as Frege, Russell, Carnap, Moore, and Wittgenstein.

PHIL 332 Philosophy of the History of Philosophy (3) Prerequisite: Six hours of philosophy. Repeatable to 6 credits if content differs. Problems, issues, and points of view in the history of philosophy.

PHIL 338 Philosophy of Art (3) Prerequisite: One course in philosophy or art. An examination of such philosophical issues as reason, the mind, and the physical sciences.

PHIL 339 Philosophy of the History of Philosophy (3) Prerequisite: One course in philosophy or art. An examination of such philosophical issues as reason, the mind, and the physical sciences.

PHIL 339 Philosophy of Science (3) Main issues in the philosophy of science. Special attention to the way scientific developments have influenced the philosophy of science and how philosophy of science has influenced scientific progress.

PHIL 342 Moral Problems in Medicine (3) Prerequisite: PHIL 174 or permission of department. The study of the ethical issues that arise from the practice of medicine. Emphasis on the relationship between bioethics and political philosophy, and the social, legal, and ethical implications of medical practice.

PHIL 343 Philosophy of Biology I (3) Issues in the discovery and justification of biological theories and models. Focus on cases from twentieth-century biology, such as the genetic revolution or evolutionary theory.

PHIL 345 Environmental Ethics (3) Prerequisite: Six credits in philosophy. Recommended: PHIL 344. An introduction to the moral and ethical implications of environmental problems, including issues of resource allocation, pollution, conservation, and sustainability.

PHIL 346 Philosophy of Biology I (3) Issues in the discovery and justification of biological theories and models. Focus on cases from twentieth-century biology, such as the genetic revolution or evolutionary theory.

PHIL 361 Ethics in Business (3) Prerequisite: Six credits in philosophy. An examination of the ethical dimensions of business decision-making, focusing on issues of corporate responsibility, social justice, and sustainability.

PHIL 362 Philosophy of Science (3) Prerequisite: Six credits in philosophy. An examination of the ethical dimensions of business decision-making, focusing on issues of corporate responsibility, social justice, and sustainability.

PHIL 363 Philosophy of the History of Philosophy (3) Prerequisite: Six hours of philosophy. Repeatable to 6 credits if content differs. Problems, issues, and points of view in the history of philosophy.

PHIL 366 Philosophy of Religion (3) Prerequisite: Six credits in philosophy. An examination of the ethical dimensions of business decision-making, focusing on issues of corporate responsibility, social justice, and sustainability.

PHIL 372 Philosophy of Art (3) The role of art in society and the relation of art to the world. A study of the origins and development of the philosophical analysis of art, focusing on the pre-Socrates, Socrates, Plato, and Aristotle.

PHIL 376 Philosophy of Science (3) Main issues in the philosophy of science. Special attention to the way scientific developments have influenced the philosophy of science and how philosophy of science has influenced scientific progress.

PHIL 385 Philosophy of the History of Philosophy (3) Prerequisite: Six hours of philosophy. Repeatable to 6 credits if content differs. Problems, issues, and points of view in the history of philosophy.
PHYS 101 Contemporary Physics - Revolutions in Physics (3) Prerequisite: high school algebra through algebra 2 with trigonometry; or MATH 113 or MATH 115. Not open to students who have taken PHYS 107 or PHYS 111 or PHYS 112. For non-science students who are interested in the evolution of scientific thought and its present day significance. Historical, philosophical and theoretical aspects of physics are presented. Topics in mechanics, relativity, electricity and magnetism, and nuclear physics are covered.

PHYS 102 Physics of Music (3) Prerequisite: high school algebra. Credit not applicable towards the minimum requirements for a major in physics and astronomy. Optional laboratory to accompany PHYS 102. Laboratory experiments, including the velocity of sound, sound quality and wave shape, traveling and standing waves, fourier synthesis and analysis, musical synthesizer, and audio equipment.

PHYS 104 How Things Work: Science Foundations (3) Prerequisite: High School Math. This is a course with a non-mathematical emphasis designed to study the basics of mechanical and physical devices that are commonly found in the world around us. The general approach would be to look inside things to observe how they work.

PHYS 106 Light, Perception, Photography, and Visual Phenomena (3) Credit not applicable towards the minimum requirements for a major in physics and astronomy. Optional laboratory to accompany PHYS 106. Laboratory experiments include geometrical optics (lenses, cameras, microscopes), physical optics (telescopes, binoculars, photography, perception, color phenomena, and wave phenomena.

PHYS 111 Physics in the Modern World (3) The first semester of a survey course in general physics emphasizing the role that physics plays in science, technology, and society today. The course is concept oriented and minimal use of mathematics is made. Intended for the general student; does not satisfy the requirements for any other field.

PHYS 115 Inquiry into Physics (4) Five hours of laboratory per week. Recommended: High school physics. For Elementary Education, Early Childhood majors only. Not open to students who have taken PHYS 281. Credit will be granted for only one of the following: PHYS 115 or PHYS 117. Intended for students majoring in neither the physical nor the biological sciences. Use of laboratory-based inquiry-based methods to study basic principles of physics.

PHYS 117 Introduction to Physics (4) Three hours of lecture and two hours of laboratory per week. Prerequisite: qualification to enter MATH 110. Intended for students majoring in neither the physical nor biological sciences. A study of the development of some of the basic ideas of physics.

PHYS 121 Fundamentals of Physics I (4) Three hours of lecture, two hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: previous course work in trigonometry (high school or college level preferred). First semester covers the fields of mechanics, heat, sound, electricity, magnetism, optics, and modern physics. Together with PHYS 122, this generally satisfies the minimum requirement of medical and dental schools.

PHYS 122 Fundamentals of Physics II (4) Three hours of lecture, two hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: PHYS 121 or equivalent. Together with PHYS 121, this generally satisfies the minimum requirement of medical and dental schools.

PHYS 141 Principles of Physics (4) Three hours of lecture, two hours of laboratory, and one hour of discussion/recitation per week. Prerequisite: PHYS 121 or equivalent. Second semester covers the fields of mechanics, thermodynamics, and special relativity. This survey course will use calculus and is recommended for chemistry and zoology majors. It also satisfies the requirements of medical and dental schools.

PHYS 142 Principles of Physics (4) Prerequisite: PHYS 141 or equivalent. Second semester covers the fields of mechanics, thermodynamics, and special relativity. Together with PHYS 141 covering waves, electricity and magnetism, optics and modern physics.

PHYS 161 General Physics: Mechanics and Particle Dynamics (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisite: MATH 141. Credit will not be granted for PHYS 171 and PHYS 161 or PHYS 141 or PHYS 142, PHYS 262, PHYS 272, or former PHYS 192. A continuation of PHYS 141 covering waves, electricity and magnetism, optics and modern physics.

PHYS 170 Professional Physics Seminar (3) Corequisite: MATH 140. Recommended: high school physics. Provides a look at some of the major developments in current interest in physics research and discusses the activities physicists undertake in research, education, industry, government, and other areas of the economy.

PHYS 171 Introductory Physics: Mechanics and Relativity (3) Prerequisite: MATH 140 and a high school physics course or permission of department. Corequisite: MATH 141. Credit will not be granted for PHYS 171 and PHYS 161 or PHYS 141 or former PHYS 191. First semester of a three semester sequence for physics majors and those desiring a rigorous preparation in Newtonian mechanics, special relativity, quantum mechanics, Newtonian and Lagrangian mechanics, electricity, magnetism, wave phenomena, energy, force and energy, pressure, collisions, linear momentum, rotational and non-rotational motion.

PHYS 272 Introductory Physics: Fields (3) Corequisite: MATH 140 and PHYS 174. Recommended: high school physics. Provides a look at some of the major developments in current interest in physics research and discusses the activities physicists undertake in research, education, industry, government, and other areas of the economy.

PHYS 273 Laboratory Introduction (1) Three hours of laboratory per week. Prerequisites: PHYS 171 and one hour of discussion/recitation per week. Prerequisite: MATH 140 or MATH 221. The first part of a two-semester sequence in physics, stressing physics insight, for prospective secondary school science and mathematics teachers.

