

405B: French literature of the second half of the 19th century with special emphasis on the works of Balzac, Stendhal, Flaubert and Zola. Instruction is in French. *Prerequisite: FR 320.*

FR 420. Advanced Genre Studies. 3 credits. *Offered fall and spring.*

420A: A study of French theatre from the Middle Ages to the 20th century. *Prerequisite: FR 320.*

420B: A study of French poetry from the Middle Ages to the 20th century. *Prerequisite: FR 320.*

420C: A study of French narrative fiction from the Middle Ages to the 20th century. Instruction is in French. *Prerequisite: FR 320.*

FR 425. Twentieth-Century French Literature. 3 credits. *Offered fall and spring.*

425A: A study of the works of major French writers of the first half of the 20th century. *Prerequisite: FR 320.*

425B: A study of contemporary French novels written since 1950 with the emphasis on current fiction. Instruction is in French. *Prerequisite: FR 320.*

FR/ENG 435. Studies in French Literature. 3 credits. *Offered fall and spring.*

A study of selected works of French literature. Instruction is in English. May be repeated for credit when course content changes.

FR 440. Stylistics and Translation. 3 credits. *Offered fall and spring.*

An intensive course in writing and translation from and into English and French. Contemporary topics taken from various fields. Comparative terminology. *Prerequisite: FR 320.*

FR 446. Special Topics in Linguistics, Literature or Civilization.

3 credits. *Offered fall and spring.*

Study of a particular topic in French linguistics, literature or civilization. May be taught in English or in the language but cannot be counted for the major, minor or licensure unless taught in the language. *Prerequisite: FR 320.*

FR 465. French Cinema 1930-1980. 3 credits. *Offered fall and spring.*

A study of French cinematography from 1930 to 1980. Emphasis given on the following directors: Renoir, Pagnol, Carné-Prévert, Cocteau, Vadim, Chabrol, Resnais, Godard, Rohmer, Lelouch, Truffaut and Malle. Instruction is in French. Counts as a culture course, not as a literature course. *Prerequisite: FR 320.*

FR 466. Contemporary French Cinema. 3 credits. *Every other spring, starting spring 2007.*

A study of French cinema from the 1990s until the present and its place in contemporary French culture. The course will focus on films dealing with specific moments or events in French history, as well as the evolution of the French film industry. Films to be analyzed in terms of their socio-political context and judged by their cultural perspective. *Prerequisite: FR 320.*

General Education

The Human Community

GAFST 200. Introduction to Africana Studies. 3 credits.

An introductory survey of basic theoretical concepts to analyze the Black experience, with special focus on the general historical process common to Africa and the African Diaspora.

GAMST 200. Introduction to American Studies. 3 credits

This interdisciplinary course will highlight the student's role in interrogating the cultural and political function of representations of America in literature, history, philosophy, religion, popular culture, music and art. Students will gain an understanding of why definitions of American identity matter and learn about the contemporary debates that inform the discipline of American Studies today. Questions about the changing role of national studies in the face of globalization are central.

GANTH 195. Cultural Anthropology. 3 credits.

An introduction to the nature of culture and its relationship to language, economics, politics, kinship and other institutions in diverse cultures. The course also provides an overview of the theories, methods and ethical responsibilities involved in the study of cultural systems and ethnographic writing.

GANTH 196. Biological Anthropology. 3 credits (B,R).

An introduction to the origins, evolution and genetic variability of humans and their relationship to nonhuman primates. Examination of the fossil record, the relationship between biology and culture and human genetics are included. Theories and methods used in the study of biological anthropology are also introduced. Formerly *GSCI 116*. Students may not receive credit for both *GANTH 196* and *GSCI 116*.

GART 200. Art in General Culture. 3 credits.

An exploratory course which aims to develop a non-technical, general, cultural understanding of the space arts, such as architecture, painting, sculpture and industrial design. Emphasis is on the contemporary.

GARTH 205. Survey of World Art I: Prehistoric to Renaissance. 3 credits.

An introduction to the art and architecture of the world from cave painting through European pre-Renaissance art. Includes ancient through medieval art in Europe and the Near East as well as Asian and African arts.

GARTH 206. Survey of World Art II: Renaissance to Modern. 3 credits.

An introduction to the art and architecture of the world from the Renaissance through Modern ages. Includes European Renaissance, Baroque, Enlightenment, 19th and 20th centuries as well as Asian and African arts.

***ASTR 120. The Solar System.** 3 credits. *Offered once a year.*

An introductory course in astronomy, which includes the following topics: motions of celestial objects, eclipses, historical development, the nature of light, telescopes, properties and evolution of the solar system.

***ASTR 121. Stars, Galaxies and Cosmology.** 3 credits. *Offered once a year.*

An introductory course in astronomy which includes the following topics: the Sun, stellar properties, stellar evolution, black holes, the Milky Way, galactic evolution, quasars, cosmology.

GBIO 103. Contemporary Biology (3, 0). 3 credits.

An in-depth exploration of selected biological concepts, connected to current, relevant topics and emphasizing an understanding of science as a way of obtaining knowledge. Not available for major or minor credit in biology. Formerly *GSCI 103*. Students may not receive credit for both *GSCI 103* and *GBIO 103*.

GBUS 160. Business Decision Making in a Modern Society. 3 credits.

This course introduces the concepts of basic technology literacy, information retrieval via electronic and hard copy; along with critical thinking skills. Basic business principles will be introduced to reinforce these concepts and their relationships. The course provides opportunity for applying the skills of oral and written communication to a variety of learning activities. *Open to students who have not completed COB 300.*

GCOM 121. Fundamental Human Communication: Presentations.

3 credits.

Study of human communication as a process. Overview of the principles and practices of interpersonal, small group and public communication. Emphasis on examining the role of self-concept, perception, culture, verbal and nonverbal dimensions in the communication process, using power and managing conflict, applying critical listening, practicing audience analysis within informative speech making. Public speaking required.

GCOM 122. Fundamental Human Communication: Individual

Presentations. 3 credits.

Study of human communication as a process. Overview of the principles and practices of communication in a public environment. Emphasis on examining the role of self-concept, perception, culture, verbal and nonverbal dimensions in the communication process, using power and managing conflict, applying critical listening, practicing audience analysis, and constructing informative and persuasive speeches. Public speaking required.

GCOM 123. Fundamental Human Communication: Group Presentations.

3 credits.

Study of human communication as a process. Overview of the principles and practices of communication in small group and public communication contexts. Emphasis on examining the role of self-concept, perception, culture, verbal and nonverbal dimensions in the communication process, using power and managing conflict, applying critical listening, practicing audience analysis, and constructing informative and persuasive group presentations. Public speaking required.

GECON 200. Introduction to Macroeconomics. 3 credits.

Behavior of systems at the national and international levels. Topics include the methodology of economics as a social science, supply and demand, definition and measurement of important macroeconomic variables, and theoretical models of growth, inflation, interest rates, unemployment, business cycles, stabilization policy, exchange rates and the balance of payments. Not open to students who are enrolled in or who have received credit for *ECON 332*.

GEIC 101. Wellness Dimension: Individual Perspectives. 3 credits.
The study of individuals developing and functioning in the human community. Emphasis placed on genetics, social influences and interaction, health and wellness-related behaviors, and personal choices. Suggestions are given as to how these factors contribute to human development and influence dimensions of personal health and wellness throughout lifelong process.

GEIC 102. The Sociocultural Dimensions: Community Perspective. 3 credits.
The study of principles and practices of participation in communities. Emphasis placed on how leadership affects communication, conflict, diversity, community change and social responsibility. Primary focus on interpreting behavior, identifying and evaluating one's actions, understanding ethical and non-ethical practices, and identifying sociocultural and psychological variables within the social context.

GENG 235. Survey of English Literature: From Beowulf to the 18th Century. 3 credits.
A general survey presented chronologically.

GENG 236. Survey of English Literature: 18th Century to Modern. 3 credits.
A general survey presented chronologically.

GENG 239. Studies in World Literature. 3 credits.
Introduction to masterpieces of world literature with emphasis on non-Western literature. (May be focused regionally or topically.)

GENG 247. Survey of American Literature: From the Beginning to the Civil War. 3 credits.
A general survey presented chronologically.

GENG 248. Survey of American Literature: From the Civil War to the Modern Period. 3 credits.
A general survey presented chronologically.

GENG 260. Survey of African-American Literature. 3 credits.
Survey of literature by African-American authors from the 18th century to the present.

GGEOG 200. Geography: The Global Dimension. 3 credits.
This course promotes global understanding through the study of humans, their institutions and processes, and the resulting interactions between humans and the environment. The course will include the study of western and non-western peoples and their social, cultural, political and economic relationships.

GGEOL 102. Environment: Earth (3, 0). 3 credits.
A study of geological processes causing global change and their impact on human thought. The relationship between some geological processes and life on the Earth is also considered. Not available for major or minor credit in geology. Formerly GSCI 102. Students may not receive credit for both GGEOL 102 and GSCI 102.

