

HUMAN GEOGRAPHY

(BA candidates select two systematic and one regional course.)

Systematic

2010 Human Geography (3) Survey of patterns and processes of world's cultures and landscapes.

2080 Humans and the Environment (3) Exploration of geographic concepts that underlie nature-society relationships and human-dimensions of environmental change.

4012 Elements of Cultural Geography (3) Culturally oriented proseminar in American geographical thought during the present century.

4060 Political Geography (3) Systematic, cultural-political geography; emphasis on technical and philosophical aspects and on American political landscapes; territorial political entities (cadastral, civil, national, imperial); role of the lands and seas, nature and objects of war; impacts of political entities on the landscape.

4072 Urban Historical Geography (3) Spatial evolution of cities and city-systems in western civilization through the classical, medieval, mercantile, and industrial periods to 1945.

4073 Urban Geography (3) Internal arrangement, external relations, and locational aspects of urban places, with emphasis on U.S.; urban places identified by presence of tertiary economic activities.

4074 Place and Culture (3) See ANTH 4074.

4077 Economic Geography (3) Location, characteristics, and relationships of primary, secondary, and tertiary economic activity; measurements and theories of location of economic endeavor.

4078 Environment and Development (3) Geographic theories and methods for analyzing relationship between environment and development.

4079 Geography of Religion (3) Also offered as REL 4079. Theory and methods of analyzing the culture and movement of religious rituals and traditions over space and time.

4080 Historical Geography (3) Advanced concepts and principles of historical geography.

4086 Human-Environment Interactions (3) Also offered as ANTH 4086. Cultural adaptation to difficult and distinctive environments, including mountains and highlands, the arctic, deserts, the humid tropics, and grasslands; subsistence strategies, local knowledge, household economies, land use practices, and resource management institutions.

4087 Gender, Place, and Culture (3) Also offered as ANTH 4087 and WGS 4087. The geographies of everyday life showing how notions of maleness and femaleness influence how we understand and relate to the world around us, from our built environment, to the places we invest with meaning, and the very ways we live, work, travel, and explore.

Regional

3001 Geography of Louisiana (3) Development and current distribution of physical and human geography of Louisiana.

4000 Modern India: Society and Culture (3) See SW 4000.

4002 South Asian Society, Polity, and Culture (3) See INTL 4002.

4031 Latin America and the Caribbean (3) Physical and cultural geography of Latin America and the Caribbean.

4033 Geography of Central Asia and Afghanistan (3) Also offered as INTL 4033. Survey of the geography of Central Asia and Afghanistan; emphasis on geographic elements of the history, ecology, environment, economy, and strategic importance of the region.

4035 Geographical Survey of East Asia (3) General survey of the physical and cultural geography of the region; focus on economic development and international relations.

4037 Geography of China (3) Geographic survey of natural environment, population and economy of China and its relationships to the rest of the world.

4050 Historical Geography of the South (3) Physical and cultural geography of the southern U.S.; emphasis on geographical elements identified with the south and their historical development; environment, exploration, population, agriculture, and cultural landscape.

4051 North Africa and the Middle East (3) Also offered as INTL 4051. Survey of the geography of North Africa and the Middle East; emphasis on the geographic elements of the history, ecology, economy, and politics of the region.

4052 Geography of the United States and Canada (3) Physical and cultural geography of the United States and Canada.

4055 Geography of Europe (3) Geographical survey of the natural, cultural, and economic resources of Europe and their relationships to the rest of the world.

PHYSICAL GEOGRAPHY

(BS candidates select any three courses.)

Climatology

4013 Meteorology (3) Prereq.: GEOG 2050 or equivalent. May be taken for elective geology credit. Temporal and areal variations in composition and structure of the atmosphere; meteorological instruments and measurements.

4014 Climatology (3) Prereq.: GEOG 2050 or equivalent. Climatic phenomena; methods in development of regional climatology.

4015 Physical Climatology (3) Prereq.: GEOG 4013 or 4014 or equivalent and MATH 1552 or equivalent. Also offered as ENVS 4015. May be taken for elective geology credit. Exchanges of radiation, energy, matter and momentum between the earth's surface and the atmosphere that produce characteristic environmental conditions near the ground important to both rural and urban land uses.

4016 Methods of Climatological Analysis (3) Prereq.: GEOG 4013 or GEOG 4014 or equivalent. Analysis and interpretation of climatological data and application to physical and human problems.

4017 World Climates (3) Prereq.: GEOG 2050 or equivalent. Analysis of atmospheric circulation processes that produce differences in climates throughout the world; the earth's problem climates and climatically sensitive zones most susceptible to floods, droughts, and other environmental stresses.