PHYS 274 Physics Laboratory Introduction (1) Three hours of laboratory per week. Prerequisite: PHYS 171 and one hour of discussion/recitation per week. Prerequisites: PHYS 174 or PHYS 171. Recommended: high school physics. Provides an introduction to the techniques of data gathering and analysis. This course will lay a foundation for higher-level labs in physics and the physical sciences.

PHYS 275 Oscillations and AC circuits using complex numbers (3) Credit will be granted for only one of the following: PHYS 275 or PHYS 263. Second course in the three semester introductory sequence. Methods and rationale of experimental physics. Experiments chosen from the fields of electricity and magnetism including electrostatics, magnetostatics, magnetic induction, AC circuits.

PHYS 276 Experimental Physics II: Electricity and Magnetism (2) Four hours of laboratory per week. Prerequisites: PHYS 272 and PHYS 275. Credit will be granted for only one of the following: PHYS 276 or former PHYS 272. Second course in the three semester introductory sequence. Methods and rationale of experimental physics. Experiments chosen from the fields of electricity and magnetism including electrostatics, magnetostatics, magnetic induction, AC circuits.

PHYS 289 Special Problems in Physics (1-6) Prerequisite: permission of department. May be taken no more than twice. Maximum of eight credits applicable to B.S. degree program. An special study to complement courses taken elsewhere which are not fully equivalent to those in departmental requirements. Credit according to work done.

PHYS 301 Intermediate Theoretical Physics (3) Prerequisite: PHYS 142 and MATH 241. Students interested should seek and obtain permission before being enrolled. Intended for the non-physicists or non-science major. Topics covered will include lasers, quantum liquids, cosmology, elementary particles and geophysics.

PHYS 305 Physics Shop Techniques (3) Three hours of laboratory per week. Prerequisite: PHYS 405 or permission of department. Machine tools, design and construction of laboratory equipment.

PHYS 318 Topics in Contemporary Physics (3) Prerequisite: PHYS 122 and/or PHYS 112 or permission of department. A survey of topics of current research and public interest. Intended for the non-physicists or non-science major. Topics covered will include lasers, quantum liquids, cosmology, elementary particles and geophysics.

PHYS 374 Intermediate Theoretical Methods (3) Three hours of lecture and one hour of discussion/recitation per week. Prerequisites: PHYS 273 and MATH 246. Co-requisite: MATH 240. Introduces or reviews areas of mathematics that are regularly used in upper level and graduate courses, including important areas from complex variables, Fourier analysis, partial differential equations and eigenvalue problems. These methods will be introduced and utilized in the context of relevant physics applications. A current standard symbolic manipulation program will be introduced and its appropriate use in theoretical analyses will be taught.

PHYS 375 Experimental Physics II: Electromagnetic Waves, Optics and Modern Physics (3) Three hours of laboratory per week. Prerequisites: PHYS 273 and PHYS 276. Credit will be granted for only one of the following: PHYS 375 or former PHYS 275. Second course in the three semester introductory sequence. Methods and rationale of experimental physics. Experiments chosen from the areas of electromagnetic waves, optics and modern physics.

PHYS 398 Undergraduate Thesis Research (1-6) Prerequisite: permission of department. Intended for the non-physicists or non-science major. Intended for the non-physicists or non-science major. Intended for students majoring in neither the physical nor biological sciences. Experiments chosen from the areas of electromagnetic waves, optics and modern physics.

PHYS 399 Independent Studies Seminar (1-16) Credit to be approved by advisor. Final written thesis and oral defense will be expected. May be taken no more than twice. Maximum of eight credits applicable to B.S. degree program. Enrolment is limited to students admitted to the independent studies program in physics.

PHYS 399 Special Problems in Physics (1-3) Two hours laboratory work per week for each credit. Prerequisite: PHYS 305 or permission of department. Six hours of laboratory per week. Prerequisites: PHYS 273 and PHYS 276. Credit will be granted for only one of the following: PHYS 399 or former PHYS 399. Second course in the three semester introductory sequence. Methods and rationale of experimental physics. Experiments chosen from the areas of electromagnetic waves, optics and modern physics.

PHYS 401 Quantum Physics I (4) Prerequisite: PHYS 273. Co-requisites: PHYS 374 and MATH 240. Credit will be granted for only one of the following: PHYS 401 or PHYS 420 and PHYS 421. Formerly PHYS 421. Introduces some quantum mechanics phenomena leading to wave-particle duality. Schrodinger equation, wavefunction, bound states and eigenvalues. One particle Schrodinger equation and the hydrogen atom.

PHYS 402 Quantum Physics II (4) Prerequisites: PHYS 401, PHYS 374, and MATH 240. Credit will be granted for only one of the following: PHYS 402 or former PHYS 422. Formerly PHYS 422. Four hours of laboratory per week. Prerequisites: PHYS 401 or PHYS 420 and PHYS 421. Study of atomic, multi-particle systems, the periodic table, perturbation theory, band structure, etc.

PHYS 404 Introduction to Statistical Thermodynamics (3) Prerequisites: PHYS 273 or equivalent, and MATH 241. Credit will be granted for only one of the following: PHYS 404 or
Approved Courses 223

Former PHYS 414. Formerly PHYS 414. Introduction to basic concepts in thermodynamics and statistical mechanics.

PHYS 405 Advanced Experiments (3) Prerequisite: PHYS 375. For PHYS majors only. Formerly PHYS 395. Advanced laboratory techniques. Selected experiments from many fields of modern physics. Emphasis on self-study of the phenomena, data analysis, and presentation in report form.

PHYS 406 Optics (3) Prerequisites: PHYS 263 or PHYS 273 or PHYS 301; and MATH 240. Geometrical optics, optical instruments, wave motion, interference and diffraction, and other phenomena in optical physics.


PHYS 420 Principles of Modern Physics (3) Prerequisites: PHYS 263 or PHYS 273 or PHYS 301; and MATH 241. A survey of atomic and nuclear phenomena and the main trends in modern physics. Appropriate for students in engineering and other physical sciences.

PHYS 426 Mathematica for Scientists and Engineers (3) Prerequisite: PHYS 263 or PHYS 273; and MATH 240. Geometrical optics, optical instruments, wave motion, interference and diffraction, and other phenomena in optical physics.

PHYS 428 Physics Capstone Research (2-4) Prerequisite: permission of instructor. Senior standing. For PHYS majors only. Repeatable to 4 credits. Individual, focused research under the guidance of a faculty member. Discussion, presentation and, if appropriate, research group projects involved. Student must submit final research paper for completion of the course. May also serve as thesis required for Honors in Physics. Not intended as a general "reading course" (see PHYS 499).

PHYS 429 Atomic and Nuclear Physics Laboratory (3) Prerequisite: PHYS 405. Classical experiments in atomic physics and more sophisticated experiments in current techniques in nuclear physics.

PHYS 431 Properties of Matter (3) Prerequisites: PHYS 411 and PHYS 401 or PHYS 420. Introduction to solid state physics. Emphasis on the elastic properties of metals, semiconductors, insulators and superconductors.

PHYS 441 Nuclear Physics (3) Prerequisites: PHYS 411 and PHYS 420 or PHYS 421. An introduction to nuclear physics at the pre-quantum-mechanics level. Properties of nuclei; radioactive decays; nuclear momenta; nuclear magnetic moment; model interaction of charged particles and gamma rays with matter; nuclear detectors; accelerators; nuclear reactions; beta decay; high energy phenomena.

PHYS 451 Introduction to Elementary Particles (3) Prerequisite: PHYS 402. Properties of elementary particles, production and detection of particles, relativistic kinematics, invariance principles and conservation laws.

PHYS 461 Introduction to Fluid Dynamics (3) Prerequisite: PHYS 263 or PHYS 273; and MATH 240. Kinematics of fluid flow, pressure, fluids at rest, friction, fluid elements, complex variable methods of analysis, wave motions.