GGEOL 115. Earth Systems and Climate Change. 3 credits.
This course explores cycles, trends and abrupt events in the Earth system. Analyses of the geologic record and global climate models provide perspective for understanding paleoclimate and future climate changes, including global warming. Current hypotheses for causes of climate change are evaluated, including plate tectonics, orbital cyclicity, variations in the sun's strength and human activities. The two re-occurring questions of this class are: What are Earth's climate stories? How do we know? Formerly GSCI 115.

GHIST 101. World History to 1500. 3 credits.
A survey of important historical developments from prehistoric times to 1500. Emphasis is given to the rise and decline of great world civilizations and their lasting contributions to humanity.

GHIST 102. World History Since 1500. 3 credits.
A survey of important historical developments from 1500 to the present. Emphasis is given to the growth of nationalism, the development of colonialism, and to world events, problems, and conflicts of the present century.

GHIST 150. Critical Issues in Recent Global History. 3 credits.
This course examines issues in recent history as a means to introduce, develop and enhance critical thinking skills and to supplement writing, oral communication, library and computing skills objectives for General Education Cluster One. A seminar format allows for careful examination of issues in both oral and written formats. The course emphasizes the development and articulation of well reasoned arguments in organized and grammatically acceptable prose.

GHIST 225. U.S. History. 4 credits.
A survey of U.S. history from the Colonial period to the present, emphasizing the development of American civic life, the involvement of the U.S. in world affairs and the cultural richness of the American people. This course stresses the analysis and interpretation of primary sources.

GHTH 100. Personal Wellness. 3 credits.
Emphasizes lifestyle behaviors contributing to health promotion and disease prevention. General areas affecting health status are identified and suggestions made as to how health-related behaviors, self-care and individual decisions contribute to wellness and influence dimensions of health. A one-hour weekly individual physical wellness lab is included.

GHUM 102. God, Meaning and Morality. 3 credits.
A study of the ways in which various communities perceive and understand the basis of knowledge, reality, meaning and purpose, ethics, and aesthetics. Students will explore religious and nonreligious approaches to these issues.

GHUM 200. Great Works. 3 credits.
An intensive examination of great literary works that focus on key issues of knowledge and reality, meaning and purpose, ethics, and aesthetics. Discussion, analysis and intensive writing are required. Texts will vary by section and instructor.

GHUM 250. Foundations of Western Culture. 3 credits.
This course is a study of the roots of our Western tradition in Greek, Roman, Medieval or Renaissance culture. Students examine the interrelationships among history and literary works; the fine arts; philosophical and religious thought and intellectual contexts. Content will vary depending on section and instructor.

GHUM 251. Modern Perspectives. 3 credits.
An interdisciplinary study within the modern period of arts and humanities. Students will examine the interrelationships among history and the arts, philosophy, religion and the intellectual ideas of the time. Topics will vary by section.

GHUM 252. Cross-Cultural Perspectives. 3 credits.
This course is a cross-disciplinary study of a non-Western culture. Students examine the ways people have responded to the human condition from different historical, religious and philosophical positions, and with their own artistic, musical and theatrical expressions. Sections, which vary by instructor, include East-Asian experiences and West-African humanities.

GISAT 112. Environmental Issues in Science and Technology (2, 3). 4 credits.
This course integrates the study of biology, chemistry and statistics within the context of environmental issues that include ozone depletion, acid rain, global warming, waste management and biodiversity.

GISAT 113. Issues in Science and Technology: Living Systems (2, 2). 3 credits.
This course introduces current topics in the life science technologies through lecture and laboratory exercises. Topics include advances in genetic engineering, the hierarchy of life and the rise of infectious diseases.

GISAT 141. Analytical Methods I (3, 2). 4 credits.
This course introduces the student to science and the scientific method; introductory statistics and graphical data analysis, with emphasis on using the computer for managing data and for empirical modeling; functions for modeling real-world systems; critical thinking skills for analyzing arguments involving data; and project management. *Corequisite: GISAT 112 or permission of instructor.*

GISAT 151. Analytical Methods I: Applied Calculus. 4 credits.
This course introduces the concepts of differential and integral calculus and ordinary differential equations to model real-world problems in the sciences, business, and economics. Includes a laboratory component emphasizing numerical applications on the computer. Course assumes familiarity with algebra and trigonometry.

GISAT 160. Problem Solving Approaches in Science and Technology. 3 credits.
This course examines issues in modern science and technology as a means to introduce, develop and enhance critical thinking and problem solving skills. Current scientific and technological research and applications will be introduced to reinforce problem solving, instruction in systems thinking and critical inquiry. The course provides opportunities for using both oral and written communication in a variety of learning activities.

GISAT 251. Analytical Methods III: Introduction to Statistical Reasoning and Data Analysis. 3 credits.

This course introduces statistical thinking—the discipline and methods for collecting, analyzing, and interpreting data for making decisions, doing science, and understanding our world. Topics covered include an introduction to: data analysis methods; probability and chance; statistical reasoning and inference; and experimental design. The course includes a laboratory component emphasizing hands-on analysis of data taken from a variety of applications in ISAT sectors and health related fields. *Prerequisite: Sophomore standing or permission of instructor.*

GKIN 100. Lifetime Fitness and Wellness (2, 2). 3 credits.

This course is designed to help students adopt and maintain the behaviors associated with an active and healthy lifestyle. Through this course students will learn the importance of maintaining wellness through a physically active lifestyle. Through lectures and labs, students study and develop the behavioral patterns consistent with the current knowledge base in fitness and wellness.

GMAD 150. Mediated Communication: Issues and Skills. 3 credits.

Study of how mediated communication shapes the content, meaning and impact of spoken, written and pictorial messages. Emphasis on the skills required to integrate speech, text and imagery into mediated presentations. Consideration of issues involving the critical evaluation of mass-mediated communication, their effectiveness and influence.

GMUS 200. Music in General Culture. 3 credits.

Designed to increase the student's perceptual ability in listening to music and to encourage an interest in both familiar and unfamiliar music. Primary study will be on music from the classic, Western heritage. Folk, jazz, popular and non-Western music may also be considered.

GMUS 203. Music in America. 3 credits.

Knowledge and skills to increase the student's perceptual ability in music listening with a survey of American music; examining relationships between popular and classical music styles.

GMUS 206. Introduction to Global Music. 3 credits.

A survey of various world music traditions, including those of Asia, the Pacific, Europe, Africa and the Americas. The course will focus on aesthetics, musical forms and styles, and the relationship between music and other arts. Emphasis will be placed on historical, religious, and cultural events and their influence on the creation and development of music.

GPHIL 101. Introduction to Philosophy. 3 credits.

An introduction to the basic problems and concepts of philosophy – the nature of man and the self, ethics, theories of knowledge, philosophy of religion, etc., as revealed in the writings of the major philosophers.

GPHIL 120. Critical Thinking. 3 credits.

An introduction to the techniques for analyzing and evaluating information in everyday experience. The functions of language will be discussed. Techniques for judging the strengths of arguments and the probable truth of the arguments' premises will be examined.

GPOSC 200. Global Politics. 3 credits.

An exploration of political, social and economic issues and structures existing within and between states in the contemporary global community. Students are introduced to alternative approaches to analyzing these issues in diverse cultures and political settings.

GPOSC 225. U.S. Government. 4 credits.

An examination of institutions, processes and intellectual concepts which structure American political activity. The interaction of the political system with the changing American society and America's changing role in world affairs are also treated. The course provides an introduction to quantitative methodology.

GPSYC 101. General Psychology. 3 credits.

A study of the nervous system, sensation, perception, consciousness, learning, memory, language, intelligence, motivation, emotion, life span development, personality, psychopathology, psychotherapy, social psychology and the scientific method.

GPSYC 122. The Science of Vision and Audition. 3 credits.

A study of human interaction with light and sound waves. Topics include physiological and perceptual mechanisms for processing light and sound, along with connections to real-world applications (e.g., human factors and careers within vision science and audition). Includes activities designed to provide students with in-depth, hands-on experience with course topics.

GPSYC 160. Life Span Human Development. 3 credits.

An introduction to human development. Emphasis is on life span processes within physical, emotional, cognitive, psychosexual, social, personality and moral development.

GREL 101. Religions of the World. 3 credits.

An investigation of the world's major religions which will give attention to their origin, history, mythology and doctrines.

GSCI 101. Physics, Chemistry and the Human Experience (3, 0). 3 credits.

A survey of the fundamental concepts, principles and ideas of chemistry and physics. Particular emphasis is placed on understanding the development of the principles and their application in understanding the world around us. *Prerequisite or corequisite: One of the following: MATH 103, MATH 107, MATH 205, MATH 220, MATH 231 or MATH 235.*

GSCI 104. Scientific Perspectives (0, 2). 1 credit.

