GEOL Geology

GEOL 1011K Introductory Geosciences I
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
This course covers Earth materials and processes.

GEOL 1110 Earth Laboratory
1 Credit Hour. 0 Lecture Hours. 2 Lab Hours.
A series of laboratory components that involve hands-on exercises with earth materials and processes which modify the Earth's interior and exterior. Concurrent or prior completion of GEOL 1121. Strongly recommended to be taken concurrently with GEOL 1121. Corequisite(s): GEOL 1121.

GEOL 1121 Introduction to the Earth
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
An introductory study of the origin and structure of earth materials and the processes which modify Earth's interior and exterior. The laboratory component of this course offers hands-on exercises related to Earth materials, interpretation of topographic and geologic maps, principles of geologic time, and plate tectonic processes. Cross Listing(s): GEOL 1121H, GEOL 1121S.

GEOL 1121H Introduction to the Earth
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
An introductory study of the origin and structure of earth materials and the processes which modify Earth's interior and exterior. The laboratory component of this course offers hands-on exercises related to Earth materials, interpretation of topographic and geologic maps, principles of geologic time, and plate tectonic processes. Cross Listing(s): GEOL 1121 and GEOL 1121S.

GEOL 1121S Introduction to the Earth
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
An introductory study of the origin and structure of earth materials and the processes which modify Earth's interior and exterior. The laboratory component of this course offers hands-on exercises related to Earth materials, interpretation of topographic and geologic maps, principles of geologic time, and plate tectonic processes. Cross Listing(s): GEOL 1121 and GEOL 1121S.

GEOL 1122 General Historical Geology
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Discusses the origin and geological history of Earth. Methods of interpretation, fossils, geologic time measurements, time scales, physical and organic development of Earth are taught. Prerequisite(s): GEOL 1121 may be taken concurrently with permission of instructor.

GEOL 1310 Environmental Geology Lab
1 Credit Hour. 0 Lecture Hours. 2 Lab Hours.
A series of laboratory components that involve hands-on exercises with earth materials and processes which modify the Earth's interior and exterior. Prerequisite(s): Concurrent or prior completion of GEOL 1121; strongly recommended to be taken concurrently with GEOL 1121. Cross Listing(s): GEOL 1310.

GEOL 1310H Environ Geol Lab (Honors)
1 Credit Hour. 1 Lecture Hour. 0 Lab Hours.
A series of laboratory components that involve hands-on exercises with earth materials and processes which modify the Earth's interior and exterior. Prerequisite(s): Concurrent or prior completion of GEOL 1121; strongly recommended to be taken concurrently with GEOL 1121. Cross Listing(s): GEOL 1310.

GEOL 1340 Environmental Geology
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
An introduction to using geologic principles and knowledge to address problems arising from the interaction between humans and the geologic environment. One major component of the course examines geologic hazards, including flooding, earthquakes, volcanic eruptions, and coastal erosion. The other component explores important geologic resources, including water, soils, mineral, and energy, and the way modern society depends on these resources. The laboratory portion of the course consists of hands-on data collection, analysis, and problem solving of geologic and environmental problems related to natural hazards and society's use of Earth resources. Cross Listing(s): GEOL 1310, GEOL 1310H.

GEOL 1340H Environmental Geology (Honors)
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
An introduction to using geologic principles and knowledge to address problems arising from the interaction between humans and the geologic environment. One major component of the course examines geologic hazards, including flooding, earthquakes, volcanic eruptions, and coastal erosion. The other component explores important geologic resources, including water, soils, mineral, and energy, and the way modern society depends on these resources. The laboratory portion of the course consists of hands-on data collection, analysis, and problem solving of geologic and environmental problems related to natural hazards and society's use of Earth resources.

GEOL 1430 Dinosaurs, Extinctions and Disasters
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
A review of the dynamic processes of extinction, evolution, and change in ancient animal assemblages. Particular attention will be paid to the unique terrestrial communities that were dominated by dinosaurs, mammoths, and other megafauna. We will focus on the effects of meteorite collisions, ice ages, and mass extinction events.

GEOL 1530 Principles of Oceanography
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course is a survey course dealing with the physical, geological, and ecological features of ocean basins and coastlines, as well as chemical composition of ocean water and oceanic circulation processes.

GEOL 3520 Field Methods
2 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
Instruction in the tools and techniques used in the collection of field data, compilation of geologic maps and crossed sections. Students will construct topographic and geologic maps and write geologic reports and abstracts. The course will consist of three main areas: data sources, data collection, and post-processing. Two weekend field trips are required. Prerequisite(s): GEOL 1122 and MATH 1112 or MATH 1113; two-day field trips are required.

GEOL 3541 Petrology and Petrography
0-4 Credit Hours. 0-3 Lecture Hours. 0-3 Lab Hours.
An introductory study of the origin, occurrence, and classification of common igneous and metamorphic rocks. Laboratory work consists of study of common crystal forms, hand specimen identification and optical study via the petrographic microscope. Prerequisite(s): GEOL 1110 or GEOL 1121, and CHEM 1145.

GEOL 3542 Petrology and Petrography
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
An introduction to using morphological crystallography, physical properties and the optical characteristics of the common minerals. Examines the genesis, occurrence, and uses of minerals. Laboratory work consists of study of common crystal forms, hand specimen identification and optical study via the petrographic microscope. Prerequisite(s): GEOL 1110 or GEOL 1121, and CHEM 1145.
GEOL 3741 Remote Sensing
4 Credit Hours. 2 Lecture Hours. 4 Lab Hours.
Introduction to the concepts, theory, collection, analysis and applications of remotely sensed spatial information.
Prerequisite(s): Permission of instructor required.
Cross Listing(s): GEOG 3741.