PHYS 463 Introduction to Plasma Physics (3) Prerequisite: PHYS 411 or ENEE 380. Students without the electricity and magnetism prerequisite, but having a familiarity with Maxwell’s equations, should check with the instructor. Orbit theory, magnetohydrodynamics, plasma heating and stability, waves and transport processes.

PHYS 465 Modern Optics (3) Prerequisites: PHYS 410 and PHYS 420. Photons; optical phenomena; behavior of light in media; photon-electron-atom interaction; quantum optics.

PHYS 468 Biophysics and Theoretical Biology (3) Designed for advanced biology students who may have only minimal knowledge of biological processes but are well grounded in physics. Areas in bio-science where physics, physical chemistry, and mathematical analysis fuse to provide definitions for biologic statics and dynamics.

PHYS 485 Electronic Circuits (4) Two hours of lecture and four hours of discussion/recitation per week. Emphasis on understanding passive and active elements in practical circuits. Topics span the range from simple transistor circuits to microcomputers.

PHYS 487 Particle Accelerators, Physical and Engineering Principles (3) Prerequisites: PHYS 410 and PHYS 411; and PHYS 420. Properties of high-energy particles; methods of accelerating and focusing of electron and ion beams in electromagnetic fields; basic theory, design, and engineering principles of particle accelerators.

PHYS 499 Special Problems in Physics (1-16) For PHYS majors only. Research or special study. Credit according to work done.

PORT — Portuguese

PORT 101 Elementary Portuguese (4) One hour of laboratory and four hours of discussion/recitation per week. Introduction to basic structures, with emphasis upon audio-lingual skills. Leads to PORT 102.

PORT 102 Elementary Portuguese (4) One hour of laboratory and four hours of discussion/recitation per week. Prerequisite: PORT 101. Completion of basic structures with increasing emphasis upon reading skill, reinforced by conversation.

PORT 203 Intermediate Portuguese (4) One hour of laboratory and four hours of discussion/recitation per week. Prerequisite: PORT 102. Extensive reading, conversation and composition.

PORT 205 Intermediate Conversation (3) Prerequisite: PORT 203 or permission of department. Development of oral skills in Portuguese. Intensive conversation on contemporary issues.

PORT 223 Portuguese Culture (3) Political, social, intellectual, and literary forces shaping culture of contemporary Portugal from the formation of the nation to present days; differences between Continental, African and Spanish influences. Lectures, discussions, slides, video, and film presentations. In English.

PORT 225 The Cultures of Portuguese-Speaking Africa (3) Cultures of the Portuguese speaking countries of Angola, Cape Verde, Sao Tome e Principe, Guinea-Bissau and Mozambique. Special attention to the development of national cultures in multilingual societies and to the role of women. Conducted in English.

PORT 228 Selected Topics in Latin American Literature and Society (3-6) Repeatable to 6 credits if content differs. Also offered as SPAN 228. Credit will be granted for only one of the following: PORT 228 or SPAN 228. Variable cultural studies topics on literature and society in contemporary Latin America.

PORT 231 Introduction to the Literatures of the Portuguese Language (3) Prerequisite: PORT 205 or permission of department. Combines studies of Brazilian and Portuguese literatures, along with the examination of literary trends, concepts and terms to texts and excerpts of longer works, chosen for their cultural, historical and stylistic interest. Taught in Portuguese.

PORT 234 Issues in Latin American Studies I (3) Two hours of lecture and four hours of discussion/recitation per week. Major themes of department. Taught in English. Offered as SPAN 234 and LASC 234. Credit will be granted for only one of the following: PORT 234 or SPAN 234 or LASC 234. Major issues shaping Latin American and Caribbean societies including the changing constructions of race, ethnicity, gender, class and as expressions of popular cultures and revolutionary practices. A continuation of PORT/LASC SPAN 234, but completion of PORT 234 is not required.

PORT 235 Issues in Latin American Studies II (3) Two hours of lecture and four hours of discussion/recitation per week. Also offered as SPAN 235 and LASC 235. Credit will be granted for only one of the following: PORT 235 or SPAN 235 or LASC 235. Major issues shaping Latin American and Caribbean societies including the changing constructions of race, ethnicity, gender, class and as expressions of popular cultures and revolutionary practices. A continuation of PORT/LASC SPAN 234, but completion of PORT 234 is not required.

PORT 321 Survey of Portuguese Literature (3) Prerequisite: PORT 220 or PORT 221. An introduction to Portuguese poetry, fiction and drama from the twelfth century to the present.

PORT 322 Portuguese Film Literature (3) Prerequisite: PORT 221. Selected literary texts from the period of formation through nineteenth century romanticism to twentieth century.

PORT 323 African Literature of Portuguese Expression (3) Prerequisite: PORT 203. Recommended: PORT 205 and PORT 206. Representative literary texts (poetry, essay and fiction) from the African nations of Angola, Mozambique, Cape Verde, Guinea-Bissau and Sao Tome e Principe including discussions of the acculturated literary discourse, role of literature in the development of national consciousness and use of oral tradition.

PORT 350 History of the Portuguese Language (3) Prerequisite: (PORT 220 or PORT 221) or permission of department. Evolution of the Portuguese language from its formation to present days; differences between Continental, African and Brazilian usages.

PORT 378 Brazilian Cinema (in Translation) (3) Junior standing. The study of Brazilian film from the late 1950s to the present with a special view to the relationship between cinema and social changes. Taught in English.

PORT 399 Independent Study in Portuguese (1-3) Prerequisite: permission of department. Repeatable to 3 credits. Specific readings in PILP under the supervision of a faculty member of the department.

PORT 405 Portuguese for Spanish Speakers (3) Formerly PORT 121. Intensive basic grammar, reading and auditory comprehension. Native or acquired fluency in Spanish required.

PORT 408 Special Topics in Portuguese Literature (3) Prerequisite: PORT 221. Repeatable to 6 credits if content differs. Taught in English. A study of specific themes and movements either in Portuguese or Brazilian literature, as announced. Designed for students for whom the literatures would be inaccessible in Portuguese.

PORT 470 Modernism in Brazilian Prose Fiction (3) Prerequisite: permission of department. Prose of the Modernist movement in Brazil from 1922, including literary, sociological and historical dimensions.

PORT 476 Africa in Brazil (3) Junior standing. Not open to students who have completed PORT 470. Major themes and literary developments from the late eighteenth century to the present. Specific topic to be announced each time the course is offered.

PORT 477 Cross-Cultural Approaches to Contemporary Luso-Brazilian Societies (3) Prerequisites: PORT 205 or permission of department) and PORT 223 or PORT 224 or PORT 225. Analysis of cross-cultural interactions in international business in contemporary Luso-Brazilian societies.

PORT 478 Themes and Movements of Luso-Brazilian Literature in Translation (3) Repeatable to 6 credits if content differs. A study of specific themes and movements either in Portuguese or Brazilian literature, as announced. Designed for students for whom the literatures would be inaccessible in Portuguese.

PORT 480 Machado de Assis (3) Prerequisite: permission of department. Fiction of Machado de Assis covering his romantic and realistic periods.

PSYC — Psychology

The following courses may involve the use of animals. Students who are concerned about the use of animals in teaching have the responsibility to contact the instructor, prior to course enrollment, to determine whether animals are to be used in the course, whether class exercises involving animals are optional or required and what alternatives, if any, are available.

PSYC 100 Introduction to Psychology (3) A basic introductory course, intended to bring the student into contact with the major problems confronting psychology and the more important attempts at their solution.

PSYC 108 Honors Seminar (3) PSYC 200 Statistical Methods in Psychology (3) Prerequisite: PSYC 100; and MATH 111 or MATH 140 or MATH 220. A basic introduction to quantitative methods used in psychological research.
PSYC 206 Developmental Bio-psychology (3) Prerequisite: PSYC 100. A behavioral and neuro-anatomical description of development from conception through adolescence, including topics such as cognitive, emotional, and social development, and their neurobiological underpinnings.

