GEOL Geology

GEOL 5090G Selected Topics
1-9 Credit Hours. 0-9 Lecture Hours. 0-9 Lab Hours.
This course provides a means by which new courses can be offered for experimental purposes. Graduate students will complete an individual term project or special report.
Prerequisite(s): Permission of instructor required.
Cross Listing(s): GEOL 5090, GEOL 5090S.

GEOL 5130G Geochemistry
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course covers the theory and applications of stable and radiogenic isotope geochemistry as applied to low-temperature geological processes. Graduate students will complete an individual term project or special report.
Cross Listing(s): GEOL 5130.

GEOL 5131G Economic Mineralogy
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
An introduction to the origins of industrial and metallic mineral resources, and the exploration, discovery and use of such resources. Laboratory work includes identification and evaluation of mineral resources and visits to mines. Graduate students must complete a paper on an assigned topic.
Prerequisite(s): GEOL 3541.
Cross Listing(s): GEOL 5131.

GEOL 5130G Regional Field Geology
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
A field expedition involving geological investigation of a major geologic region of North America. Students will be expected to make geological observations through such techniques as mapping, measuring sections, collecting scientific samples, or other standard techniques, then to analyze and interpret their observations or measurements. A scientific journal or notebook will be used by each student to record data and observations. A final report will be required. Students usually will bear tuition, travel, and living expenses in the field. Graduate students will complete an individual term project or special report.
Prerequisite(s): GEOL 1121.
Cross Listing(s): GEOL 5132.

GEOL 5140G Vertebrate Paleontology
4 Credit Hours. 4 Lecture Hours. 0 Lab Hours.
A study of the morphology, classification and geologic significance of vertebrate fossils. Graduate students will complete an individual term project or special report.
Prerequisite(s): GEOL 1122 or permission of instructor; GEOL 5141 strongly recommended.
Cross Listing(s): GEOL 5140.

GEOL 5141G Paleontology
0-4 Credit Hours. 0-3 Lecture Hours. 3 Lab Hours.
This course provides an overview of the major principles, applications, and methods of paleontology. Topics covered in this course include, but are not limited to: the formation of fossils, fossil identification and classification, evolution and extinction, biostratigraphy, biogeography, paleoecology, and functional morphology. Labs utilize a diverse collection of invertebrate fossils and paleontology software. Graduate students will complete a special report, not required of undergraduates.
Prerequisite(s): GEOL 1122.
Cross Listing(s): GEOL 5141.

GEOL 5142G Stratigraphy and Sedimentation
4 Credit Hours. 4 Lecture Hours. 0 Lab Hours.
Introduction to the principles and application of stratigraphy and biostratigraphy, and principles of sedimentation. Emphasis is placed on concepts of time, time-rock, rock units, sedimentary facies, guide fossils and fossil range and description of rocks in time and space, their correlation and interpretation. Petrologic interpretation and basic laboratory techniques are also demonstrated. The origin and distribution of sedimentary rocks is examined from initial weathering through erosion and transportation, to environments and mechanisms of deposition. Graduate students will complete an individual term project or special report.
Prerequisite(s): GEOL 3541.
Cross Listing(s): GEOL 5142.

GEOL 5230G Earth Science
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
A systematic study of the earth as a planet, including aspects of its atmosphere, oceans, lithosphere, soils and physiography. The laboratory will emphasize the location and utilization of local, as well as regional materials for earth science teaching and learning. Graduate students will complete an individual term project or special report. This course cannot be used for upper-level course credit in the Geology BA, Geology BS, or Geology Minor programs.
Prerequisite(s): Permission of instructor required.
Cross Listing(s): GEOL 5230.

GEOL 5231G General Oceanography
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course is an integrated approach to the study of oceans with special emphasis on geology, chemistry, and biology of ocean basins. Studies will include the ecological, physical, and geological features of ocean basins, as well as chemical composition of ocean water and oceanic circulation processes. This course cannot be used for upper-level course credit in the Geology BA, Geology BS, or Geology Minor programs.
Prerequisite(s): GEOL 1110 or GEOL 1121 or GEOL 1121S or GEOL 5230 or GEOL 5230G.
Cross Listing(s): GEOL 5231.

GEOL 5340G Barrier Island Environmental Geology
4 Credit Hours. 2 Lecture Hours. 6 Lab Hours.
This course is an on site, direct observation study of the physical processes that create barrier islands and drive their geologic and environmental evolution. The course will cover principles of coastal geology and barrier island hydrogeology. Students will observe and document the diverse environments of a Georgia barrier island and the effects of coastal erosion and sea level rise on island environments and wildlife habitat. Students will also explore the anthropogenic impacts to these environments and resources, practice field science observation and documentation skills, and develop research and presentation skills through team research projects during an eight to ten day residence on St. Catherines Island. Graduate students can expect more comprehensive and rigorous assessments as well as additional work based on the graduate field of study.
Prerequisite(s): Permission of instructor.
Cross Listing(s): GEOL 5340.