A study of topics selected to allow students to participate in mathematical and scientific problem solving approaches to knowledge. *Prerequisite or corequisite as indicated on e-campus.*

GSCI 121. The Physical Nature of Light and Sound (3, 1). 4 credits.

A study of the physical properties of light and sound waves. Topics include production, propagation and spectral analysis of waves. Applications to be covered include musical instruments, sound reproduction, room acoustics, optical instruments (cameras, projectors, lasers), and color in art and nature. The course will include outside-of-class experiential activities.

GSCI 161. Science Processes. 1 credit.

Observing, classifying, measuring, inferring, communicating, predicting and experimenting in all science disciplines. This course will introduce core science process skills for all science disciplines in a hands-on, integrated laboratory block.

GSCI 162. The Science of the Planets. 2 credits.

The course will focus on the Earth and its neighbors, including the formation, evolution and dynamics of the Solar System. Students will also explore the similarities and differences of different solar system bodies (stars, planets, asteroids, comets) and the possibilities for finding life elsewhere. *Prerequisite: GSCI 161.*

GSCI 163. The Matter of Matter. 1 credit.

This course will focus on the topic of matter: particle theory, forms, characteristics, properties, atomic theory and models, conservation of mass and energy, nuclear reactions, heat transfer within matter, chemical bonds and chemical structures.

GSCI 164. Physical Science: Learning Through Teaching. 2 credits.

A hands-on conversation on how technology, science and engineering come together to describe our world. The course will cover many of the traditional concepts presented in an introductory physics course. The course will treat coordinate systems and their use in describing motion, forces and energy conservation, thermodynamics (temperature, pressure, heat), light (color, ray model, wave model), waves (sound), magnetism, and electricity. The course will indirectly reinforce skills developed in other courses in the cluster including scientific tools (mathematics, graphing, diagramming, experimenting and analyzing data) and using informational resources. *Corequisite: GSCI 163.*

GSCI 165. The Way Life Works. 1 credit.

Patterns, energy, information, life's machinery, feedback, community and evolution. These are major themes in how life works. This course will use these themes as a backdrop for looking at the way life works.

GSCI 166. The Environment in Context. 2 credits.

This course will use environmental issues and topics as a unifying concept to introduce ecology, environmental chemistry and evolution. Topics such as resource utilization and conservation, air and water quality issues, ecological succession, community processes, biological diversity and evolution may be used to illustrate the concepts and to demonstrate the relationship between science and public policy. *Corequisite: GSCI 165.*

GSOCI 210. Social Issues in a Global Context. 3 credits.

An examination of current global social issues, such as industrialization, economy, work, inequality, social movements and socio-political change. Addresses questions of definition, nature, history, patterns and consequences of various issues using sociological perspectives to examine and critique proposed social policies.

GSOCI 240. Individual in Society. 3 credits.

This course explores the importance of social structure, agency and symbolic interaction in the social construction of realities. It will examine major contributors to the sociological social psychological tradition. The course will help students reflect on issues such as self, self-presentation and identity, relationships, body, inequality, citizenship, nonconformity and resistance.

GTHEA 210. Introduction to Theatre. 3 credits.

Study of the theatre as an art form. Emphasis on introducing students to a broad spectrum of theatrical activity and opinion. Consideration of the components that comprise a theatre event including acting, directing, design, costuming, lighting and playwriting.

GWRT 103. Critical Reading and Writing. 3 credits.

The course emphasizes the process of constructing a focused, logical, coherent, well-supported thesis or point of view. The students will employ research and formal documentation to produce writing stylistically appropriate to its audience, purpose and occasion. The course also places emphasis on editing for clarity and control of conventions. Instruction in writing and research includes critical analysis of primary and secondary sources through a series of reading and writing assignments. Students are prepared to use reading and writing in their personal, academic and civic lives. *GWRT 103*, or its equivalent, fulfills the General Education Cluster One writing requirement and is a prerequisite for all *WRIT* courses numbered 200 or above.

General Business

College of Business

GBUS 160. Business Decision Making in Modern Society. 3 credits.

This course introduces the concepts of basic technology literacy, information retrieval via electronic and hard copy; along with critical thinking skills. Basic business principles will be introduced to reinforce these concepts and their relationships. The course provides opportunity for applying the skills of oral and written communication to a variety of learning activities. *Open to students who have not completed COB 300.*

Geographic Science

Department of Integrated Science and Technology

GEOG 161. Geospatial Tools and Techniques. 1-6 credits, variable.

An introduction to the use of geospatial tools, such as geographic information systems (GIS), global positioning systems (GPS) and remote sensing, applied to a variety of areas, including cultural geography, environmental science, ecology, geology and public planning.

GGEOG 200. Geography: The Global Dimension. 3 credits. *Offered fall and spring.*

This course promotes global understanding through the study of humans, their institutions and processes, and the resulting interactions between humans and the environment. The course will include the study of Western and non-Western peoples and their social, cultural, political and economic relationships.

GEOG 205. Cultural Geography. 3 credits. *Offered fall and spring.*

Introduction to cultural geography with emphasis on diversity of language, religion and folklore, as well as culture traits and practices and their historical diffusion. Ties to livelihood, the rural-urban continuum and demographic change are explored, as are foci on philosophy, power, race, class and gender. Exploitation and sustainability will be introduced as dimensions of cultural and environmental interaction.

GEOG 210. Physical Geography (2, 2). 4 credits. *Offered fall and spring.*

This introductory course is an examination of systems and processes that influence patterns of Earth's atmosphere, biotic communities, soils and landforms at multiple spatial and temporal scales. Included are classroom and laboratory experiences that are geared toward investigating interrelationships among atmospheric conditions, Earth's natural surface characteristics and human-induced modifications of Earth's features.

GEOG 215. Geospatial Tools I – Cartography and GIS. 3 credits. *Offered fall.*

An introduction to cartography and geographic information systems (GIS). Basic concepts will be illustrated with examples from a variety of application areas, including cultural geography, environmental science, land use, and planning and business.

GEOG 216. Geospatial Tools II – Remote Sensing and GPS. 3 credits.

Offered spring.

An introduction to remote sensing, global positioning systems (GPS) and computer fundamentals in geographic science. Basic concepts will be illustrated with practical applications, including hands-on work collecting data with GPS units and exploring sensing images from a variety of different instruments. Environmental applications will be featured.

GEOG 230. Spatial Thinking and Problem Solving. 3 credits. *Offered spring.*

Introduction to the critical thinking skills associated with problems inherent spatial components. Identification of the spatial elements of a given problem, the data requirements for addressing that problem, collections/acquisition, and organization of data and use of geographic information systems to explore spatial patterns relevant to the problem of interest. *Prerequisites: GEOG 215, GEOG 216 and an introductory course in statistics (GISAT 251 or equivalent) or permission of instructor.*

GEOG 260. Selected Topics in Geography. 3 credits. *Offered occasionally.*

Exploration of geographic topics, tools or techniques of current interest. Can be repeated as course content changes.

GEOG 280. Human Geography: The Cultural Landscape. 3 credits.

Offered fall and spring.

The course themes are human culture, cultural variations over the face of the Earth and how these variations are related to selected global issues. Topics covered include world demographics, world religions and languages, patterns of human migration, political systems and human conflict, agricultural systems, and impact on the physical world.

GEOG 290. Human Interactions with the Physical Environment.

3 credits. *Offered spring.*

This course evaluates human-environment interactions from a holistic point of view. It incorporates geographic perspectives of these interactions, which include political, cultural, social, economic and ethical factors that influence how people perceive, impact and manage the natural world. The course will emphasize geographic theories of resource use, humans as part of the landscape and human vulnerability to environmental changes. *Prerequisites: GEOG 205 and GEOG 210.*

GEOG 300. Population Geography. 3 credits. *Offered fall and spring.*

An introduction to population measurement, sources of population data and modern population problems. Topics include distribution, the changing age structure and migration issues affecting the U.S. At the global scale, topics include distribution, global migration patterns, the refugee crisis and prospects for feeding the rapidly increasing human population.

GEOG 305. History and Philosophy of Geography. 4 credits. *Offered fall and spring.*

Topics from the classical period to the modern period include 20th century theories and paradigm shifts involving cultural geography, physical geography, human-environment traditions, regional geographies and modeling. Diverse philosophies such as quantitative/positivist, qualitative/humanistic social theory and GIS are viewed for their contributions to the discipline of geography. *Prerequisite: Junior standing or permission of the instructor.*

GEOG/GEOL 310. Environmental Issues. 1-4 repeatable credits, no limit.

Courses cover environmental issues such as air pollution, forest and wildlife management, water, resource management, soils and land use, and energy and the environment (among other topics). Courses examine the interface between humans and environmental systems while addressing the impact of social, economic and political systems and activities on the environment. May be repeated as course content changes.