PSYC 211 Developmental Psychology (3) Prerequisite: PSYC 100. A survey of human development, from birth through old age, with an emphasis on the biological, psychological, and social factors that influence development.

PSYC 357 Psychology of Adulthood and Aging (3) Prerequisite: PSYC 100. A study of the psychological, social, and biological changes that occur during adulthood and aging.

PSYC 361 Survey of Industrial and Organizational Psychology (3) Prerequisite: PSYC 100. A general survey of the field of industrial organizational psychology, including topics such as organizational behavior, motivation, leadership, and work attitudes.

PSYC 401 Biological Bases of Behavior Laboratory (4) Two hours of lecture and four hours of laboratory per week. Prerequisites: BIOL 105 and PSYC 200; PSYC 301 or equivalent; and permission of department. Restricted to majors who have completed 85 credits.. A laboratory course to introduce students to some of the basic physiological and psychological methods used in the study of behavior. The laboratory component of this course will be offered contingent upon enrollment. Experiments look at specific phenomena or groups of phenomena and how they control such simple behaviors as swimming, prey behavior, and the systematic exercise of living invertebrates and cold-blooded vertebrates.

PSYC 402 Physiological Psychology (3) Prerequisite: PSYC 206 or PSYC 301. Credit will be granted for only one of the following: PSYC 402; PSYC 403. Research on the physiological basis of behavior. Includes such topics as sensory phenomena, motor coordination, emotion, drives, and the neurological basis of learning.

PSYC 404 Introduction to Behavioral Pharmacology (3) Prerequisites: PSYC 200 and PSYC 235. Credit will be granted for only one of the following: PSYC 404; PSYC 410. Theoretical and experimental approaches to the study of drugs and behavior. Behavior is defined in terms of the interaction of drugs and behavior. Principles of pharmacological, the effects of drugs on various behaviors, experimental analysis of drug dependence and abuse, and neuropharmacology and behavior.

PSYC 410 Experimental Psychology: Sensory Processes (3) Prerequisites: PSYC 200, PSYC 301, and PSYC 410. Three hours of lecture and two hours of laboratory per week. Prerequisites: PSYC 200; and permission of department. Origins of psychology in philosophy and the study of mind in the nineteenth and twentieth centuries. Consideration of current theoretical perspectives and experiments in relation to the enduring problems of psychology, and of the role of psychological ideas, theories of psychological assessment including test development and trends. Theoretical viewpoints on the interaction of drugs and behavior. Behavior is defined in terms of the interaction of drugs and behavior. Principles of pharmacological, the effects of drugs on various behaviors, experimental analysis of drug dependence and abuse, and neuropharmacology and behavior.

PSYC 415 History of Psychology (3) Prerequisite: nine hours in psychology including PSYC 200. Three hours of lecture and two hours of laboratory per week. Prerequisite: PSYC 410. Required of psychology majors and all others upon the completion of the departmentally required English, math, and science supporting sequence. PSYC 415 is open to all students who have completed 85 credits. A laboratory course to provide a basic understanding of experimental method in social psychology and experience in conducting research on social processes.

PSYC 423 Advanced Social Psychology (3) Prerequisite: PSYC 420; or permission of department. A systematic review of research and experiments in regard to major problems in the field of social psychology.

PSYC 424 Communication and Persuasion (3) Prerequisites: PSYC 200; and PSYC 221. Effect of social communication upon behavior and attitudes. Theory and research concerning attitude change and social influence.

PSYC 423 Introduction to Counseling Psychology (3) Prerequisite: nine hours in psychology including PSYC 200. Analysis of research and intervention strategies developed and used by counseling psychologists. Historical and current trends in content and methodology.

PSYC 433 Basic Helping Skills: Research and Practice (4) Two hours of lecture and two hours of laboratory per week. Prerequisite: PSYC 200 and PSYC 225 or PSYC 324 or PSYC 412 or PSYC 430. This course addresses the basic helping skills that students will need as future professionals. The course includes both theoretical and practical components, focusing on the development of effective helping skills.

PSYC 435 Person Perception (3) Prerequisite: PSYC 100. A study of how individuals and groups form impressions of each other and will conduct research projects evaluating their helping skills. Students should be willing to talk about personal issues in class.

PSYC 434 Severe Mental Disorders: Etiology and Treatment (3) Prerequisites: PSYC 200, and PSYC 301, and PSYC 353, or permission of department. Examines multiple perspectives on severe mental illnesses such as schizophrenia and the major depressive disorders. Integrates content with the student's own thinking processes and problem-solving skills. Students will practice helping skills with patients suffering from these illnesses.

PSYC 435 Personality Theories (3) Prerequisite: PSYC 300; and PSYC 200 or equivalent. Major theories of personality and research methods and findings relevant to these theories.

PSYC 436 Introduction to Clinical Psychology (3) Prerequisite: PSYC 200 or equivalent. Critical analysis of current clinical problems with particular emphasis on current developments and trends.

PSYC 440 Experimental Psychology: Cognitive Processes (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: PSYC 100; and PSYC 200 or a statistics course from an approved departmental list; and completion of the departmentally required English, math, and science supporting course sequence. Restricted to psychology majors who have completed 85 credits.. A survey of the content, models, and methods in cognitive psychology with an emphasis on auditory and visual pattern recognition, information processing, memory, learning, and language.

PSYC 442 Psychology of Language (3) Prerequisite: PSYC 200; and PSYC 341 or PSYC 440, or permission of department. Introductory survey of topics in psycholinguistics, acquisition and development of language, the contribution of linguistic theory to the psychological study of language behavior and cognition. Linguistic theory, biological bases of language, and speech, grammatical and phonological performance, speech perception and production, psychological studies of syntax and semantics, language and cognitive development, language comprehension and thought.

PSYC 443 Thinking and Problem Solving (3) Prerequisites: PSYC 200 and PSYC 341 or PSYC 440, or permission of department. Historical development, current theory and data, and research methods in problem solving. Formal problem solving procedures including logical reasoning and human problem-solving behavior. The uses of strategies to improve students' own thinking processes and problem-solving behavior.

PSYC 450 Field Research in Organizational Psychology (4) Two hours of lecture and two hours of laboratory per week. Prerequisites: PSYC 100, PSYC 200 and completion of required English, math, and science sequence. Recommended: PSYC 341 or PSYC 342 or PSYC 440. Three hours of lecture and two hours of laboratory per week. Prerequisites: PSYC 200 and PSYC 341 or PSYC 440, or permission of department. Historical development, current theory and data, and research methods in problem solving. Formal problem solving procedures including logical reasoning and human problem-solving behavior. The uses of strategies to improve students' own thinking processes and problem-solving behavior.

PSYC 455 Life-Span Cognitive Development (3) Prerequisites: PSYC 200 and (PSYC 355 or PSYC 341 or PSYC 440). Three hours of lecture and three hours of laboratory per week. Prerequisites: PSYC 200; PSYC 301, and PSYC 353, or permission of department. A presentation of major research designs used in the study of psychological development. The course is used in developmental research, such as observational research, program evaluation, and laboratory experimentation.

PSYC 457 Cultural Context of Psychological Development (3) Prerequisite: PSYC 355, or PSYC 356, or PSYC 357, or permission of department. Origins of psychological thought about children, whether important differences or similarities exist among and within cultures in the way people develop psychological competencies in the period from birth through adolescence.
PSYC 458 Applied Developmental Psychology (3) Prerequisite: PSYC 200 and PSYC 355, or PSYC 356 or PSYC 357. Repeatable to 6 credits if content differs. An examination of a topic in developmental psychology which has been examined in one laboratory and is central to developmental theories. Extension of these analyses to practical and social issues in the daily life of the developing individual. Topics will vary from semester to semester.

PSYC 460 Psychological Foundations of Personnel Selection and Training (3) Prerequisites: PSYC 200 and PSYC 361. An examination of issues and processes involved in the design and evaluation of personnel selection and training programs in a variety of organizational settings: job, person and organizational analysis; organizational choice; development of predictors; evaluation of instructional and training systems; criteria for performance evaluation, evaluation and training.