4018 Geographical Hydrology (3) Prereq.: MATH 1021 or equivalent. 2 hrs. lecture; 2 hrs. lab. Analysis of basic hydrologic processes with geographical perspective; variability of runoff and groundwater; floods and droughts; climatic and land use impacts on local and global water resources.

4221 The Tropical Atmosphere (3) Prereq.: GEOG 4013 or 4014. Comparative analysis of the tropical and mid-latitude atmospheric circulation systems, including monsoon systems, tropical cyclones, and easterly waves; elements of interannual tropical variability such as El Niño-Southern Oscillation.

Biogeography and Environment

2000 Hazards Disasters and the Environment (3) See DSM 2000.

4070 Environmental Conservation (3) Factors governing human use of the earth and its resources.

4082 Biogeography (3) Different approaches to description and interpretation of plant and soil distribution patterns.

4083 Quaternary Paleogeology (3) Prereq.: GEOG 2050 and GEOG 2051 or GEOL 1001 and 1003 or consent of the instructor. Also offered as ANTH 4083. Theory of climatic variability on orbital to inter-annual time scales and the methods of reconstructing ecological and climatic variability with biological, geological, and historical archives.

4085 Tropical and Subtropical Biogeography (3) Prereq.: GEOG 4082 or equivalent. Includes field trip during spring vacation. Principles of tropical ecology and biogeography taught as preparation for an expedition to tropical America where field methods will be illustrated and ecological diversity studied.

OTHER COURSES

2061 Physical Geography (3) Either GEOG 2050 or 2051 may be substituted for this course. Credit will not be given for both this course and GEOG 2050 or 2051. Analysis of landforms, hydrology, climate, vegetation, and soil; emphasis on world regional patterns.

4023 Coastal and Shallow-Marine Depositional Systems (3) See GEOL 4023. May be taken for elective geology credit.

4024 Coastal Morphodynamics. See OCS 4024.

4090 The History of Geography (3) 3 hrs. lecture and proseminar discussion. Development of geography since ancient times; emphasis on the 19th and 20th centuries.

4164 Deltaic Geology (3) See GEOL 4164.

4997 Special Topics in Geography (3) Permission of instructor. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4998 Independent Reading and Research in Geography (1-6) Permission of instructor. May be repeated for credit. An honors course, GEOG 4999, is also available. Credit will not be given for this course and GEOG 4999. Supervised reading or research on topics selected by qualified advanced students.

4999 HONORS: Independent Reading and Research in Geography (1-6) Permission of instructor. Same as GEOG 4998, with special honors emphasis for qualified students. Credit will not be given for this course and GEOG 4998.

7074 Poetics of Place (3) Same as ANTH 7074.

7901 Introduction to Graduate Study (1) Same as ANTH 7901. Techniques and methods of their profession for

incoming graduate students.

7902 Introduction to Research Methods in Geography (3)

7906 Settlement Geography: Exploration (3) May be taken for a max. of 9 hrs. of credit with consent of department.

7910 Form-Process Relationships in Coastal Environments (3) V

7911 Selected Topics in Geography (3) Permission of instructor. May be taken for a max. of 9 hrs. when topics vary.

7917 Advanced Physical Geography (3) May be taken for a max. of 9 hrs. of credit with consent of department.

7921, 7922, 7923 Research and Field Work in Geography (3-6 each) Permission of instructor. Each course may be repeated for credit.

7926 Advanced Geomorphology (3) May be taken for a max. of 9 hrs. of credit with consent of department.

7935 Quantitative Methods for Geographical Analysis (3) Prereq.: EXST 7003 or equivalent. Spatial analytical methods for handling and interpreting data related to geography.

7936 Advanced Qualitative Research in Geography and Anthropology (3) Also offered as ANTH 7936. Explores the varied tools, techniques, and methodologies of qualitative inquiry. Students gain practical experience creating and working with multiple forms of qualitative data and engaging in qualitative analysis and interpretation.

7937 Geographical Literature (3)

7938 Culture History (3) May be taken for a max. of 9 hrs. of credit with consent of department.

7939 Seminar in Cultural Geography (3) May be repeated for max. of 9 sem. hrs. credit when topics vary.

Explores different theoretical, methodological, and empirical approaches in cultural geography.

7942 Coastal Climatology (3) Prereq.: GEOG 4028 and a basic course in either meteorology or climatology, or consent of instructor. Meteorologic and climatologic phenomena occurring in coastal areas.

7946 Coastal and Estuarine Resources (3) Prereq.: GEOG 4028 and 4029; or equivalent. Nature of coastal and estuarine resources and their perception, evaluation, and exploitation.

7950 Problems in the Geography of Latin America (3) Prereq.: reading knowledge of Spanish or Portuguese. Problems in the cultural and economic geography of Latin America.