GEOL 3790 Teaching Internship in Geology
1-3 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
Student interns in Introduction to the Earth (GEOL 1121), General Historical Geology (GEOL 1122), or Environmental Geology (GEOL 1340) will participate in teaching the course under the mentorship of a faculty member. Student interns will attend an introductory workshop immediately prior to the start of the semester, will intern in one of the above courses, and meet with the faculty mentor one hour each week. One credit hour is awarded per laboratory section in which the student interns.
Prerequisite(s): A minimum grade of "B" in GEOL 1121 or GEOL 1122 or GEOL 1340.

GEOL 4120 Introduction to Research
2 Credit Hours. 2 Lecture Hours. 0 Lab Hours.
The process of research will be studied from the scientific method through the process of writing a scientific proposal. Construction of a technical paper and the technical oral presentation will be examined and practiced. Usages of geologic terms will be explained and learned. A proposal for a research paper will be selected or assigned, a proposal written and an oral presentation of the proposal research will be prepared. A minimum grade of "B" is required to continue in the research sequence.
Prerequisite(s): Permission of instructor required.

GEOL 4530 Tectonics
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Processes, structures, and land forms associated with the deformation of the earth's crust are studied including the changes that take place on structures and landforms over time. Scales ranging from local, to regional, to global are incorporated.
Prerequisite(s): GEOL 1121 or GEOL 1110.

GEOL 4610 Senior Seminar
1 Credit Hour. 1 Lecture Hour. 0 Lab Hours.
The process of scientific communication will be investigated and practiced. A final paper on the student's senior research topic will be written and an oral presentation in a formal "Technical Session" format. The student will learn to prepare visual aids to illustrate his/her paper and talk. The "Technical Session" will be organized and run by students.
Prerequisite(s): GEOL 4830.

GEOL 4790 Internship in Geology
1-6 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
The internship allows students to work in a professional setting related to their chosen concentration in the field. Undergraduate students can earn between one and six credits for internships approved by their academic advisor and the Department's Internship Director. Students must maintain contact with the Internship Director through the course of the internship work, and must submit a written report and a work product at the end of the project. Internship credits can be used for elective credit only and may not substitute for specific degree requirements.
Prerequisite(s): Permission of Geology and Geography Internship Director is required.

GEOL 4830 Senior Thesis Research I
3 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
Students will complete a literature review and evaluation and conduct independent research as outlined in their research proposal formulated during Introduction to Research (GEOL 4120). Research is conducted under the direction of a faculty advisor and will lead to the completion of the senior thesis.
Prerequisite(s): A minimum grade of "B" in GEOL 4120 and minimum GPA of 3.0.

GEOL 4831 Senior Thesis Research II
3 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
The process of scientific communication will be investigated and practiced through completion of a senior thesis project. This project includes both a written thesis and research presentation. Students will format a thesis manuscript suitable for publication in a professional journal, and design and deliver an oral presentation suitable for a professional conference.
Prerequisite(s): A minimum grade of "B" in GEOL 4830.

GEOL 5090 Selected Topics
1-9 Credit Hours. 1-9 Lecture Hours. 3-9 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 5090S, GEOL 5090G.

GEOL 5090S Selected Topics
1-9 Credit Hours. 1-9 Lecture Hours. 3-9 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 5090S, GEOL 5090G.

GEOL 5130 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.
Prerequisite(s): CHEM 1146 and GEOL 3541.
Cross Listing(s): GEOL 5130G.

GEOL 5131 Economic Mineralogy
3 Credit Hours. 2 Lecture Hours. 3 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 5131G.

GEOL 5132 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 5132G.

GEOL 5140 Vertebrate Paleontology
4 Credit Hours. 3 Lecture Hours. 2 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 5140G.
GEOL 5141 Paleontology
0.4 Credit Hours. 0.4 Lecture Hours. 3 Lab Hours.
This course provides an overview of the major principles, applications, and methods of paleontology. Topics covered in the 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 5141G.

GEOL 5142 Stratigraphy and Sedimentation
4 Credit Hours. 3 Lecture Hours. 2 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 age 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 5142G.

GEOL 5230 Earth Science
3 Credit Hours. 2 Lecture Hours. 3 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 5230G.

GEOL 5231 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 1121 or GEOL 5230.
Cross Listing(s): GEOL 5231G.

GEOL 5431 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; prior completion of GEOL 5142 strongly recommended.
Cross Listing(s): GEOL 5431G.

GEOL 5440 Structural Geology
0.4 Credit Hours. 0.4 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 5440G.

GEOL 5530 Geomorphology
0.3 Credit Hours. 0.2 Lecture Hours. 0.3 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 5530G.

GEOL 5541 Hydrogeology
4 Credit Hours. 3 Lecture Hours. 2 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 5541G.

GEOL 5542 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 5542G.

GEOL 5740 Sea Turtle Natural History
4 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
Designed primarily for in-service teachers, will allow students to earn 4 hours credit for research monitoring sea turtle nesting on St. Catherine's Island, Ga. Students will attend two distance learning training sessions, reside on the island for seven days to observe sea turtle nesting evidence, participate in sea turtle conservation activities, study barrier island natural history with lectures by leading scientists, and collect natural history specimens for their classrooms, and attend a follow-up meeting. Graduate students will complete a resource notebook or term project.
Cross Listing(s): GEOL 5740G.

GEOL 5741 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 learning 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 5741G.

GEOL 5890 Directed Study
1-4 Credit Hours. 0-3 Lecture Hours. 0-3 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 5890G.