PSYC 463 Psychology of Motivation and Attitudes in Organizations (3) Prerequisites: PSYC 200 and PSYC 361. Theories, research and practice regarding the assessment, understanding, and prediction of motivation at work. The relationship of motivation to various work-related attitudes. An integration of theory, research, and practice.

PSYC 464 Psychology of Leaders in Work Organizations (3) Prerequisite: PSYC 361 or equivalent. The psychological assumptions and implications of various theories of management and leadership. Selections and training; development of careers; influence processes; change of managers; and the impact of the selection process on the nature of product or service, and organization structure on managerial behavior.

PSYC 465 Psychology of Organizational Processes (3) Prerequisites: PSYC 200 and PSYC 361 or their equivalents. Theories of organizational, internal and intergroup relations, with emphasis on issues of conflict, competition, cooperation and the role of power in organizations. Organizational diagnosis and intervention.

PSYC 466 Environmental and Ecological Psychology (3) Prerequisite: PSYC 200. An examination of measurement, description, and impact of the physical and social environment that affects various aspects of behavior in school, at work, and during leisure.

PSYC 468 Field Experience and Special Assignments in Honors (1-3) Prerequisite: permission of department as well as supervisor and honors faculty. Repeatable to 6 credits. An individual experience arranged by the honors student and his or her supervisor. A proposal submitted to the honors faculty in the semester preceding registration for the course should state the activities anticipated and the method of evaluation.

PSYC 469 Honors Thesis Proposal Preparation (1-3) Prerequisite: Honors thesis supervisor's approval. Repeatable to 3 credits. Development of honors thesis proposal by preliminary research and literature review. Presentation of formal proposal to the thesis committee.

PSYC 478 Independent Study in Psychology (1-3) Prerequisite: Permission of department and faculty mentor. An individual study in the form of a written agreement signed by the student and the faculty mentor. The student must have completed 9 hours in psychology beyond PSYC 200 or PSYC 201. In psychology and PSYC 304 and (PSYC 305 or PSYC 307) with permission of the Chair of the Department of Psychology or the Psychology Undergraduate Committee. Integrated reading under direction leading to the preparation of an adequately documented report on a special topic.

PSYC 479 Special Research Problems in Psychology (1-3) Prerequisite: Permission of both department and instructor in the form of a written agreement signed by the student and the faculty mentor. The student must have completed 9 hours in psychology beyond PSYC 200 or PSYC 201. In psychology and PSYC 304 and (PSYC 305 or PSYC 307) with permission of both department and instructor leading to the preparation of a special topic.

PSYC 480 Senior Seminar (3) Prerequisite: PSYC 100. Treatment of a specialized topic in psychology.

PSYC 487 Advanced Psychology II (Honors) (3) Prerequisite: PSYC 486H or permission of department. Seminar covering topics in measurement, social processes, developmental processes and other subject matter of current interest.

PSYC 499 Honors Thesis Research (3) Prerequisite: PSYC 469 and permission of thesis advisor.

RUS — Russian

RUSS 101 Elementary Russian I (5) Two hours of lecture and six hours of laboratory per week. Not open to native speakers of Russian. Elements of grammar, pronunciation, conversation and reading exercises.

RUSS 102 Elementary Russian II (5) Two hours of lecture and six hours of laboratory per week. Prerequisite: RUSS 101. Not open to native speakers of Russian. Continuation of RUSS 101. Elements of grammar, pronunciation, and conversation; exercises in translation.

RUSS 201 Intermediate Russian I (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: RUSS 102. Not open to native speakers of Russian. Continuation of RUSS 102. For students planning to continue the study of Russian. Review and expansion of grammar knowledge, conversation and reading skills; exercises in translation. Note: this new course is not a replacement for the old SLAV 201, which is to be eliminated.

RUSS 202 Intermediate Russian II (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: RUSS 201. Not open to native speakers of Russian. Continuation of RUSS 201. Review and expansion of grammar knowledge, conversation and reading skills. Exercises in translation.

RUSS 210 Structural Description of Russian (3) Pre- or corequisite: RUSS 201 or equivalent. An introductory linguistic course designed to order and supplement students' knowledge of the sound system and the system of the verb. A practical component on reading skills also focuses on the verb and methods of developing vocabulary.

RUSS 211 Applied Russian Phonetics (3) Prerequisite: RUSS 202. Not open to native speakers of Russian. Pronunciation; the sounds and intonational patterns of Russian in contrast with those of English.

RUSS 221 Masterworks of Russian Literature I (3) Introduction to the classics of Russian literature in translation, beginning with Pushkin in the early 19th century and concluding with works of Dostoevsky and Tolstoy in the later part of that century.

RUSS 222 Masterworks of Russian Literature II (3) Introduction to the classics of Russian literature in translation, beginning with the end of the nineteenth century and concluding with contemporary works.

RUSS 281 Russian Language and Pre-Revolutionary Culture (3) Not open to native speakers of Russian. Introduction to the Russian language and a study of Russian nationalism; artistic and social concepts in the development of Russian art, dance, geography, history and literature from the 18th to the 20th centuries. Lectures in English, with third hour devoted to basic language instruction (alphabet, vocabulary, pronunciation and minimal conversational skills).

RUSS 282 Contemporary Russian Culture (3) Russia of the post-Communist era: archaeological, cultural, and philosophical implications of the disintegration of the former Soviet Union. Also included is a brief introduction to the Russian language: alphabet, sounds and intonational patterns. Taught in Russian.

RUSS 298 Special Topics in Russian Language and Literature: Russian Cinema (3) Repeatable to 6 credits if content differs.

RUSS 298BM Special Topics in Russian Language and Literature: Russian Cinema (3) Translation: The Eighties and the Nineties

RUSS 301 Advanced Russian I (3) Prerequisite: RUSS 202 or equivalent. Advanced training in written Russian communicative structures.

RUSS 302 Advanced Russian II (3) Prerequisite: RUSS 301. Advanced training in written Russian communicative structures.

RUSS 303 Russian Conversation: Functional Skills (3) Prerequisite: RUSS 202 or equivalent. Intended for students who do not anticipate having the opportunity to study in the Soviet Union. Skills for daily life (both function and etiquette) and the theater to the beginning of the 19th century pointing out the interrelationships of all with literary movements. Taught in Russian.

RUSS 335 20th Century Russian Literature in Translation (3) Prerequisite: RUSS 202 or equivalent. Development of honors thesis proposal by the activities anticipated and the method of evaluation.

RUSS 339 Selected Topics in Russian Language and Literature (3) Repeatable to 6 credits if content differs.

RUSS 401 Advanced Russian Composition (3) Prerequisite: RUSS 302.

RUSS 402 Practicum in Written Russian (3) Prerequisite: RUSS 401 or equivalent. Designed to improve comprehension of functional varieties of written Russian and develop ability to present in written form concise syntheses of source texts.

RUSS 403 Russian Conversation: Advanced Skills (3) Prerequisite: RUSS 302 or equivalent. Advanced spoken production of high-level, abstract language.

RUSS 404 Practicum in Spoken Russian (3) Prerequisite: RUSS 403 or equivalent. Taught in Russian. Introduction to the classics of Russian literature in translation, beginning with Pushkin in the early 19th century and concluding with works of Dostoevsky and Tolstoy in the later part of that century.

RUSS 405 Russian-English Translation I (3) Pre- or corequisite: RUSS 302 or equivalent. Introduction to the principles of translation of a particular genre, typically diplomatic, business, or literary.

RUSS 406 Russian-English Translation II (3) Prerequisite: RUSS 405. Continuation of RUSS 405.

RUSS 407 Commercial Russian II (3) Prerequisite: RUSS 307. Continuation of RUSS 307 focusing in the more difficult functional areas of Russian business documents and Russian business negotiations.

RUSS 409 Selected Topics in Russian Language Study (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Presentation of a topic in Russian language study.