7960 Hydroclimatology (3) Prereq.: GEOG 4014 or 4015 or equivalent. 1 hr. lecture; 4 hrs. lab. Field measurements and laboratory analyses of radiation and water budgets in rural and urban environments; emphasis on evapotranspiration rates and climatic consequences.

7973 Advanced Geographic Information Systems (3) Prereq.: GEOG 4047 or equivalent. Theory and methods of design, development, implementation, and applications of geographic information systems.

7975 Advanced Remote Sensing Seminar (3) V Prereq.: GEOG 4045 or equivalent. May be taken for a max. of 9 sem. hrs. of credit when topics vary. Selected topics in remote sensing.

8000 Thesis Research (1-12 per sem.) Permission of instructor. "S"/"U" grading.

9000 Dissertation Research (1-12 per sem.) Permission of instructor. "S"/"U" grading.

GEOLOGY • GEOL

General education courses are marked with stars (★).

★ **1001 General Geology: Physical (3)** An honors course, GEOL 1002, is also available. Credit will not be given for both this course and GEOL 1002 or 1111. Earth materials and land forms; processes at work on and within the earth.

★ **1002 HONORS: General Geology: Physical (3)** Same as GEOL 1001, with special honors emphasis for qualified students. Credit will not be given for both this course and GEOL 1001 or 1111.

★ **1003 General Geology: Historical (3)** Prereq.: GEOL 1001. An honors course, GEOL 1004, is also available. Credit will not be given for this course and GEOL 1004. History of the earth and life on it, as deciphered from study of its rocks and fossils.

★ **1004 HONORS: General Geology: Historical (3)** Same as GEOL 1003, with special honors emphasis for qualified students. Credit will not be given for this course and GEOL 1003.

★ **1066 Dinosaurs, Catastrophes, and Extinctions (3)** Not for major credit for geology majors. History of dinosaur discoveries and methods of study; dinosaurs' relationship to birds and mammals; place of dinosaurs in earth's geological history; emphasis on catastrophes and patterns of extinction.

1111 Geology of National Park Areas (3) *Credit will not be given for this course and either GEOL 1001 or GEOL 1002.*

Geological study of areas supervised by the National Park Service. Areas covered will include most of the National Parks and Monuments, and many other federally owned lands.

★ **1601 Physical Geology Laboratory (1)** *Prereq.: credit or concurrent enrollment in GEOL 1001. Lab related to GEOL 1001.* Properties of minerals and rocks; practical application of geological principles, using topographic and geological maps; geological factors relating to energy exploration and environmental problems, with emphasis on south Louisiana.

★ **1602 Historical Geology Laboratory (1)** *Prereq.: GEOL 1601; credit or concurrent enrollment in GEOL 1003. Lab related to GEOL 1003.* Sedimentary rocks and environments, geobiological sequences, fossils, and the historical geological record as interpreted from maps.

2020 Geology and the Environment (3) *Prereq.: GEOL 1001.* Interaction between human activities and geological processes, hazards, and materials; emphasis on environmental geology of Louisiana and the Gulf Coast region.

2061 History of the Biosphere (3) *Prereq.: GEOL 1003, 1602; BIOL 1201. 2 hrs. lecture; 3 hrs. lab. One or two field trips required.* Characteristics and geologic history of selected taxa with significant fossil records; use of paleontological data (paleobiologic, paleoenvironmental, geochemical, and biostratigraphic) in geology and evolutionary studies; influence of the biosphere on Earth over geologic time.

2081 Mineralogy (3) *Prereq.: GEOL 1001, 1601, CHEM 1201, 1202, or consent of instructor. 2 hrs. lecture; 3 hrs. lab. Credit will not be given for this course and GEOL 3200.*

Elementary crystallography; mineral identification; general chemical and physical properties of minerals; environments of minerals.

3032 Introduction to Sedimentology and Depositional Environments (3) *Prereq.: GEOL 1001, 1003, 1601, or equivalent; GEOL 2081; or consent of instructor. 2 hrs. lecture; 2 hrs. lab. Credit will not be given for this course and GEOL 3200. One field trip and one field exercise in nearby area.* Sediment types, textures, sedimentary structures, and major minerals used to understand sedimentary processes leading to different depositional environments.

3041 Igneous and Metamorphic Petrology (4) *Prereq.: GEOL 2081. 3 hrs. lecture; 3 hrs. lab. Credit will not be given for this course and GEOL 3200.* Classification, theoretical background, and tectonic processes related to development of igneous and metamorphic rocks; and optical petrographic methods.

3071 Structural Geology (4) *Prereq.: GEOL 1003, 1602; credit in MATH 1550. 2 hrs. lecture; 3 hrs. lab and a one week field-based project.* Geometric, kinematic, and dynamic analysis of geologic structures and structural systems resulting from deformation; introduction to tectonics; introduction to field techniques and geologic maps; generation of geologic maps and cross-sections.