GEOG 311. Endangered Environments. 3 credits. *Offered spring.*

In this course an investigation is made of a selected number of environmental problem areas around the world. Some examples include the temperate rainforest of Valdivia, South America, the tropical rainforests of Borneo and the Aral Sea of Eastern Europe. In the course, students will explore physical aspects of each environment and explore human impact and potential solutions to the problems.

GEOG 315. Field Studies in Geography. 3 credits. *Offered spring.*

This course exposes students to the methods and techniques commonly used by geographers while conducting fieldwork. The course will cover identifying and defining a researchable project, designing and testing data collection methods, and different methods of collecting, recording and presenting data. Students will also become familiar with various types of field equipment.

GEOG 320. Human Dimensions of Global Change. 3 credits. *Offered once a year.*
This course addresses global change and human development. Conservation, sustainability and development are core themes that will be related to current changes occurring on a global scale. Global changes to be discussed in the course related to the climate, biodiversity, natural resources and human populations. Sustainability will be introduced as a dimension of human development. *Prerequisite: GEOG 290.*

GEOG 322. Agricultural Systems. 3 credits. *Offered spring.*
This course covers four distinct areas: the foundation of agriculture, the nature and distribution of soils on a global basis; the history of agriculture from the original selection of domestic crops to the 20th century; modern industrial agriculture and trade; and alternatives to chemical and energy intensive agriculture in the 21st century. *Prerequisites: GEOG 290 or permission of instructor.*

GEOG 325. Environmental Ethics. 3 credits. *Offered fall.*
Examines the basic principles of resource use including geographic, economic, social and political processes. Explores concepts underlying such issues as resource consumption and conservation, environmental perception, resource and environmental conflict, population growth and control, carrying capacity, and the evolution of the environmental movement.

GEOG 327. Climatology. 3 credits. *Offered spring.*
The systematic study of the atmosphere with emphasis on such phenomena as temperature, pressure, humidity, air masses and fronts; the occurrence of these phenomena on a global basis; and a detailed survey of the worldwide distribution of climate types. *Prerequisite: GEOG 210.*

GEOG 332. Geography of Europe. 3 credits.
Geographic assessment of regional and national characteristics of the European nations.

GEOG 333. Geography of Russia and the Former Soviet Union. 3 credits.
A study of the people and culture of Russia with an emphasis on their social, economic and political processes and situation. An analysis of how the interaction of geographic, social, political and economic factors affect the lives of the Russian people.

GEOG 334. Geography of East and Southeast Asia. 3 credits. *Offered spring.*
A survey of the physical and cultural environments of China, Taiwan, Japan, the Koreas, Indochina and the countries of Southeast Asia. Topics covered include weather and climate, physiography, natural resources, population characteristics, political systems, aspects of the economy, and the role that each country plays on the regional and world stage.

GEOG 335. Geography of Africa. 3 credits. *Offered spring.*
An introduction to the regional geography of Sub-Saharan Africa that examines the physical geography of the continent, the historical roots of its present political geography, the consequences of its colonial past on communities and cultures, as well as its natural resources. Students will examine continental issues such as resource management, food production, hunger, disease patterns and management of wildlife. *Prerequisite: GEOG 290 or permission of the instructor.*

GEOG 337. Geography of Latin America. 3 credits.
A study of countries in Latin America which includes their physical landforms, weather and climate, biogeography, natural resource base, attitudes toward the physical environment, characteristics of the economy, the current political role in international activities, and population characteristics that include growth rate, distribution, migration and ethnicity.

GEOG 338. Geography of the Philippine Islands: Problems and Possibilities. 3 credits. *Offered summer.*

Exploration of the Philippines focuses on poverty, environmental conservation, resource exploitation and ecosystem degradation in upland and marine environments. Topics include population dynamics, political pressure and instability, and urban challenges. The future of the country is investigated on all geographic scales with regard to its role in a globalized world.

GEOG 340. Biogeography. 3 credits. *Offered spring.*
This course emphasizes geographical biogeography and is an advanced physical geography class. Included are analyses of spatial patterns of biota from local to global scales and examinations of the systems and processes that result in spatial and temporal patterns of species existence and diversity, community composition, energy pathways, adaptive traits, and human influences on biotic systems and processes. *Prerequisite: GEOG 210.*

GEOG 341. Wilderness Techniques. 3 credits. *Offered spring.*
Wilderness legislation, legal mandates and wilderness issues are examined. Human impacts due to overuse or conflicting uses are studied, as are the philosophical aspects of wilderness ethics. This course is taught entirely in the field. Camping and hiking are required. *Prerequisite: Permission of instructor.*

GEOG 342. Management and Protection of Natural Resources. 3 credits. *Offered fall.*

This course provides a managerial perspective for protection and management of natural resources. A systems approach for applied management strategies is provided for aquatic, terrestrial, threatened and endangered ecosystems. Topics include application of state, federal, international laws, regulations, policies and guidelines. Students develop management plans and explore jurisdictional resource protection issues.

GEOG 343. Wildlife Management. 3 credits. *Offered fall and spring.*
An introductory discussion of applied management strategies for wildlife species and their ecological requirements is provided relative to human influences. Management techniques that are useful for determining population or health status are demonstrated for select vertebrate species. The evolution of wildlife laws, policies and management strategies are addressed to provide relevant awareness into the appropriate concepts of wildlife management.

GEOG 344. Economic Geography and Development Issues. 3 credits. *Offered fall.*

An overview of the classification of economic activities, the factors involved in the location of various types of economic activities and the regional variation in the standard of living associated with economic development. Additional topics include regional economic growth and types of economic systems and development perspectives, the roles that politics and demographics play in the economic development of a country, and the globalization of economic activities.

GEOG 345. Geography of Poverty. 3 credits. *Offered once a year.*
This course provides a geographical perspective on poverty faced by communities and countries of the world today. The focus is on how poverty is defined, measured and mapped, the causes and impacts of poverty, theories for ending poverty and organizations that work to address poverty. It includes a geographical study of communities and countries that have successfully alleviated extreme poverty.

GEOG 350. Topics in Geography. 1-3 credits. *Offered spring.*
Examination of geographic topics that are of current interest. Can be repeated as course content changes. *Prerequisite: Permission of instructor.*

GEOG 365. Cartography and Geospatial Visualization. 3 credits. *Offered fall and spring.*

This course examines the fundamentals of visualizing spatial data in static and dynamic environments. Students will learn about cartographic design, thematic cartographic techniques, developing spatial data from non-spatial information and with GPS equipment, and geographic visualizations. Students will also develop a portfolio of hard copy and soft copy visualizations. *Prerequisite: GEOG 215.*

GEOG 366. Introduction to Geographic Information Science. 3 credits. *Offered fall.*

An overview of geographic information science and its role in technology and society. Spatial databases and descriptive data will be created and implemented into various geographic information systems. Advanced analytical operations will be used to practice the analysis capabilities of geographic information systems. *Prerequisite: GEOG 215 or permission of the instructor.*

GEOG 375. Political Geography. 3 credits. *Offered fall and spring.*
Geopolitical conflicts and issues are examined. Concepts such as territoriality, nationalism, religious and ethnic struggle, environmental degradation, and freedom and justice are discussed in the context of political unrest. Significant geopolitical theories and social and economic processes are explored.

GEOG 376. Urban Geography. 3 credits. *Offered spring.*
Study of the city in its geographic setting, giving perspective of modern urban problems, origin and growth of cities and influence of location on city functions. Looks at the internal structure of cities and the influence of the internal structure on its population groups.

GEOG 385. Principles of Remote Sensing (2, 2). 3 credits. *Offered fall and spring.*
This course is an introduction to remote sensing, the study of images and other types of data acquired by satellites and aircraft. Topics include the principles underlying multiple types of remote sensing, the properties of common data types, making measurements using aerial photographs, basic digital image processing and applications. *Prerequisite: GEOG 216.*

GEOG 390. Senior Project Design. 1 credit.
The first in a sequence of three courses designed to involve students in research projects. This course focuses on identifying and designing a research project. *Prerequisite: Junior standing.*

GEOG/ISAT 429. Sustainability: An Ecological Perspective. 3 credits.
Offered spring.

This course examines present global environmental impacts and efforts made to change production and consumption patterns toward those that reduce impact on ecosystems or promote increased ecosystems health. The focus lies in understanding the basic resources of productivity including soils, agricultural systems, agroforestry, forestry and aquatic environments and applying solutions on a personal and community level. *Prerequisite: GEOG 320, senior standing or permission of instructor.*

GEOG 430. Geography of Crop Plants. 3 credits. *Offered periodically.*
This course evaluates the influence of geography on crops and crop development by examining the evolution, genetic diversity and cultivation of agricultural crops. Topics include the origins of agriculture, patterns of geographic spread, and the interrelationships between domesticated plants and the societies that grow them.