RUSS 410 Applied Russian Linguistics (3) The nature of acquired linguistic and its contributions to the effective teaching of foreign languages. Comparative study of English and Russian, with emphasis upon points of divergence. Analysis, evaluation and construction of related drills.

RUSS 411 Linguistic Analysis of Russian I (3) Prerequisites: RUSS 210, and LING 200. Pre- or co-requisite: RUSS 301. Elucidation of theoretical concepts of modern linguistics through the analysis of problematic concepts in the Russian linguistic system. Phonology and the syntax of the simple sentence.

RUSS 412 Linguistic Analysis of Russian II (3) Prerequisite: RUSS 411. Continuation of RUSS 411. The syntax of the complete sentence, semantics.

RUSS 431 Russian Literature of the 19th Century I (3)

RUSS 432 Russian Literature of the 19th Century II (3)

RUSS 433 Russian Literature of the 20th Century (3)

RUSS 434 Soviet Russian Literature (3)

RUSS 439 Selected Topics in Russian Literature (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Presentation of a topic in Russian literature.

RUSS 473 Recent History of the Russian Language (3) Prerequisite: RUSS 210 or equivalent. Linguistic interpretation of Russian texts from the late 18th century to the present.
226 Approved Courses

RUSS 499 Independent Study in Russian (1-3) Prerequisite: permission to take 6 credits if content differs. Independent study under faculty supervision.

SLAV — Slavic

SLAV 469 Selected Topics in Slavic Studies (3) Prerequisite: permission to take 6 credits if content differs. Presentation of a topic in Slavic studies.

SLAV 475 Old Church Slavonic (3) Introduction to the language of the oldest recorded Slavic documents. Historical presentation of phonology, morphology, and syntax; reading of texts.

SLAV 479 Selected Topics in Slavic Linguistics (3) Prerequisite: permission of department. Repeatable to 6 credits if content differs. Presentation of a topic in Slavic linguistics.

SLAV 490 Directed Study (1-13) Prerequisite: permission of department. For advanced students. Repeatable to 6 credits if content differs.

SOCY — Sociology

SOCY 100 Introduction to Sociology (3) The fundamental concepts and principles of sociology. Includes consideration of culture, patterns of social interaction, norms, values, social institutions, stratification, and social change.

SOCY 105 Introduction to Contemporary Social Problems (3) An examination of contemporary social problems through sociological perspectives; ways in which social problems are part of the organization of society; a detailed study of selected social problems, including social conflict and social inequality.

SOCY 109 Freshman Seminar (3) This freshman seminar focuses on the long-standing debate over world population growth. Students will study the demographic sources of rapid population growth as well as the consequences of growth for the environment, food and water resources, health and nutrition, economic development and other related topics.

SOCY 201 Introductory Statistics for Sociology (4) Three hours of lecture and two hours of laboratory per week. Prerequisite: MATH 100 and MATH 111 or equivalent. Not open to students who have completed BMGT 231, ENEE 324, or STAT 400. Credit will be granted for only one of the following: AREC 420, BMGT 310, CNEC 400, ECON 311, ECON 312, ECON 313, EDMS 451, GEOG 305, GVT 422, PSYC 200, SOCY 201, URSP 350, or TEXT 400. Elementary descriptive and inferential statistics; construction and percenting of bivariate contingency tables; frequency distributions and graphical presentations; measures of central tendency and dispersion; parametric and nonparametric measures of association and correlation; regression; probability; hypothesis testing; the normal, binomial and chi-square distributions; point and interval estimates.

SOCY 202 Introduction to Research Methods in Sociology (4) Prerequisite: SOCY 100. The underlying logic, major strategies and specific techniques of sociological research. Research design, measurement, data collection, sampling, field research, permitted and prohibited techniques of group influence on human behavior, construction, data analysis, interpretation and report writing.

SOCY 203 Sociological Theory (3) Prerequisite: SOCY 100. Development of the science of sociology; historical backgrounds; recent theories of society. Required of all sociology majors.

SOCY 227 Introduction to the Study of Deviance (3) Credits will be granted for only one of the following: SOCY 227 or SOCY 327. Formerly SOCY 327. An introduction to the sociological study of deviant behavior, covering such topics as mental illness, social pathology, and the use of drugs.

SOCY 230 Sociological Social Psychology (3) Theoretical perspectives and their applications. Socialization through the life course, the self-concept, attitudes, emotion, attribution, interpersonal relations, group processes, deviance, and social change.

SOCY 241 Inequality in American Society (3) The dynamics of inequality: its social production, politics, future, and ideological bases. Utopian communities, efforts to eliminate inequality.

SOCY 243 Sociology of Marriage and Family (3) Credit will be granted for only one of the following: SOCY 243 or SOCY 343. Formerly SOCY 343. An examination of historical changes in family living, child rearing, divorce, social psychological theories of mate selection, marital interaction, and marital dissolution. Contemporary issues, such as the relationship of unmarried couples, alternative marriage forms, abortion, and violence in the family.

SOCY 305 Sacrality and Modern Society (3) Prerequisite: 3 credits of sociology. Resource depletion and the deterioration of the environment. Relationship to lifestyles, individual consumer choices, cultural values, and institutional failures. Projected society, an inquiry into the basis of the analysis of scarcity, theories of social change, current trends, social movements, government actions, and the future literature.

SOCY 325 The Sociology of Gender (3) Prerequisite: 3 credits of sociology or WMST 325. Credit will be granted for only one of the following: SOCY 325 or WMST 325. Institutional bases of gender roles and gender inequality, cultural practices on gender, gender socialization, sexism, feminism, and gender-role change. Emphasis on contemporary American society.

SOCY 333 Technology and Society (3) Prerequisite: 3 credits of sociology. Impact of technology on agriculture, the industrial revolution, automation and computerization, education and welfare, as these affect changes in social organizations. The development of small cities, the better utilization of energy, the use of wealth and power, and the development of new technology in the process of labor, and the role of technology in shaping of new forms of political and economic organizations.

SOCY 380 Honors Independent Reading in Sociology (3) Prerequisite: permission of department. Formerly SOCY 378. Formerly SOCY 396. Prone permits sociology honor students to undertake a program or reading on a particular problem in sociology or a sub-field therein. The reading will be done under the supervision of a member of the sociology faculty. Required of sociology honor students.

SOCY 381 Honors Independent Research in Sociology (3) Prerequisite: SOCY 380. Formerly SOCY 388. This course permits sociology students to define a particular problem in sociology and to develop a research plan for use as a thesis topic. The work will be done under the supervision of a member of the sociology faculty.

SOCY 383 Honors Thesis Research (3) Prerequisite: SOCY 381. Formerly SOCY 389. Student research under the direction of a member of the sociology faculty, culminating in the presentation and defense of a thesis reporting the research.

SOCY 390 Special Topics in Sociology (1-13) Prerequisite: 3 credits of sociology. Repeatable to 6 credits if content differs. Topics of special interest to both sociology majors and non-majors.

SOCY 399 Independent Study in Sociology (1-6) Prerequisite: 12 credits of sociology and permission of department. Repeatable to 6 credits if content differs. Integrated reading or research on a self-determined basis under the supervision of a faculty member. A maximum of 6 credits may be earned by a student for the same field experience in SOCY 386 and SOCY 396 combined.

SOCY 401 Intermediate Statistics for Sociologists (3) Prerequisite: 12 credits of sociology and permission of department. Not open to students who have completed ENEE 324, or STAT 400. Credit will be granted in the use of significance tests in sociology, one- and two-way analysis of variance, elements of multiple regression and correlation, techniques of descriptive and inferential statistics.

SOCY 402 Intermediate Procedures For Data Collection (3) Prerequisite: SOCY 202 or equivalent or permission of department. An intermediate survey of the major research methods used by sociologists, including survey research, experimentation, observation, archival research, and in-depth interviewing. The selection of an appropriate research method, with analysis of the strengths and weaknesses of various methods, practical issues, data collection and preparation, and analytical techniques.