3200 Earth Materials for Petroleum Engineers (3) *Prereq.: GEOL 1001 or 1002, GEOL 1003, and GEOL 1601; 2 hrs. lecture; 3 hrs. lab. Credit will not be given for this course and GEOL 2081 or GEOL 3032 or GEOL 3041. May not be taken by geology majors for credit.* Introduction to the classification, occurrence, and origin of rocks and rock forming minerals.

3666 Field Geology (6) Su only *Prereq.: GEOL 3032, 3041, and 3071; or equivalent. Students planning to take this course should apply to the camp director no later than March 15. Camp fee.* Six weeks of field-based projects in the Rocky Mountains of Colorado, New Mexico, and Wyoming; fundamentals of the study of rocks and geologic features in their natural settings.

3909 Geological Research (1-3) F,S,Su *May be taken for a max. of 9 sem. hrs. of credit when topics vary.* Primarily for geology majors. Directed reading, conference, and field/laboratory investigations of geological problems.

3999 Undergraduate Thesis in Geology (3) *Prereq.: GEOL 3909; consent of department. Defense committee of three faculty members must be approved by the department. Pass-fail grading.* Individual research on problems in the geological sciences. Includes writing, public presentation, and defense of a research thesis.

4002 Special Topics in Geology and Geophysics (3) V *Prereq.: senior standing in geology or consent of instructor. May be taken for a max. of 9 sem. hrs. of credit when topics vary.* Advanced and/or emerging topics in the geosciences.

4012 Introduction to Micropaleontology (3) *Prereq.: GEOL 2061 or equivalent. 2 hrs. lecture; 3 hrs. lab.* Morphology, classification, stratigraphy, paleoecology, and evolutionary patterns of common marine microfossils.

4019 Geomorphology (4) *Prereq.: GEOL 1001 or ANTH 2015 or GEOG 2051 or permission of instructor. 3 hrs. lecture plus equivalent of 3 hrs of lab per week devoted to an applied fieldwork problem. Also offered as ANTH 4019.* Geological, stratigraphical, geochemical, and geophysical

techniques employed in the study of archaeological sites and materials.

4023 Coastal and Shallow-Marine Depositional Systems (3) *Also offered as GEOG 4023.* Dynamics of sediment transport in coastal zones and on continental shelves; sea-level changes; morphological, sedimentary, and stratigraphic attributes of coastal and shallow-marine lithosomes.

4035 Advanced Sedimentology (3) *Prereq.: GEOL 3032. Field trip required.* Physical sedimentary processes in nonmarine and marine depositional systems, including fluvial, alluvial fan, lacustrine, eolian, and carbonate and clastic marine environments; influence of tectonics, climate, and sea level on sedimentary architecture and sequences.

4043 Earth Materials and the Environment (3) *Prereq.: CHEM 1202, GEOL 1001, 2081 or permission of instructor.* Earth materials as problems and solutions in environmental issues; physicochemical behavior of asbestiform silicates, silica, zeolites, and associated health hazards; potential geological repositories for hazardous waste.

4044 Petroleum Geology (3) *Prereq.: GEOL 2061, 3071, and MATH 1550.* Modern concepts of the origin, migration, entrapment and production of hydrocarbons from sedimentary basins.

4045 Stratigraphy (3) *Prereq.: GEOL 3032 or permission of instructor.* The succession and age relationships of rock strata including their form, lithologic components, fossil content, geophysical and geochemical properties and their interpretation in terms of environment, mode of origin, and geologic history.

4062 Exploration and Environmental Geophysics (3) *Prereq.: GEOL 3071 and MATH 1552 or permission of instructor. 2 hrs. lecture; 3 hrs. lab.* Principles and methods of acquisition, processing, and interpretation of geophysical data used to investigate the shallow subsurface; seismic refraction, seismic reflection, gravity, magnetics, electrical resistivity, well logs, and ground penetrating radar.

4064 Solid Earth Geophysics (3) *Prereq.: GEOL 3071 and MATH 1552.* Concepts and methods used to study the structure and dynamics of the earth; rotation, gravity, seismology, heat flow, geomagnetism, paleomagnetism, radioactivity, and deformation.

4066 Plate Tectonics (3) *Prereq.: GEOL 3071.*

Contemporary concepts of plate tectonics; geophysical observations and geological implications.

4068 Reflection Seismology (3) *Prereq.: PHYS 1201 or 2101, MATH 1550, or consent of instructor. 2 hrs. lecture; 3 hrs. lab.* Seismic reflection techniques used to investigate shallow earth structure; waves in layered media, correlation, convolution, deconvolution, and spectral analysis; interpretation of seismic record sections.