GEOG 465. Topics in GIS. 3 credits. *Offered periodically.*
The course examines varying topical issues in geographic information science. The course may be repeated as course topics vary. *Prerequisite: GEOG 366 or permission of the instructor.*

GEOG 466. GIS and Geographic Databases. 3 credits. *Offered fall.*
An introduction to the creation, use and management of digital spatial data used by industry and government. Integration of large spatial data sets into the geographic information system, data management and data exchange, and the geodetic transformation of data sets are emphasized. Digital elevation models, land use data, population data, digital topographic map and street network data will be used. *Prerequisite: GEOG 366 or permission of instructor.*

GEOG 467. GIS Project Management. 3 credits. *Offered fall.*
An introduction to geographic information systems (GIS) project management. Basic project management techniques will be applied by defining, designing, implementing and documenting a geographic information system. *Prerequisite: GEOG 366 or permission of instructor.*

GEOG 468. Internet Geographic Information Systems. 3 credits. *Offered spring.*
Theoretical and practical exploration of methods, standards and policies related to the development and utilization of geographic information systems on the Internet. Students will create and utilize distributed geospatial data and analytical systems using the World Wide Web and the Internet to address geographical problems. *Prerequisite: GEOG 366 or permission of instructor.*

GEOG 469. Applications of Geographic Information Systems. 3 credits.
Offered once a year.

This course advances the knowledge of GIS in theory and practice by focusing on specific application areas. Spatial databases and complex attribute data will be created, and GIS modeling techniques will be used to solve problems relevant to the specified topical area. The course may be repeated once for additional credit when the topic changes. *Prerequisite: GEOG 366 or permission of instructor.*

GEOG 470. Senior Seminar in Environmental Conservation, Sustainability and Development. 3 credits. *Offered fall and spring.*
This capstone seminar integrates the student's previous class experiences to provide a holistic exploration of linkages between environmental conservation and human development status and strategies through in-depth analysis of compelling human-environment issues. Topics vary by semester and include environmental politics, global perspectives on population, sustainable communities and global biodiversity. For majors and minors only. *Prerequisite: GEOG 320, senior standing or permission of instructor.*

GEOG 485. Processing Remotely Sensed Data. 3 credits. *Offered spring.*
This course focuses on computer-based techniques for processing remotely sensed data and applications of these techniques. Subjects covered will include geometric and radiometric correction, image enhancement, data transformations, change detection and quantification, and classification. Both traditional techniques and techniques designed for newly available data types will be examined. *Prerequisite: GEOG 385 or permission of instructor.*

GEOG 486. High Spatial Resolution Remotely Sensed Data. 3 credits. *Offered periodically.*
This course focuses on the acquisition and use of high spatial resolution remotely sensed data. Topics include aerial photograph acquisition, digital terrain model creation, orthorectification, object oriented image processing, image fusion, visual image interpretation, collecting and processing LIDAR data, and ethical and legal issues associated with high spatial resolution data. *Prerequisite: GEOG 385 or permission of the instructor.*

GEOG 490. Senior Project II. 3 credits. *Offered fall and spring.*
Student performs an independent research project, either alone or within an investigative team, to identify and analyze a problem from a geographic perspective. *Prerequisites: GEOG 390 and permission of instructor.*

GEOG 491. International Studies. 3 credits. *Offered fall and spring.*
This course fulfills the capstone experience requirement for students majoring in geography. Students will make arrangements for the international experience. A research project or work-study project will be designed by the student and faculty member prior to departure. The research or work will be carried out in the country of travel. *Prerequisites: GEOG 390 and permission of instructor.*

GEOG 495. Internship in Geography. 3-6 credits. *Offered fall and spring.*
Practical experience in and observation of a public agency utilizing geographic methodology. Work experience will be supervised by an official of the agency and a faculty member. Periodic seminars and written reports are required. *Prerequisites: Geography major of junior or senior standing and permission of department head.*

GEOG 496. Senior Project III. 2 credits. *Offered fall and spring.*
Student completes an independent research project, either alone or within an investigative team, to identify and analyze a geographic problem or phenomenon, and provide a written and oral report on the problem analysis and solution. *Prerequisites: GEOG 390 and either GEOG 490, GEOG 491 or GEOG 495.*

GEOG 499. Honors. 6 credits. *Offered fall and spring.*
Year course.

Geology

Department of Geology and Environmental Science

GGEOL 102. Environment: Earth (3, 0). 3 credits.
A study of geological processes causing global change and their impact on human thought. The relationship between some geological processes and life on the Earth is also considered. Not available for major or minor credit in geology. *Prerequisite: GSCI 101.* Formerly GSCI 102. Students may not receive credit for both GGEOL 102 and GSCI 102.

***GEO 110. Physical Geology (3, 2).** 4 credits.
A systematic study of earth materials and the internal and external processes that affect earth structure and landforms. Topics include the genesis/properties of rocks and minerals, plate tectonics and the agents of change that drive surface processes and land form development.

GGEOL 115. Earth Systems and Climate Change. 3 credits.
This course explores cycles, trends and abrupt events in the Earth system. Analyses of the geologic record and global climate models provide perspective for understanding paleoclimate and future climate changes, including global warming. Current hypotheses for causes of climate change are evaluated, including plate tectonics, orbital cyclicity, variations in the sun's strength and human activities. The two re-occurring questions of this class are: What are Earth's climate stories? How do we know? Formerly GSCI 115.

GEO 130. Quantitative Geology. 2 credits.
An introduction to quantitative techniques used in descriptive and predictive aspects of the earth and environmental sciences, with emphasis on algorithmic approaches. The focus is on pragmatic application of mathematical methods to geologic problems, considering requirements, uses and limitations. Automatic computation is stressed.

GEOL 167. History & Philosophy of the Geosciences. 3 credits. *Offered fall.*

As an introductory experience in the Bachelor of Arts in Earth Science, students will be inculcated in the philosophy of geosciences as an interdisciplinary medium for extending classical science viewpoints to complex earth systems. Students will study the geosciences as distinct among sciences, establishing relevance and value of earth science literacy in professional and personal settings.

GEOL 200. Evolutionary Systems (3, 2). 4 credits.

An investment of a theoretical principle behind evolutionary systems of all types based on mathematical modeling in chaos, complexity theory and artificial life studies with extensive computer experimentation and examples drawn from physical, chemical, biological, economic and social systems. The purpose is to explore what is common and universal to all evolutionary processes.

GEOL 211. Introduction to Oceanography. 3 credits.

An introduction to the oceanography of coastal environs including barrier islands, estuaries and tidal marshes. The physical, geological and biochemical characteristics of coastal waters will be discussed in the context of the economic and social pressures brought to bear on these areas by an increasing global population.

GEOL 220. Genetic Mineralogy (2, 2). 3 credits. *Offered fall and spring.*

A study of mineral genesis. Emphasis is directed toward mineralogical environments, mineral associations and the geology/mineralogy of classical localities. An appreciation of mineral value and aesthetics is incorporated throughout the course.

GEOL 230. Evolution of Earth (3, 2). 4 credits.

An introduction to the evidence, methods and assumptions used by scientists to unravel the Earth's origin and history. Emphasis on rock analysis/interpretation, modern and ancient processes of mountain building, origin and evolution of life and the history of the North American continent. *Prerequisite: GEOL 110 or permission of instructor.*

GEOL 272. Planetary Geology. 3 credits.

A survey of currently developing ideas in planetology including origin of the planets, meteorites and planetary interiors. Also included are geologic processes and land forms on the moon and terrestrial planets, their modification under various planetary environments and analogies to familiar earth land forms. *Prerequisite: GGEO 102 or GEOL 110.*

GEOL 280. Mineralogy (3, 2). 4 credits.

A comprehensive study of minerals including: crystallography, mineral chemistry, x-ray diffraction, mineral optics with thin section recognition using petrographic microscope, and hand specimen identification of both silicate and non-silicate minerals. *Prerequisite: GEOL 110.*

GEOL 290. Optical Mineralogy (3, 2). 3 credits.

A study of the optical properties of minerals and mineral identification with the petrographic microscope. *Prerequisite: GEOL 280.*

GEOL 300. Introduction to Petrology (3, 2). 3 credits.

An introduction to the classification and origin of metamorphic and igneous rocks. Laboratory study of hand specimens and thin sections. *Prerequisite: GEOL 280. Corequisite: CHEM 131.*

GEOL 301. Earth Sciences for Teachers. 4 credits. *Offered fall.*

Earth science content is blended with a systems approach to provide pre-service teachers with an understanding of how the Earth works, as well as strategies for teaching it. Major content themes include reconstructing the geologic history of the mid-Atlantic, exploring the interaction of living things and the environment, and predicting how matter and energy circulate in the earth system.

GEOL/GEOG 310 A-D. Environmental Impact. 2-3 credits, repeatable to 6 credits.

Focuses on a selected environmental realm. The course will examine the interface between human activities and environmental systems. It will address the impacts of social, economic and political activities on the environment. GEOL/GEOG 310 A-Atmosphere (air pollution); B-Biosphere (vegetation/wildlife); C-Hydrosphere (water); D-Lithosphere (geologic hazards/land issues).