SOCY 403 Intermediate Sociological Theory (3) Prerequisite: SOCY 201. Major sociological theories, their application and conceptualization. Analysis of the nature of the self-concept and the social forces that mold it. Major sociological, psychological, and psychoanalytic theories of the self-concept; self-concept motives; mechanisms of self-defense, and the nature of a healthy self-concept. Empirical research dealing with the bearing of social interaction, social structure, social context and social institutions on the self-concept.

SOCY 404 Sociology of the Self Concept (3) Prerequisite: 6 credits of sociology or permission of department. An examination of the nature of the self-concept and the social forces that mold it. Major sociological, psychological, and psychoanalytic theories of the self-concept; self-concept motives; mechanisms of self-defense, and the nature of a healthy self-concept. Empirical research dealing with the bearing of social interaction, social structure, social context and social institutions on the self-concept.

SOCY 411 Demographic Techniques (3) Prerequisite: SOCY 201 or equivalent and SOCY 410 or permission of department. Basic techniques for analyzing population structure and demographic processes, including fertility, mortality and migration.
SURV — Survey Methodology

SURV 400 Fundamentals of Survey Methodology (3)
Prerequisite: SURV 100 or permission of department. Credit will be granted for only one of the following: SURV 699M or SURV 400. The course will cover some of the main principles of survey design that are the basis of standard practices in the field. The course exposes the student to both observational and experimental methods to test key hypotheses about the nature of human behavior that affect the quality of survey data. It will also present important statistical concepts and techniques in simple design, estimation, and inference, as well as models of behavior describing errors in responding to survey questions. Not acceptable to graduate students in this number.

SURV 410 Introduction to Probability Theory (3) Prerequisite: MATH 240; and MATH 241 or permission of department. Credit will be granted for only one of the following: SURV 410 or STAT 410. Probability and its properties. Random variables and their distributions. Elements of non-parametric methods. (Not acceptable toward graduate degrees in STAT, MAPL, or MATH.)

THET — Theatre

THET 110 Introduction to the Theatre (3) Introduction to the people of the theatre: actors, directors, designers and backstage personnel. The core and characteristics of a play script; theatrical forms and styles; and theatre history.

THET 111 Making Theatre: Art and Scholarship (3) Prerequisites: THET 110 and THET 120. Systematic introduction to the tools and techniques used by theatre practitioners.

THET 120 Acting I (3) Two hours of lecture and two hours of laboratory per week. Prerequisite: THET 110 or permission of department. Basic principles of acting techniques. Exercises structured to develop the student’s concentration, imagination, sense and emotional memory. Textual analysis, character analysis and scene study; and the application of these techniques to character portrayal through performance of short scenes.

THET 170 Theatre Craft I (3) Two hours of lecture and one hour of laboratory per week. A survey of the fundamentals of stagecraft and scenic construction. The development of costume and set pieces; and the development of the costume construction process.

THET 284 Stage Costume Construction I (3) Prerequisite: permit of department. Credit will be granted for only one of the following: THET 284 or THET 484. Study and practical experience in garment construction and related costume crafts as used in theatre costume design. Flat pattern development and construction, costume design theory and organization of the costume construction process.

THET 290 American Theatre 1750 to 1890 (3) Formerly THET 371. Tracing the evolution of the American theatre from the beginning through 1890, aligning this theatre with the major social and movements of American society itself, and arriving at the uniquely American theatre and culture.

THET 291 American Theatre 1890-Present (3) Formerly THET 370. Tracing the evolution of the American theatre during the twentieth century, aligning this theatre with the major shifts and movements of American society itself, and arriving at the uniquely American theatre and culture of today.

THET 293 Black Theatre and Performance II (3) Sophomore standing. Thematic and historical survey of African-American drama from the late nineteenth century to the 1960’s. Emphasis on sociopolitical context, thematic thrust, issues, and styles, the aesthetic reflected in the work, impact on African-American and general theatre audiences.

THET 294 Black Theatre and Performance II (3) Sophomore standing. Thematic and historical survey of African-American drama from the 1960’s to the present. Emphasis on sociopolitical context, thematic thrust, issues and styles, the aesthetic reflected in the work, impact on African-American and general theatre audiences.

THET 310 Acting II (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: THET 110 and THET 120. Co-requisites: THET 111 and 221. Continuation of THET 120. Emphasis on the fundamentals of acting: personalization, objectives, and characterization.

THET 330 Play Directing I (3) Prerequisites: THET 111 and THET 120 and THET 170 and permission of department. A lecture-laboratory course dealing with the techniques of coordinating and designing the elements involved in a script through to performance. Study and practice in stage movement, composition, movement, pacing, script and character analysis, rehearsal routines, and selecting methods of communicating a script to an audience.

THET 341 Screenwriting I (3) One hour of lecture and two hours of discussion/recitation per week. Prerequisite: junior English. Not open to students who have completed THET 417 or THET 417. Introduction to screenwriting, emphasizing visual literacy necessary for effective television and film writing.

THET 350 American Musical Comedy (3) The evolution of musical comedy through opera to early American minstrelsy and minstrels to the musicals of the 1920’s and 1930’s. The development and shifts and movements of American society itself, and arriving at the uniquely American theatre and culture of today.

THET 371 Scenic Design I (3) Prerequisites: THET 110, THET 111, THET 170 and THET 273 or permission of department. Credit will be granted for only one of the following: THET 371 or THET 375. Formerly THET 375. A study of design theory and style. Methods and techniques of coordination on all elements of scenic design for theatre.

THET 372 Stage Property Design (3) Prerequisite: THET 170 or permission of department. A course in the design and execution of stage properties with special emphasis on period research, special materials, and special effects.

THET 373 Rendering for the Theatre (3) Prerequisite: permission of department. Credit will be granted for one of the following: THET 373 or THET 484. Formerly THET 484. Study in the techniques and tools of drawing and painting. The course is designed for the student to develop rendering and design skills for theatrical and other design work.

THET 375 Scenic Design II (3) Prerequisite: THET 273 or permission of department. A study of design theory and style. Methods and techniques of coordination on all elements of scenic design for theatre.