4071 Advanced Structural Geology (3) *Prereq.: minimum of 20 hrs. in geology courses, including GEOL 3071. 2 hrs. lecture, 3 hrs. lab.* Structural geology of the U. S.; its application to problems of folding, faulting, rock mechanics, and plate interactions.

4081 Chemical Oceanography (3) *Prereq.: consent of instructor. 3 hrs. lecture/seminar. Also offered as OCS 4126.* Controls on the mass balance and distribution of major elements, trace elements, heavy metals, dissolved gases, and nutrients in estuarine and open-ocean systems.

4083 Introduction to Isotope Geology (3) *Prereq.: GEOL 2081 and MATH 1550; or equivalent.* Principles of nuclear chemistry, radioactive decay, and isotopic fractionation processes; radiometric dating techniques and stable isotopic studies.

4084 Geomicrobiology (3) *Prereq.: GEOL 3032 or BIOL 2051 or consent of instructor. Also offered as BIOL 4084.* Microbial effects and controls on geologic, geochemical, and ecological processes; biochemical tracers and fossils of microbially mediated processes through time; introduction to biogeochemical processes.

4085 Geochemistry of Sediments and Natural Waters (3) *Prereq.: GEOL 2081 and MATH 1550.* Controls on the composition of natural waters and the role of fluid-rock interactions in the geochemical evolution of sedimentary rocks, the ocean, and the atmosphere; major geochemical cycles.

4111 Vertebrate Paleontology (3) *Prereq.: consent of instructor. 2 hrs. lecture; 2 hrs. lab.* Phylogenetic survey of fossil vertebrates; their origins and transitions; vertebrate taphonomy, biostratigraphy, and fossil collection and preparation.

4131 Basin Analysis (3) *Prereq.: GEOL 3032.* Basic environment of sediment deposition; sedimentological models and their relationships within depositional basins; analysis of theoretical basin models and comparison with modern and ancient sedimentary basins.

4164 Deltaic Geology (3) *Prereq.: consent of instructor. 2 hrs. lecture; 2 hrs. lab. Also offered as GEOG 4164.* Processes of deltaic sedimentation and the nature of deltaic sediments; Mississippi River delta compared to other modern and ancient deltas.

4165 Subsurface Geology (3) *Prereq.: GEOL 1001, 1003, 1601, 1602; PETE 4088 strongly recommended. 2 hrs. lecture; 3 hrs. lab.* Principles and methods of exploration, analysis, and interpretation using borehole data, electric logs, and samples of rocks and fluids; construction of geological maps and sections showing sediment facies, geological structure, geotemperature, fluid pressure and water salinity; analysis of fluid migration, oil and gas accumulation, and geothermal resources.

4182 Physical Hydrogeology (3) *Prereq.: GEOL 3032 and MATH 1552 or permission of instructor.* Subsurface fluid flow in geological materials; emphasis on geological controls of the origin and migration of pore water, including saline brines, in sedimentary basins; topics including crustal scale flow, petroleum migration, ore formation, and subsurface flow regimes in Louisiana.

4666 Coastal Field Geology (4) Su only *Prereq.: consent of instructor. Also offered as OCS 4666. Camp fee.* Four-week field course on the Louisiana coast utilizing facilities operated by Louisiana Universities Marine Consortium. Sedimentary environments, coastal processes, and environmental geological problems of the Mississippi delta plain.

6001 Topics in Earth Sciences for Teachers (3) Su *May be taken for a max. of 9 sem. hrs. when topics vary. Consent of instructor is required for the second and third times.* Various aspects of the earth sciences for elementary, middle, and high school teachers of science.

7031 Deep-water Depositional Environments (3) *Prereq.: introductory course in sedimentology, e.g., GEOL 3032.* Different types of sediment in deep water and on various transport processes; emphasis on submarine fan systems, their lithologic and seismic response; geological factors responsible for variation in end products.

7032 Fluvial Processes and Systems (3) *Prereq.: consent of instructor.* Fluid flow, sediment transport, and fluvial depositional processes; river systems as conveyor belts for sediment delivery to sedimentary basins; fluvial sediments in the stratigraphic record.

7043 Advanced Igneous Petrology (3) *Prereq.: GEOL 3041 or equivalent. 2 hrs. lecture; 3 hrs. lab.* Phase diagrams, magmatic origin of igneous rocks, and evolution of igneous provinces.

7044 Advanced Metamorphic Petrology (3) *Prereq.: GEOL 3041 or equivalent. 2 hrs. lecture; 3 hrs. lab.* Facies concept, theoretical and field relations, textures, and their significance.

7061 Sequence Stratigraphy (3) *Prereq.: introductory course in sedimentology, GEOL 3032 or equivalent. One week field trip to the southern Rocky Mountains is required.* Principles of physical stratigraphy with emphasis on contemporary concepts about the interaction of tectonics, sea level, and sediment supply in generating a predictable architecture of sedimentary basin fills.