GEOL 320. Meteorology. 3 credits.

A survey of the science of weather including weather forecasting, weather maps and related atmospheric processes. Emphasis is placed on the dynamic aspects of meteorology and the interrelationships of atmospheric phenomena with land masses and the world ocean.

GEOL 340. Soils and Land Use (2, 2). 3 credits.

The origin, distribution and properties of soils are emphasized in the lecture, laboratory and field. These aspects are used to determine the value of various soil types for such uses as agriculture, forestry, recreation, urban development and structural foundations. *Prerequisites: GEOL 110 and CHEM 131.*

GEOL/BIO 350. Invertebrate Paleontology (3, 2). 4 credits.

The history of nonvertebrate life from its origin, through evolving biogeochemical cycles, origin of eukaryotes and multicellularity, evolutionary records of all major groups and theoretical issues such as major group origins, adaptive radiation patterns, extinctions, functional adaptations and paleoecology. *Prerequisite: GEOL 230, BIO 114 or permission of the instructor.*

GEOL/CHEM 355. Geochemistry of Natural Waters. 3 credits.

Study of chemical theory and reactions important in natural water systems. The role of atmospheric, geologic and biological inputs in determining the geochemistry of streams, rivers and oceans. *Prerequisites: CHEM 131 and CHEM 132 or equivalent.*

GEOL 364. Stratigraphy and Basin Analysis (3, 3). 4 credits.

Lecture emphasizes application of sedimentologic and stratigraphic principles to identify and interpret depositional systems and examines how eustasy (sequence theory) and local tectonics influence the distribution of depositional systems under different plate tectonic regimes. Lab emphasizes critical field observation, application of theory to stratigraphic analysis and writing scientific papers. *Prerequisite: GEOL 230.*

GEOL 365. Structural Geology (3, 2). 3 credits. *Offered fall and spring.*

Major and minor structures of the Earth's crust. Mechanical principles involved in folding, faulting, jointing and pencontemporaneous structures. The causes and results of mountain building processes. Preparation and interpretation of geologic maps. *Prerequisite: GEOL 110; GEOL 230 recommended.*

GEOL 367. Genesis of Solid Earth Materials (2, 2). 4 credits. *Offered fall.*

This course addresses the natural relationship between minerals and the rocks they make up. Using the concept of mineralizing environments, illustrated by classic examples, students will investigate minerals through the processes of mineral genesis and associated rock types. This approach provides insight and predictive value for natural conditions in which specific minerals and rocks occur. Not acceptable for B.S. in geology. *Prerequisite: GEOL 110.*

GEOL 377. Earth Surface Processes (2, 2). 3 credits. *Offered spring.*

The interrelationships among climate, landscapes, soils and bedrock geology are examined using the mid-Atlantic region as a conceptual laboratory. Course instruction includes lecture, laboratory and field trip meetings. The processes of rock weathering and erosion and soil formation are reinvestigated. Topographic maps and aerial photography are examined for landforms and landscape evolution. Not acceptable for B.S. in geology. *Prerequisite: GEOL 230.*

GEOL 385. Geomorphology (2, 2). 3 credits.

The description, classification, analysis, origin and evolution of land forms. The physical and chemical processes that have formed the present landscape. Advanced interpretation of topographic maps. *Prerequisite: GEOL 110 or GEOG 210.*

GEOL 390. Laboratory Techniques in Geology (2, 2). 3 credits.

An elective course for science majors. A study of the basic theories and techniques of laboratory methods and instrumentation. Implementation and application of techniques to geological problems. *Prerequisites: GEOL 280 and permission of the instructor.*

GEOL/MATS 395. Geologic Perspectives in Materials Science & Engineering. 3 credits.

A one-semester course which emphasizes the commonalities between the geological sciences and materials science. Course includes topics from mineralogy, crystallography, petrology and structural geology which are also important in metallurgy and ceramics. *Prerequisites: An introductory course in any physical science or integrated science and technology (GEOL 110, CHEM 131, PHYS 140 or ISAT 141) and at least one additional advanced course in the major.*

GEOL/MATS 396. X-ray Characterization of Solid Materials. 3 credits.

Covers fundamental principles and theory behind two powerful, X-ray based, technologies: X-ray Diffraction and Energy Dispersive Analysis of X-rays (EDS). Students will collect and analyze data from a single crystal Gandolfi X-ray camera, automated powder diffraction system (focusing goniometer), and EDAX system (EDS). *Prerequisite: GEOL 280, MATS/CHEM/PHYS 275 or ISAT 300.*

GEOL 399. Field Geology. 6 credits.

Field methods include use of Brunton compass, telescopic alidade and plane table, and compass traversing. A synthesis of geologic concepts and principles leading to the construction and interpretation of geologic and topographic maps. *Prerequisites: GEOL 364 and GEOL 365 or permission of the instructor.*

GEOL/BIO 405. Vertebrate Paleontology (3, 1). 3 credits.

A study of the origin and evolution of the vertebrates. Emphasis will be on understanding how the processes of earth evolution and biological evolution have interacted through time to produce a coherent picture of vertebrate history. *Prerequisite: GEOL 230, BIO 124 or permission of the instructor.*

GEOL 410. Engineering Geology (2, 2). 3 credits.

Study of the applications of geology to engineering practice. Topics include soil mechanics, foundations, engineering classification of soils, slope stability and mineral aggregates. *Prerequisites: GEOL 340 and either MATH 205 or MATH 235 or equivalent.*

GEOL 415. Geological Evolution of North America. 3 credits.

A systematic survey of the tectonic evolution of the North American continent and the corresponding evolution of depositional basins and paleoenvironments. *Prerequisites: GEOL 364 and GEOL 365 or permission of the instructor.*

GEOL 440. Geophysics (3, 2). 3 credits.

A survey of applied geophysical methods, with particular attention to shallow subsurface investigations. Topics include gravity, magnetics, electrical and electromagnetic techniques, and seismology and ground-penetrating radar. Practical experience with data acquisition, reduction and interpretation. *Prerequisites: GEOL 110 and two semesters of calculus or permission of the instructor.*

GEOL 444. Topics in Geophysics. 3 credits.

An in-depth investigation into selected aspects of geophysics. Topics will be chosen by the instructor and students and may vary from year to year. Some common candidate issues include earthquake seismology, field survey planning and execution, geophysical interpretation theory, and the geophysical underpinnings of plate tectonic theory. *Prerequisite: Permission of the instructor.*

GEOL 450. Geology Seminar. 1 credit.

An in-depth study of a particular problem in geology (e.g., plate tectonics, astrogeology, low-temperature geochemistry, etc.) Scientific literature will be reviewed and discussed. *Prerequisite: 20 credits in geology.*

GEOL 460. Hydrogeology (2, 2). 3 credits.

Basic concepts of subsurface water as a part of the hydrologic cycle. Topics include storativity and permeability in porous media, principles of flow, computer applications, groundwater exploration, and mapping and environmental aspects of groundwater. *Prerequisites: GEOL 110 and two semesters of calculus or permission of the instructor.*

GEOL 467. Stratigraphy, Structure and Tectonics (3, 2). 4 credits. *Offered spring.*

Examination of how stratigraphic, structural and tectonic principles control the character and distribution of rocks. Practical study of principles, regional patterns in sedimentary rocks and stresses the deform rocks are explored in laboratory and field exercises. Topics and techniques are discussed within the framework of the 1.2 billion year geologic history of the Virginia region and its connection with the tectonic processes through the rest of the world. Not acceptable for B.S. in geology. *Prerequisites: GEOL 110 and GEOL 230.*

GEOL 477. Contemporary Issues in the Geosciences. 3 credits.

Offered spring of alternate years.

As a capstone experience, this course serves as an opportunity for students to view issues of the Earth system from an Earth-based perspective. Building on previous course work in the major (physical geology, meteorology, oceanography, etc.), students will investigate such issues as global warming, population and sustainable development and environmental ethics. Particular emphasis is placed upon the Earth's perspective from a historical viewpoint. *Prerequisites: GEOL 211, GEOL 320, GEOL 367 and GEOL 377.*

GEOL 489. Quantitative Methods in Geology (3). 3 credits.

An introduction to the mathematical methods and statistical techniques that are employed by scientists in the disciplines of geochemistry, geophysics, hydrology and the petroleum/mineral industry. The course provides the quantitative skills necessary to manipulate geological data.

GEOL 491. Geological Literature Research. 3 credits.

Provides instruction in the definition of a geological problem, sources and strategies for a literature search and the preparation of both written and oral reports. *Prerequisites: Geology major (senior standing) and permission of the instructor.*

GEOL 494. Internship in Geology. 1-3 credits.

Student conducts a research or applied project in geology outside of the university. Requires an approved proposal prior to registration and a final report at the culmination of the project. *Prerequisites: Minimum of eight credit hours in geology and a geology GPA of 2.5 or higher.*

GEOL 497. Problems in Geology. 1-3 credits each semester.