THET 377 Lighting Design I (3) Prerequisite: THET 110. THET 120 and THET 271 or permission of department. Credit will be granted for one of the following: THET 377 or THET 476. Formerly THET 476. A study of the theories of electification, instruments, design, color, and control for the stage; practical work on productions.
THET 383 Costume Design I (3) Prerequisites: THET 110, THET 111, THET 460 or permission of department. Credit will be granted for only one of the following: THET 383 or THET 480. Formerly THET 480. Basic principles of theatre costume construction through the media of line, color, and fabric. Emphasis on design, construction, and application of costume as an integral aspect of the production. The course will result in a portfolio of costume designs for presentation. The course is designed for the student to develop costume design and interpretation leading to understanding and facility in design of stylized productions. Emphasis on design for stage, dance, opera and other non-traditional forms of theatre production. THET 472 Stage Scene Painting (3) Prerequisites: THET 170 or permission of department. Students will be responsible for the following: THET 472 or THET 473. Formerly THET 472. Scene painting techniques and materials. Three-dimensional realistic scenery and nonrealistic two-dimensional projects. THET 473 Scene Painting (3) Prerequisite: THET 170 or permission of department. Students will be responsible for the following: THET 473. Scene painting techniques and materials. Three-dimensional realistic scenery and nonrealistic two-dimensional projects. THET 474 Stage Management I (3) Prerequisite: permission of department. Development of production techniques for stage management and technical theatre. Emphasis on areas of character. THET 499 Independent Study (1-3) Prerequisite: permission of professor. Open to all majors; all class appointments with professors, asking for information and advice. Also open to graduate students with their advisor's approval. THET 800 Honors Thesis I (1-3) Prerequisite: permission of professor. Open only to graduate students who have completed 24 hours of THET 800. Students must work on an honors thesis under faculty supervision in the department. THET 100 Introduction to Theatre (3) Prerequisites: THET 110 and THET 111; or permission of department. Recommended: THET 170, THET 171, Survey of costume, lighting, scenery, and sound design fundamentals. THET 101 History of Theatre (3) Prerequisites: THET 110; or permission of department. Recommended: THET 170, THET 171, Survey of costume, lighting, scenery, and sound design fundamentals. THET 102 Contemporary Theatre (3) Prerequisites: THET 110; or permission of department. Recommended: THET 170, THET 171, Survey of costume, lighting, scenery, and sound design fundamentals. THET 103 World Theatre (3) Prerequisites: THET 110; or permission of department. Recommended: THET 170, THET 171, Survey of costume, lighting, scenery, and sound design fundamentals. THET 104 Musical Theatre (3) Prerequisites: THET 110; or permission of department. Recommended: THET 170, THET 171, Survey of costume, lighting, scenery, and sound design fundamentals. THET 201 First Year Workshop I (1-3) Prerequisites: THET 110; or permission of department. Credit will be granted for only one of the following: THET 201 or THET 202. Formerly THET 201. Intensive practical study of the techniques and process involved in the creation of a theatrical production. THET 202 First Year Workshop II (1-3) Prerequisites: THET 110; or permission of department. Credit will be granted for only one of the following: THET 202 or THET 201. Formerly THET 202. Intensive practical study of the techniques and process involved in the creation of a theatrical production. THET 203 Advanced Musical Theatre Workshop I (1-3) Prerequisites: THET 110; or permission of department. Credit will be granted for only one of the following: THET 203 or THET 403. Formerly THET 203. Development of selected projects in musical theatre. THET 221 Theatre History I (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 222 Theatre History II (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 223 Theatre History III (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 224 Theatre History IV (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 225 History of Theatre I (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 226 History of Theatre II (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 227 History of Theatre III (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 228 History of Theatre IV (3) Prerequisites: THET 110; or permission of department. Development of ability to move, act and express through the media of lyric and music. THET 229 Actors' Workshop (1-3) Prerequisites: THET 110; or permission of department. Credit will be granted for only one of the following: THET 229 or THET 429. Formerly THET 229. Intensive practical study of the techniques and process involved in the creation of a theatrical production. THET 230 Approved Courses
one of the following: WMST 436 or GVPT 436. An examination of judicial interpretation and application of constitutional and constitutional law as these affect the status of women in American society.

WMST 444 Feminist Critical Theory (3) Prerequisite: ENGL 250 or WMST 200 or WMST 250. Also offered as ENGL 444. Credit will be granted for only one of the following: WMST 444 or ENGL 444. Issues in contemporary feminist thought that have particular relevance to textual studies, such as theories of language, literature, culture, interpretation, and identity.

WMST 448 Literature by Women of Color (3) Prerequisite: two English courses in literature or permission of department. Repeatable to 9 credits if content differs. Also offered as ENGL 448. Credit will be granted for only one of the following: WMST 448 or ENGL 448. Literature by women of color in the United States, Britain, and in colonial and post-colonial countries.

WMST 452 Women in the Media (3) Also offered as JOUR 452. Credit will be granted for only one of the following: WMST 452 or JOUR 452. Participation and portrayal of women in the mass media from colonial to contemporary times.

WMST 453 Victorian Women in England, France, and the United States (3) Also offered as HIST 493. Credit will be granted for only one of the following: WMST 453 or HIST 493. Examines the lives of middle and upper-class women in England, France, and the United States during the Victorian era. Topics include gender roles, work, domesticity, marriage, sexuality, double standards and women's rights.

WMST 454 Women in Africa (3) Also offered as HIST 494. Credit will be granted for only one of the following: HIST 494 or WMST 454. The place of women in African societies: the role and function of families; institutions such as marriage, birthing, and child rearing; ritual markers in women's lives; women in the workplace; women's associates; women's health issues; measures designed to control women's behavior; women and development.

WMST 455 Women in Medieval Culture and Society (3) Also offered as HIST 495. Credit will be granted for only one of the following: HIST 495 or WMST 455. Medieval women's identity and cultural roles: the condition, rank and rights of medieval women; their access to power; a study of women's writings and the constraints of social constructs upon the female authorial voice; and contemporary assumptions about women.

WMST 457 Redefining Gender in the U.S., 1880-1935 (3) Also offered as HIST 433. Credit will be granted for only one of the following: HIST 433 or WMST 457. Exploring changing perceptions of gender in the U.S., 1880-1935, and the impact of those changes on the day to day lives of men and women.

WMST 458 Literature by Women After 1800 (3) Prerequisite: two English courses in literature or permission of department. Repeatable to 9 credits if content differs. Also offered as ENGL 458. Credit will be granted for only one of the following: WMST 458 or ENGL 458. Selected writings by women after 1800.

WMST 466 Feminist Perspectives on Women in Art (3) Also offered as ARTH 466. Credit will be granted for only one of the following: WMST 466 or ARTH 466. Principal focus on European and American women artists of the 19th and 20th centuries, in the context of the new scholarship on women.

WMST 468 Feminist Cultural Studies (3) Repeatable to 9 credits if content differs. Each version of this course focuses on one or several forms of popular culture — such as tv, music, film, cyberculture, or genre fiction (for example, science fiction) — and demonstrates how feminists value, critique and explain such forms. Tools of feminist cultural studies include economic and social analyses of power, race, sexuality, gender, class, nationality, religion, technology, and globalization processes.

WMST 471 Women's Health (3) Also offered as HLTH 471. Credit will be granted for only one of the following: WMST 471 or HLTH 471. The women's health movement from the perspective of consumerism and feminism. The physician-patient relationship in the gynecological and other medical settings. The gynecological exam, gynecological problems, contraception, abortion, pregnancy, breast and cervical cancer, and surgical procedures. Psychological aspects of gynecological concerns.

WMST 488 Senior Seminar (3) Prerequisite: permission of department. Repeatable to 9 credits if content differs. Seminar for advanced majors in women's studies or other students with appropriate preparation. Interdisciplinary topics will vary each semester.

WMST 492 History of the American Sportswoman: Institutions and Issues (3) Prerequisite: KNES 293. Also offered as KNES 492. Credit will be granted for only one of the following: WMST 492 or KNES 492. Women's involvement in and contributions to America's sporting culture, especially in the 19th and 20th centuries. Pursued in depth are the interactions among historical perceptions of women's bodies, women's roles, responsibilities, and potential and their sporting lives. Also the effects of role stereotyping and opportunities for and directions taken in developing sport organizations, and other issues affecting women's involvement in institutional sport. Examines gender as a system of relations in the sport nexus.

WMST 493 Jewish Women in International Perspective (3) Prerequisite: one course in Women's Studies, preferably WMST 200 or WMST 250. Also offered as JWST 493. Credit will be granted for only one of the following: WMST 493 or JWST 492 or JWST 493. Using memoirs, essays, poetry, short stories, films, music and the visual arts, course will interrogate what it means/has meant to define oneself as a Jewish woman across lines of difference. Focus is largely on the secular dimensions of Jewish women's lives but will also explore the implications of Jewish law and religious practices for Jewish women. Our perspective will be international, including Ashkenazi and Sephardi women.

WMST 494 Lesbian Communities and Differences (3) Prerequisite: one course in Women's Studies, preferably WMST 200 or WMST 250. The meanings of lesbian communities across many lines of difference. Using lesbian-feminists of the 1970s as a starting point, we will look both back and forward in history, tracing changes and exploring the meanings of these in their social and historical contexts.

WMST 495 African-American Women Filmmakers (3) Also offered as THET 496. Credit will be granted for only one of the following: WMST 495 or THET 496. Examines the cinematic artistry of African American women filmmakers and the ways in which these films address the dual and inseparable roles of race and gender.

WMST 496 Advanced Special Topics in Women's Studies (3) Prerequisite: permission of department. Repeatable to 9 credits if content differs.

WMST 499 Independent Study (1-3) Prerequisite: one course in women's studies courses and permission of department. Research and written specific readings on a topic selected by the student and supervised by a faculty member of the Women's Studies Department.