7062 Seismic Stratigraphy (3) *Prereq.: GEOL 3071 or equivalent.* Interpretation of seismic reflection data in terms of sedimentary facies, stratigraphic sequences, and implications for local and eustatic sea-level fluctuations.

7064 Numerical Methods in the Geological Sciences (3)

Prereq.: CSC 2262, MATH 1552, and GEOL 4064; or equivalent. Numerical methods applied to geological research; interpolation and extrapolation, nonlinear equations, solutions of simultaneous linear equations, least squares approximations, numerical integration, numerical solution of differential equations, and Fourier transforms.

7065 Geodynamics (3) *Prereq.: MATH 2057 and 2090 or equivalent; and GEOL 4064 or equivalent.* Fundamental physical processes involved in plate tectonics and other geological phenomena; concepts in mantle convection, rock rheology, faulting, flexure, and heat transfer.

7081 Isotope Geochemistry (3) *Prereq.: consent of instructor. 2 hrs. lecture; 2 hrs. lab/demonstration.* Stable isotope fractionation in natural systems; emphasis on oxygen, hydrogen, and carbon isotope-ratio variation in natural waters, carbonates, and silicates with application to the solution of petrologic problems.

7083 Mass Spectrometry for Isotope Geology (3)

Prereq.: GEOL 4083 or consent of instructor. 2 hrs. lecture; 3 hrs. lab. Principles of thermal ionization mass spectrometry; chemical preparation of geological samples for isotope ratio measurements; use of multicollector solid source mass spectrometer; applications to geological studies.

7085 Paleooceanography (3) *Prereq.: GEOL 4081 or consent of instructor.* Physical conditions, circulation, bio-ecology, and chemistry of oceans in the past as inferred from sediment records; ocean's role in the climate system and its response to climatic and tectonic changes.

7111 Advanced Micropaleontology (3) *Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit.* Advanced training in micropaleontology.

7115 Paleocology (3) *Prereq.: GEOL 2061 and 3032. 2 hrs. lecture; 2 hrs. lab field trip.* Diversity, structure,

taphonomy, and evolution of fossil and modern marine assemblages; adaptations and functional morphology; organism-sediment relationships.

7117 Biostratigraphy (3) Prereq.: *GEOL 2061 or equivalent*. 2 hrs. lecture; 2 hrs. lab. Stratigraphic concepts; modern rules and procedures in interval and assemblage zonations; distribution of stratigraphically important fossil groups; event stratigraphy and chronostratigraphic modeling using computer techniques; applications to global and regional problems.

7120 Paleobiology (3) Prereq.: *GEOL 2061 or equivalent*. Petrology and petrography of terrigenous sandstones; applications of sediment mineralogy and texture to the fossil record; tempo and mode of evolution, hierarchy and macroevolution, mass extinctions, patterns of diversification; emphasis on development of theories and case studies.

7131 Petrology of Sandstones (3) 2 hrs. lecture; 3 hrs. lab. Petrology and petrography of terrigenous sandstones; applications of sediment mineralogy and texture to the analysis of provenance, deposition, and diagenesis; emphasis on the interrelationship of tectonics and sedimentation.

7132 Dynamics of Sedimentation (3) 2 hrs. lecture; 3 hrs. lab. Fluid mechanics as applied to sedimentation, fluid-particle interactions, erosion, mechanics of sediment transport including fluid and sediment flows, deposition and the origin of primary structures, and hydrodynamic instability and soft-sediment deformation.

7133 Sedimentary Petrography of Carbonates (3) 2 hrs. lecture; 3 hrs. lab. Principles governing formation, deposition, and diagenesis of carbonate sediments and sedimentary rocks; lab stresses textural, fabric, and mineral relationship and interpretation of depositional environments and mineral paragenesis of ancient carbonate sequences.

7134 Clay Mineralogy (3) 2 hrs. lecture; 3 hrs. lab/discussion. Mineralogy; geochemistry, and geology of clay minerals; argillaceous sediments and rocks.

7183 Physical Geochemistry of Burial Diagenesis (3) Prereq.: *GEOL 4085 or equivalent*. Quantitative techniques in thermodynamics, kinetics, and mass transport applied to problems of burial diagenesis of sedimentary minerals and fluids.

7195 Reservoir Characterization (3) Prereq.: *GEOL 4182 or PETE 4051 or consent of instructor*. 2 hrs. lecture; 2 hrs. lab. Also offered as *PETE 7195*. Origin, description, exploration, and development of oil and gas reservoirs; topics include accommodation space, reservoir occurrence, origin of petroleum, oil and gas properties, rock properties, drilling, exploration, and appraisal, reservoir flow modeling and production engineering; emphasis on integration of geology, geophysics, and petroleum engineering.