An undergraduate research course in one of the fields of geology. Open to advanced students who have adequate preparation. *Prerequisite: Permission of the instructor.*

GEOL 499. Honors in Geology. 6 credits.

Three semester sequence. *Prerequisite: 3.25 GPA or higher.*

German

Department of Foreign Languages, Literatures and Cultures

GER 101-102. Elementary German (4, 1). 4 credits each semester.

Offered fall and spring.

The fundamentals of German through listening, speaking, reading and writing. Practice in pronunciation and development of comprehension. One hour's work a week in the language laboratory.

GER 111-212. Intensive German. 6 credits each term. *Offered May and summer.*

The fundamentals of German through listening, speaking, reading and writing. The first semester is the equivalent to GER 101-102 and the second is the equivalent to GER 231-232.

GER 231-232. Intermediate German. 3 credits each semester. *Offered fall and spring.*

A thorough review of grammar, vocabulary building, conversation, composition and reading. *Prerequisite: One year of college German or equivalent.*

GER 266. Contemporary German Literature in Translation. 3 credits.

Offered fall and spring.

German literature from the 1920s to the present. All lectures and readings are in English. Does not count toward a major, minor or licensure in German.

GER 300. German Grammar and Communication. 3 credits. *Offered fall and spring.*

Intensive training in grammatical structures and their application to oral and written communication. Instruction is in German. Fulfills the College of Arts and Letters writing-intensive requirements for the major. *Prerequisite: GER 232 or equivalent.*

GER 307. A History of German Civilization. 3 credits. *Offered fall and spring.*

A study of society, economics, politics and the arts in central Europe from Indo-European beginnings to the 1900s. Emphasis is also placed on outstanding contributions of German-speaking people. Instruction is in German. *Prerequisite: GER 300 or equivalent.*

GER 308. Contemporary German Civilization. 3 credits. *Offered fall and spring.*

A study of life, culture, politics and economics in modern Germany. May be repeated for credit. *Prerequisite: GER 300 or equivalent.*

GER 320. German Oral and Written Communication. 3 credits. *Offered fall and spring.*

Intensive training in the use of modern, everyday German with emphasis on conversation and composition. Readings in German will provide a context for discussion and writing. *Prerequisite: GER 300 or equivalent.*

GER 330. Business German. 3 credits. *Offered fall and spring.*

A study of commercial and trade vocabulary and customs in conjunction with practice in commercial communication, including letter writing, interviews and interpretation. Instruction is in German. *Prerequisite: GER 300 or equivalent.*

GER 335. Introduction to German Literature. 3 credits. *Offered fall and spring.*

A survey of German literature from 750 to the present. Textual analysis of sample writings of the most important literary movements. Instruction is in German. *Prerequisite: GER 300 or equivalent.*

GER 341. German-English Technical/Commercial Translation. 3 credits.

Offered fall and spring.

German-English translation applied in several commercial (i.e., marketing, finance) and technical (i.e., electricity and electronics, software, hardware) fields. Focus will be on the acquisition of specialized knowledge (both linguistic and extralinguistic) and the delivery of professional documents in real-market conditions. Fulfills the College of Arts and Letters writing-intensive requirement for the major. *Prerequisite GER 300 or equivalent.*

GER 400. Advanced Conversation. 3 credits. *Offered fall and spring.*
Discussions deal with topics of current interest. *Prerequisite: GER 300 or equivalent.*

GER 405. The Age of German Classicism. 3 credits. *Offered fall and spring.*
Reading and interpretation of significant works of Lessing, Schiller and Goethe. Instruction is in German. *Prerequisite: GER 300 or equivalent.*

GER 415. German Romanticism and Realism. 3 credits. *Offered fall and spring.*
A study of Romanticism and Realism with emphasis on Romantic poetry and the Realistic novel. Instruction is in German. *Prerequisite: GER 300 or equivalent.*

GER 426. Modern German Literature. 3 credits. *Offered fall and spring.*
A study of the works of major German writers of the 20th century. Instruction is in German. *Prerequisite: GER 300 or equivalent.*

GER/ENG 436. Studies in German Literature. 3 credits. *Offered fall and spring.*
A study of selected works of German literature. Instruction is in English. May be repeated for credit when course content changes.

GR 446. Special Topics in Linguistics, Literature or Civilization.
3 credits. *Offered fall and spring.*

Study of a particular topic in German linguistics, literature or civilization. May be taught in English or in the language but cannot be counted for the major, minor or licensure unless taught in the language. *Prerequisite: GER 300 or equivalent.*

GER 465. German Cinema. 3 credits. *Offered fall.*
An analysis of the German cinema from the 1920s through the present. Emphasis will be on the relations between the German film and certain seminal periods in German history. *Prerequisite: GER 300 or equivalent.*

Graphic Design

School of Art and Art History

GRPH 200. Computer Graphics (0, 6). 3 credits. *Offered fall and spring.*
Introduction to graphics on the computer. Students will explore hardware and software that relate to the presentation of graphic design projects and computer generated imaging. *Prerequisites: ART 102 and ART 104 or permission of the instructor.* Formerly GRPH 243.

GRPH 202. Design Methodology (0, 9). 3 credits. *Offered fall and spring.*
Exploration of strategies for conceptualizing, analyzing and solving design problems. Emphasis is placed on graphic presentation of ideas and the creative process. *Prerequisite: ART 102.* Formerly GRPH 244.

GRPH 206. Introduction to Typography (0, 9). 3 credits. *Offered fall and spring.*
Introduction to the study of letter forms for their aesthetic and communicative value. Emphasis will be placed on the form and function of basic type including a fundamental understanding of electronic prepress. *Prerequisite: GRPH 200.* Formerly GRPH 246.

GRPH 208. Portfolio Review. 0 credit. *Offered fall and spring.*
Portfolio review required to enroll in graphic design courses at upper division standing. May be repeated once for pass/fail standing. *Prerequisites: GRPH 200 and GRPH 202. Prerequisite or corequisite: GRPH 206.* Formerly GRPH 250.

GRPH 300. Illustration (0, 9). 3 credits. *Offering varies.*
Through demonstrations, theory and practical application, students are introduced to numerous media and illustrative techniques. Encouraged experimentation is tempered by an understanding of problem solving and conceptualization. *Prerequisite: GRPH 208.* Formerly GRPH 349.

GRPH 304. Package Design (0, 9). 3 credits. *Offering varies.*
Through theory, demonstrations and practical application, students learn to design in three-dimensions. Focus will be placed on aesthetics, as well as the form and function of a product's housing. *Prerequisite: GRPH 208.* Formerly GRPH 347.

GRPH 306. Intermediate Typography (0, 9). 3 credits. *Offered fall and spring.*
Continued study of letter forms for their aesthetic and communicative value. Emphasis will be placed on historical and sociological issues. *Prerequisite: GRPH 208.* Formerly GRPH 346.

GRPH/SMAD 312. Web Design. 3 credits. *Offered fall and spring.*
Introduction to Web design through theory and practical application. Assignments will focus on the unique form, content and structures associated with designing for the World Wide Web. Special emphasis on the creative process and the graphic presentation of ideas. *Prerequisites: GRPH majors: GRPH 208; SMAD majors: SMAD 202.* Formerly GRPH 339.

GRPH 340. Poster Design (0, 9). 3 credits. *Offering varies.*
Through theory and practical application, students learn to design for the poster realm. Focus will be placed on aesthetics, as well as form and function. Encouraged experimentation is tempered by an understanding of problem solving and conceptualization. *Prerequisite: GRPH 208.*

GRPH 390. Independent Studies in Graphic Design. 1-3 credits.
Offering varies.

Independent activity at the intermediate level, such as research or studio practice, under faculty supervision. Projected studies in any area of the school's offering must be arranged with the instructors who will direct them. Offered only with the consent of the director. *Prerequisite: GRPH 208.*

GRPH 392. Topics in Graphic Design. 3 credits. *Offering varies.*
Study of selected topics in art, art education, art history, graphic design, interior design or industrial design at the intermediate level. May be repeated when course content changes. See e-campus for current topics. *Prerequisite: GRPH 208.* Formerly GRPH 389.

GRPH 406. Advanced Typography (0, 9). 3 credits. *Offered fall and spring.*
Advanced study of letter forms for their aesthetic and communicative value. Emphasis will be placed on creative solutions reflecting knowledge of contemporary typography and design issues. *Prerequisite: GRPH 306.* Formerly GRPH 446.

GRPH 408. Type and Image (0, 9). 3 credits. *Offered fall and spring.*
This course emphasizes creative solutions of type and image in visual communication. *Prerequisite or corequisite: GRPH 406.* Formerly GRPH 447.

GRPH 410. Graphic Design Portfolio. 3 credits. *Offered fall and spring.*
An examination of the business of graphic design, employment strategies and freelance opportunities. Focus is placed on solidification of the portfolio for employment and/or graduate school. This course is strongly recommended for the last semester prior to graduation. *Prerequisite: GRPH 406. Corequisite: GRPH 408.* Formerly GRPH 498.