GEOL 5431G Coastal Geology
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Coastal Geology will comprise an introduction to a variety of coastal environments and landforms as well as the physical and geological processes that shape them. Coastal hazards and issues related to the ecology and management of the coast will also be discussed. The course will include two required weekend fieldtrips to coastal areas in the southeastern United States. Graduate students will complete an individual term project or a special report.
Prerequisite(s): GEOL 1122 or permission of instructor; GEOL 5142 strongly recommended.
Cross Listing(s): GEOL 5431.
GEOL 5440G  Structural Geology  
4 Credit Hours.  4 Lecture Hours.  0 Lab Hours.  
A study of geologic structures resulting from rock formation and deformation. Attention will be given to recognition and solution of structural problems. Graduate students will complete an individual term project or special report.  
Prerequisite(s): GEOL 3542 and MATH 1112 or MATH 1113.  
Cross Listing(s): GEOL 5440.  

GEOL 5530G  Geomorphology  
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.  
A systematic study of landforms and the processes which create and modify them. Graduate students will complete an individual term project or special report.  
Prerequisite(s): GEOL 1122 or GEOG 1111.  
Cross Listing(s): GEOL 5530.  

GEOL 5541G  Hydrogeology  
4 Credit Hours.  4 Lecture Hours.  0 Lab Hours.  
A survey of hydrogeology that includes the occurrence, distribution, movement and chemistry of subsurface waters. Emphasizes subsurface hydrology (hydrogeology), but will also include related aspects of surface systems. Major topics covered will include: 1) relationships between precipitation, runoff, and infiltration; 2) porosity and permeability of various earth materials; 3) subsurface movement of water through earth materials; 4) basic chemical characteristics of natural waters; and 5) current water resource issues such as supply, quality, contamination, and remediation. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.  
Prerequisite(s): GEOL 3542.  
Cross Listing(s): GEOL 5541.  

GEOL 5542G  Advanced Hydrogeology  
4 Credit Hours.  3 Lecture Hours.  2 Lab Hours.  
In-depth study of hydrogeologic and geochemical principles with emphasis on quantitative techniques. Various laboratory and field techniques will be covered, including the use of numerical models and aquifer testing. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.  
Prerequisite(s): GEOL 5541.  
Cross Listing(s): GEOL 5542.  

GEOL 5740G  Sea Turtle Natural History  
4 Credit Hours.  2 Lecture Hours.  6 Lab Hours.  
A field-based course in which students work as sea turtle conservation scientists by monitoring beaches and documenting and recording nesting activity during an 8 to 10 day residence on St. Catherines Island, Georgia. Students will prepare for field work with two days of lectures on the GSU campus as well as a training session on GA DNR nest monitoring protocols, prior to field work on St. Catherines Island. Students will keep a daily field journal and prepare a paper on loggerhead sea turtles, documenting nesting behavior, nesting habitat, hatching emergences and threats to hatchlings and adults using images acquired during their daily monitoring activity. Graduate students can expect more comprehensive and rigorous assessments as well as additional work based on the graduate field of study. Graduate students will also complete a resource notebook or term project.  
Prerequisite(s): Permission of instructor.  
Cross Listing(s): GEOL 5740.  

GEOL 5741G  Sea Turtle Conservation  
4 Credit Hours.  3 Lecture Hours.  8 Lab Hours.  
Designed primarily for pre-service and in-service teachers, will introduce students to conservation through the study of Georgia’s sea turtles, content and process skills of science through conservation, and the integration of teaching resources and electronic technologies into their classrooms. May meet by distance learning with laboratory content delivered by Internet, distance learning, fax, or e-mail or by self-contained web-based video streaming (SREC). Will average 3 hours of lecture alternate weeks via distance leaning and 4-8 credit hours of laboratory on alternate weekends via Internet, e-mail, and hands-on exercises. Permission of instructor required. Graduate students will complete an endangered species teaching unit or paper.  
Cross Listing(s): GEOL 5741.  

GEOL 5890G  Directed Study  
1-3 Credit Hours.  1-3 Lecture Hours.  0 Lab Hours.  
Well prepared geology majors may be permitted to carry on independent study upon the recommendation of one of the geology/geography faculty. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.  
Prerequisite(s): Permission of instructor required.  
Cross Listing(s): GEOL 5890.  

GEOL 6097  Special Topics Geol Res & Envi  
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.  
Detailed presentation of a selected topic in geological sciences. May be repeated for credit for a maximum of 6 credit hours, if topic is different.