7200 Scientific Communication and Visualization (3) Methods for written, oral, and visual communication with an emphasis on scientific approaches, analysis and presentation of scientific quantitative information.

7900 Special Topics in Geology and Geophysics (3) V May be taken for a max. of 12 sem. hrs. of credit when topics vary. Advanced and/or emerging topics in geology and geophysics.

7909 Directed Research in Geology and Geophysics (1-6) May be taken for a max. of 10 sem. hrs. of credit when topics vary. General student-selected research topics and focused group research, including all topics in geology and geophysics.

7911 Seminar in Geology: Paleontology (2) May be repeated for credit.

7931 Seminar in Geology: Sedimentology (2) May be repeated for credit. Fall semester: carbonate sedimentology; spring semester: clastic sedimentology and sedimentary environments.

7941 Seminar in Geology: Igneous and Metamorphic Petrology (2) May be repeated for credit.

7961 Seminar in Geology: Structural Geology (2) May be repeated for credit.

7966 Field Work (1-9)

7971 Seminar in Tectonics (3) May be taken for a max. of 9 sem. hrs. of credit when topics vary. Plate tectonics, diapirism, isostasy, and the tectonics of specific areas.

7972 Seminar in Geophysics (3) May be taken for a max. of 9 sem. hrs. of credit when topics vary. Structure and composition of the mantle; physical processes at ridges, trenches, and transform faults; dynamics of plate interiors; intraplate stress; and thermal histories of the earth and other terrestrial planets; physics of rock magnetism; and hydrodynamics of sedimentary basins.

7981 Seminar in Geochemistry (2) Prereq.: *consent of instructor*. May be taken for a max. of 6 hrs. of credit. Mineralogy, paragenesis, geochemistry, and natural occurrence of authigenic silica in sediments; other topics such as hydro geochemistry, isotope geochemistry, and the geochemistry of carbonates.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

9000 Dissertation Research (1-12 per sem.) "S"/"U" grading.

GERMAN • GERM

Native speakers of German will not receive credit for courses marked with an asterisk ().*

General education courses are marked with stars (★).

***1101 Elementary German (4)** Basic lexicon and structures of German; emphasis on communicative language use; supplementary work in language and computer laboratories.

★*1102 Elementary German (4) Prereq.: *GERM 1101 or equivalent*. Continuation of *GERM 1101*. Basic lexicon and structures of German; emphasis on communicative language use. Supplementary work in language and computer laboratories.

2001 German for Travelers (3) German for travelers is not applicable towards a major or minor in German and does not fulfill foreign language requirements for undergraduates. The course introduces basic communication patterns, focuses on practical everyday vocabulary through exercises, role-playing, and situational activities.

★2075 German Civilization (3) Knowledge of German not required. Also offered as *HIST 2075*. Development of the modern German states from early Germanic times; art, literature, music, and philosophy in an historical context.

2090 Germanic Mythology (3) Knowledge of German not required. Germanic myths and legends; their major manifestations in religion, literature, art, and music.

★*2101 Intermediate German (3) Prereq.: *GERM 1102 or equivalent*. Reading, conversation, composition; review of lexicon and structure; supplementary work in language and computer laboratories.

★*2102 Intermediate German (3) Prereq.: *GERM 2101 or equivalent*. Continuation of *GERM 2101*. Reading, conversation, composition; emphasis on lexicon of spoken German; supplementary work in language and computer laboratories.

★*2155 Readings in German Literature (3) Prereq.: *GERM 2102 or equivalent*. Analysis of literary texts; expansion of lexicon, comprehension, and composition skills.

3060 German for Business (3) Prereq.: *GERM 2102 or equivalent*. Introduction to German in a business environment; focus on linguistic structures and vocabulary, forms of business communication, reading of business text, and social customs.

3061 German Discourse (3) Prereq.: *GERM 2102*. Intensive practice in listening comprehension, oral and written communication; special problems in German structure; thematic treatment of contemporary issues in German speaking countries.

3062 Advanced German Discourse (3) Prereq.: *GERM 3061*. Continued intensive practice in listening comprehension, oral and written communication; special problems in German structure; thematic treatment of contemporary issues in German speaking countries.

★3081 Survey of German Literature and Culture: Beginning to 1700 (3) Prereq.: *GERM 2155 or equivalent*. Readings from, and an historical overview of, the Middle Ages, the Renaissance, the Reformation, and the Baroque periods.

★3082 Survey of German Literature and Culture: 1700-1830 (3) Prereq.: *GERM 2155 or equivalent*. Readings from, and an overview of, the Enlightenment, Storm and Stress, Weimer Classicism, and Romanticism.