GRPH 490. Independent Studies in Graphic Design. 1-3 credits, repeatable. *Offered fall and spring.*
Independent activity, such as research or studio practice, under faculty supervision. Projected studies in any area of the school's offering must be arranged with the instructors who will direct them. Offered only with consent of the director. *Prerequisite: GRPH 208.*

GRPH 491. Studio Assistant. 1-3 credits, repeatable. *Offered fall and spring.*
An on-campus program monitored on an individual basis designed to provide practical studio experience in the visual arts. Students will learn safe studio practices and management skills, including material use, inventory control, and the proper operation of equipment found within various individual classroom studios. *Prerequisites: Permission of the instructor.*

GRPH 492. Topics in Graphic Design. 3 credits. *Offered fall and spring.*
Study of selected topics in graphic design at the advanced level. May be repeated when course content changes. See e-campus for current topics.

GRPH 496. Internship in Graphic Design. 1-8 credits. *Offered fall and spring.*
An off-campus program prepared and monitored on an individual basis. Internships are designed to provide practical experience in the arts. *Prerequisites: Permission of the instructor. ARTH 494 if in museums and galleries.* GRPH 208.

GRPH 499. Honors (1, 3, 2). 6 credits total for three semesters. *Offered fall and spring.*
Prerequisite: GRPH 208.

Gerontology

Department of Social Work

GERN/SOCI 280. Social Gerontology. 3 credits. *Offered fall and/or spring.*
An interdisciplinary introduction to the study of aging. The course provides an overview of issues surrounding aging in contemporary society: personal, familial, communal and societal.

GERN 305. Programs and Services for the Elderly. 3 credits. *Offered fall.*
A review of the programs and services provided for the elderly in the public and private sectors of America. Observations and participation in local programs for the elderly will be required. *Prerequisite: GERN/SOCI 280.*

GERN/FAM/SOWK 375. Grant Writing for Agencies. 3 credits. *Offered on a rotating basis.*

Emphasizing active learning, this course teaches the basics of grant and proposal writing. Efficient research, persuasive prose and the importance of relationships are stressed. Private and corporate philanthropy are examined with guest speakers providing current insights. Students research, write and complete a funding proposal.

GERN 400. Skills and Techniques in Gerontological Assessment. 3 credits. *Offered spring.*

The study of the skills and techniques used in assessing the elderly client. Assessment is made from the holistic approach: physical, psychological and social. *Prerequisite: GERN/SOCI 280.*

GERN 487. Special Topics in Gerontology. 3 credits. *Offered on a rotating basis.* Examination of selected topics in gerontology that are of current importance in the field of gerontology. Course may be repeated for credit.

GERN 490. Special Studies in Gerontology. 1-3 credits. *Offered fall and spring.* Independent study in gerontology under faculty supervision. Limited to gerontology minors. Can be repeated for credit. *Prerequisites: GERN/SOCI 280, GERN 305 and GERN 400 or permission of instructor.*

GERN 495. Field Experience/Seminar in Gerontology (1, 6). 3 credits. *Offered fall, spring and summer.*

Supervised field experience in gerontology settings that allows observation and experience with the well and frail elderly. A minimum of six hours in the assigned setting each week and one hour seminar on campus. *Prerequisites: GERN/SOCI 280, GERN 305 and GERN 400, major elective, and approval of the gerontology minor adviser.*

Greek

Department of Foreign Languages, Literatures and Cultures

GRK 101-102. Elementary Greek. 4 credits each semester. *Offered fall and spring.* Designed to provide a reading knowledge of Classical Greek as well as New Testament koine. Greek life, thought and culture are stressed. Especially recommended for science, English and philosophy majors.

GRK 231-232. Intermediate Greek. 3 credits each semester. *Offered fall and spring.* An intensive reading course. Selections from Classical Greek writers and/or the New Testament. *Prerequisite: One year of college Greek or equivalent.*

Health

Department of Health Sciences

GHTH 100. Personal Wellness. 3 credits. *Offered fall and spring.* Emphasizes lifestyle behaviors contributing to health promotion and disease prevention. General areas affecting health status are identified and suggestions made as to how health-related behaviors, self-care and individual decisions contribute to wellness and influence dimensions of health. A one-hour weekly individual physical wellness lab is included.

HTH 151. Foundations of the Health Sciences. 3 credits. *Offered fall and spring.* Review of the basic competencies and foundations of the health sciences including academic planning, professionalism, writing and presentation skills, information literacy, foundational principles, and the roles and responsibilities of selected health science fields. This is intended to be the first course that a student takes in the health sciences major.

****HTH 204. Emergency Health Care (2, 2).** 3 credits. *Offered fall and spring.* A survey of various dimensions of the legal aspects of emergency care, cardiorespiratory emergencies, hemorrhage control, wounds, shock, heat injuries and other health emergencies. Selected American Red Cross and American Heart Association certifications available.

** The American Red Cross registration fees apply.

HTH 206. Advanced Athletic Training. 3 credits. *Offered fall and spring.* This course involves advanced study of injuries associated with physically active individuals including injury mechanisms, signs and symptoms, and treatments. Other topics include relationships athletic trainers build with other health care professionals; environmental issues related to physical activity; and special needs of various populations. *Prerequisites: BIO 290 and HTH 205.* Formerly HTH 303.

HTH 230. Community Health. 3 credits. *Offered fall and spring.* An introduction to community health including its foundations, the tools of community health such as epidemiology, community organization, disease control, and health promotion. The course focuses on the populations, settings, and special issues of community health. *Prerequisites: GHTH 100.*

HTH 252. Sexually Related Diseases. 1 credit. Sexually transmitted diseases and other sexual systems problems (breast and testicular cancer), nonvenereal diseases, chromosomal anomalies, sexual disorders of the genitalia and urinary system problems.

HTH 270. Personal Health Promotion. 3 credits. A survey of principles for the promotion of optimum individual, family and community health through intelligent self-direction of health behavior. Topics include the physical, mental and social dimension of health economics, disease control, human sexuality, chemical abuse, injury control, and nutrition.

HTH 278. Alcohol: Use and Abuse. 1 credit. Survey of the drug alcohol. Topics include pharmacological effects, patterns of use, potential for abuse, treatment programs and prevention of alcohol abuse and alcoholism.

HTH 300. Medical Terminology. 3 credits. *Offered fall and spring.* Study of terms that relate to body systems, anatomical structures, medical processes and procedures, and a variety of diseases disorders that afflict human organisms.

HTH 308. Therapeutic Assessment. 3 credits. *Offered spring.* The purpose of this course is to present an overview of established and current knowledge in the major content areas in therapeutic assessment by examining the impact of work and the working environment on human body systems as they relate to health and wellness. *Prerequisite: BIO 290.*

HTH/KIN 312. The Profession of Teaching Health & Physical Education. 2 credits. *Offered fall and spring.*

Introductory study of the roles of the teacher and the learner and the pedagogical content knowledge of health and physical education. An in-depth examination of the unique position and qualifications of the specialist in physical education and health. Systematic observations will occur. *Prerequisite: Admission to teacher education.*

HTH/HHS/NSG/SOWK 314. Rural Health: An Interdisciplinary Approach. 3 credits. *Offered May.*

Students study, observe and participate in interdisciplinary assessment, planning and delivery of community-based primary health care in partnership with residents and agencies of a host rural county. Learning activities will emphasize rural culture, rural health care and interdisciplinary practice.

HTH 320. Statistical Methods for Health Science Research. 3 credits. *Offered fall and spring.*

This course reviews statistical concepts and techniques with special reference to their relation to health science applications and issues. It also reinforces the logical processes associated with statistical decision making, again with particular reference to health and medical research methods. *Prerequisites: MATH 220 and HTH 354.*

HTH 330. Introduction to Human Disease. 3 credits. *Offered fall and spring.* An overview of the incidence, prevalence, causation, and prevention of the major chronic and infectious diseases which are currently of concern in the twenty-first century. Major signs and symptoms of the diseases as well as treatment will be reviewed. The course will also cover the body's defense system and the principles of disease occurrence. *Prerequisites: HTH 230.*

HTH 352. Environmental Health. 3 credits. *Offered fall and spring.* An investigation of environmental factors and their effects on the health of the individual, community and society. *Prerequisite: HTH 230.*

HTH 354. U.S. Health Care System. 3 credits. *Offered fall and spring.* This course examines the structure and organization of the health care delivery system in the United States. The components, functions, financing and resources of this system are described.

HTH 355. AIDS and Other Sexually Transmitted Diseases. 1 credit. *Offered fall and spring.*

Discussion includes theories of origins, statistics and characteristics of the causative pathogen, incubation, illness patterns, transmission, prevention and treatment of AIDS and other STDs. AIDS and other STDs in relation to prisons, children, schools, global concerns, health care systems and legal factors will be considered.