

# Geology (GEOL)

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## **GEOL 5010. Environmental Geology. 3 Hours.**

The application of basic geologic principles and techniques to problems in land-use planning, resource management, waste disposal, conservation, energy plant sitings, under-and -above-ground construction, subsidence, construction in seismic areas, slope-stability, urban development and other problems resulting from human interaction with the geological habitat.

## **GEOL 5020. Geoscience Perspectives on Global Climate Change. 1 Hour.**

Prerequisite: GEOG/GEOL 1110 or GEOG 1113K or GEOL 1112K. Study of global climate change from the perspective of the geoscientist. Topics include whether or not global climate change is occurring, possible causes of global climate change, climate change in the geologic record, implications of climate change on the human population, and proposed methods and policies designed to limit or reverse processes believed to lead to global climate change.

## **GEOL 5050. Oceanography. 3 Hours.**

The physical, chemical, geological, and biological characteristics of the ocean and the interactions between the hydrosphere, lithosphere, atmosphere, and biosphere.

## **GEOL 5100. Principles of Mineralogy/Petrology. 3 Hours.**

An introduction to mineral and rock identifications, and the study of the genesis, occurrence, and uses of common minerals and rocks. Laboratory consists of identification of common rocks and minerals.

## **GEOL 5101. Mineralogy. 4 Hours.**

The classification, identification, and crystallography of the principal rock-forming minerals, silicate and non- silicate; and the introduction of the use of the petrographic microscope in the study of the crystallography and identification of minerals.

## **GEOL 5102. Petrology and Petrography. 4 Hours.**

Genesis classification, and properties of igneous, metamorphic, and sedimentary rocks. Laboratory includes the use of analytical methods, hand specimens, and thin-section study with the petrographic microscope, and the megascopic and microscopic properties of important rock types.

## **GEOL 5120. Geosciences Field Trip. 3 Hours.**

Prerequisites: GEOG 1113K or GEOL 1121K. Geology and geography of selected regions studied by readings on the region of interest during the first week followed by a two week field trip to points of interest. The interactions between geology, surficial processes, and organisms and how those interactions impact humans will be emphasized. Field trip destination is different each summer. Student fee required. Offered only during Summer I session.

## **GEOL 5200. History of Life. 3 Hours.**

Principles of paleontology with emphasis on the history of life including vertebrates. Includes an account of the outstanding forms of life from the beginning of earthtime to the present, and those paleontologically significant groups that are uncommon, different, or extinct today.

## **GEOL 5210. Introduction to Hydrology. 4 Hours.**

An introduction to surface and sub-surface hydrology, examining components of the hydrologic cycle. Topics include local and global water balance, precipitation, interception and infiltration, runoff, stream flow, water storage, and groundwater. This course makes use of some mathematical equations.

## **GEOL 5220. Invertebrate Paleontology. 3 Hours.**

Identification, classification, and natural history of major groups of invertebrates preserved as fossils in the geologic record, with special attention to those forms commonly encountered in the southeastern United States. Emphasis in laboratory will include taxonomic affinities and functional morphology. Saturday (optional) field trips will be scheduled to local areas of interest.

## **GEOL 5230. Vertebrate Paleontology. 3 Hours.**

Geologic history and evolution of animals with backbones, with coverage of extinct groups such as the Dinosauria.

## **GEOL 5250. Micropaleontology. 3 Hours.**

The classification, stratigraphic relationships, and methods of study of microfossils with emphasis on the stratigraphically important groups.

## **GEOL 5300. Introduction to Process Geomorphology. 4 Hours.**

An introduction to process geomorphology examining landforms and their formative processes. Topics include weathering and slope, fluvial, coastal, eolian, glacial, periglacial processes and the application of soils to geomorphology. This course makes use of some mathematical equations. Field trip required.

## **GEOL 5400. Planetary Geology. 3 Hours.**

Also offered as ASTR 5400. Pre-requisite: ASTR 1010 or GEOL 1121K or GEOG 1113K. Pre-requisite or Co-requisite: PHSC 1100 or PHYS 1111k or PHYS 2211K. A study of the terrestrial planets and solid-surface moons, asteroids, comets and meteorites. The course will focus on comparative planetary geology, with emphasis on geologic processes on the surface (e.g. volcanism, impact cratering, tectonism, erosion, mass wasting, mineralogy and petrology), planetary interiors, and data collection methods such as remote sensing and image analysis.

## **GEOL 5410. Structural Geology. 3 Hours.**

The discussion of structural features of the rocks such as folds, faults, joints, cleavage, and primary structures, including their origin, classification, analyses and economic relationships. A study of tectonic plate motion is included. Laboratory work includes depth and thickness problems, structure sections, and structure contour maps.

**GEOL 5450. Field Methods in Geology. 4 Hours.**

An introduction to the basic tools and techniques used in preparation of topographic and geologic maps, and profiles and cross-sections. Includes uses of level table, alidade, Brunton compass, and aerial photographs.

**GEOL 5500. Principles of Geochemistry. 4 Hours.**

Chemical principles applied to the study of geological and environmental processes. Topics covered include radiogenic and stable isotopes, thermodynamics, aqueous solutions, oxidation-reduction reactions, and mineral-water equilibria. Application of these concepts to weathering processes, water chemistry, geothermometry, radiometric dating, and other geologic topics. Two lectures and one laboratory per week.

**GEOL 5710. Environmental Soil Science. 4 Hours.**

Prerequisites: GEOG/GEOL 3300, CHEM 1211K. Soils properties, distribution, and classification, factors of soil formation, and the relationships between soils, geomorphology, and the environment, stressing analysis and use of soils and soil databases for proper urban, agricultural, and environmental land use.

**GEOL 6110. Principles of Stratigraphy. 3 Hours.**

The interrelationships of stratigraphy, sedimentation, and paleogeography; methods in stratigraphy and correlation.

**GEOL 6900. Special Topics in Geology. 1-6 Hours.**

Topics to be assigned by instructor; may be taken more than once if topics are different; up to a total of 6 credit hours.

**GEOL 6950. Directed Studies in Geology. 1-6 Hours.**

Study of subjects not normally found in established courses offered by this department; may also allow students to explore in more detail and/or depth subjects covered by this department, up to a maximum of 6 credit hours.