★3083 Survey of German Literature and Culture: 1830-1890 (3) Prereq.: *GERM 2155 or equivalent*. Readings from, and a historical overview of, Biedermeier/Vormarz, Realism, and Naturalism.

★3084 Survey of German Literature and Culture: 1890-to the Present (3) Prereq.: *GERM 2155 or equivalent*. Readings from, and a historical overview of, Expressionism, New Objectivity, the Group 47, GDR literature, and Post-Modernism.

3090 Friedrich Nietzsche (3) Knowledge of German not required. Also offered as *PHIL 3090*. Major works of Nietzsche studied in the context of the three periods of productivity and evolution of his thought.

3091 Special Topics in German Literature in Translation (3) Knowledge of German not required. May be taken for a max. of 6 hrs. of credit when topics vary.

4005 German for Reading Knowledge (5) S Specialized course intended to satisfy departmental foreign language reading requirement for graduate students. This course will not count toward a graduate degree. Undergraduates may enroll on a pass-fail basis only. Does not count toward satisfying foreign language requirements for undergraduates, although hours may count toward baccalaureate. Credit will not be given for both this course and introductory German courses.

4030 German Drama (3) Dramatic literature in German.

4031 German Poetry (3) Study of German poetic expression.

4032 German Prose (3) Emphasis on stylistic analyses and

narrative theories.

4041 Special Topics in Older Germanic Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4042 Special Topics in 18th Century German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4043 Special Topics in 19th Century German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4044 Special Topics in 20th Century German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4045 Special Topics in Contemporary German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4046 German Film (3) Knowledge of German not required. German film in its socio-historic contexts with some attention to cinematic technique.

4062 Advanced German Discourse (3) Prereq.: *GERM 3061 or equivalent*. Continued intensive practice in complex grammar and structures. Analysis and synthesis of authentic German material with focus on reading and writing.

4091 Special Topics in German Literature and Culture in Translation (3) May be taken for a max. of 6 hrs. of credit when topics vary. Knowledge of German not required.

4915 Independent Work (1-3) May be taken for a max. of 3 sem. hrs. credit. Permission of department required.

GREEK • GREK

General education courses are marked with stars (★).

1001 Elementary Greek (4) Credit will not be given for this course and *GREK 1002*. Introduction to the core vocabulary and grammar for reading and writing Ancient Greek; basic readings in Classical and Biblical Greek.

1002 HONORS: Elementary Greek (4) Same as *GREK 1001*, with special honors emphasis for qualified students. Credit will not be given for this course and *GREK 1001*. Homeric dialect, grammar, and meter, while reading basic passages from Homer's *Iliad*.

★2051 Intermediate Greek (4) Prereq.: *GREK 1001 or equivalent*. Credit will not be given for this course and *GREK 2052*. Completion of core vocabulary and grammar for reading and writing Ancient Greek; basic readings in Classical and Biblical Greek.

2052 HONORS: Intermediate Greek (4) Prereq.: *GREK 1002*. Same as *GREK 2051*, with special honors emphasis for qualified students. Credit will not be given for this course and *GREK 2051*. Continuation of Homeric dialect, grammar, and meter, while reading passages from Homer.

2103 Intermediate Greek Prose (3) Prereq.: *GREK 2051 or GREK 2052 or equivalent*. Application of grammar, vocabulary and concepts from the first year of Greek. Readings in basic ancient Greek prose.

★2153 Homer (3) Prereq.: *GREK 2103 or equivalent*. Readings from the *Iliad* or *Odyssey*; selected passages from various books; some attention to aesthetic and historical problems.

★2155 Greek Drama (3) Prereq.: *GREK 2103*. Readings in Greek drama including a representative play of Sophocles or Euripides.

★2156 New Testament (3) Prereq.: *GREK 2103 or equivalent*. Selected readings from the New Testament.

★2165 Plato's Dialogues (3) Prereq.: *GREK 2103 or equivalent*. Readings from Plato's dialogues.

★2166 Attic Oratory (3) Prereq.: *GREK 2103 or equivalent*. Readings from Attic orators such as Demosthenes, Andocides, Antiphon, Lysias.

4023 Special Topics in Greek Poetry (3) May be taken for a max. of 6 hrs. of credit. Readings and studies in one or more of the following: Homer, Hesiod, Pindar, Greek lyric poetry, Aeschylus, Sophocles, Euripides, Aristophanes.

4024 Special Topics in Greek Prose (3) May be taken for a max. of 6 hrs. of credit. Readings and studies in one or more of the following: Herodotus, Thucydides, the Pre-Socratics, the orators, Plato, Aristotle.

4915 Independent Work (1-3) May be taken for a max. of 6 sem. hrs. of credit. Permission of department required. Readings in Greek literature directed by a senior faculty member.

7003 Seminar in Greek Literature (3) May be taken for a max. of 15 hrs. of credit as topics vary.