GEOLOGY

FACULTY:
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The Department of Geology at The College of Wooster produces liberally educated scientists who are well-versed in scientific methodology and its application, who possess a thorough knowledge of fundamental geologic concepts, who take a creative approach to problem-solving, and who are able to express themselves with clarity, both orally and in writing.

Geology is an interdisciplinary science. Geologists employ principles of physics, chemistry, and biology to understand Earth history and Earth processes. Geologists should be broadly educated in the natural sciences and have diverse field and laboratory experience with rocks and fossils, which is the primary goal of the Geology major at Wooster.

Major in Geology:

Consists of twelve courses:

- One 100-level Geology course
- CHEM 11100
- GEOL 20000
- GEOL 20800
- GEOL 25000
- GEOL 26000
- GEOL 30000
- GEOL 30800
- GEOL 31300
- Junior Independent Study: GEOL 40100
- Senior Independent Study: GEOL 45100
- Senior Independent Study: GEOL 45200

Minor in Geology:

Consists of six courses:

- GEOL 20000
- Five elective Geology courses, with no more than two courses at the 100-level (BIOL 36000 may count as one of these electives)

Special Notes

- The laboratory and classroom components are closely integrated in Geology lab courses and must therefore be taken concurrently. The course and laboratory grades will be identical and are based on performance in both components; the relative weights of the two components are stated in each course syllabus.
- Geology majors who intend to make a career in geology are strongly urged to supplement their curriculum with at least one additional course in chemistry, two courses in physics, and two courses in calculus (or a combination of calculus and computer science). Other relevant courses will depend upon the student's particular interest in Geology.
- S/NC courses are not permitted in the major department and in CHEM 11100.
- Only grades of C- or better are accepted for the major or minor.

- Prerequisite for 200-level courses requires a grade of C- or higher in any 100-level Geology course. This does not apply to GEOL 22000, which does not have a prerequisite.

GEOLOGY COURSES

GEOL 10000. HISTORY OF LIFE (Archaeology)
Origin and evolution of life, with emphasis on biologic innovations and crises in the context of Earth history. Three hours of lecture weekly. *Annually. [MNS]*

GEOL 10300. OCEANOGRAPHY
Rocks, sediments, geophysics, structure, and history of ocean basins and their margins. An interdisciplinary examination of the oceans with emphasis on physical oceanography. Three hours of lecture weekly. *[MNS]*

GEOL 10500. GEOLOGY OF NATURAL HAZARDS (Archaeology, Environmental Studies)
Survey of the geologic conditions, human and environmental impacts, and regulatory consequences of natural hazards and disasters. Course focus is on earthquakes, volcanoes, flooding, landslides, and destructive coastal processes. Three hours of lecture weekly. *Annually. [MNS]*

GEOL 11000. ENVIRONMENTAL GEOLOGY (Environmental Studies)
An investigation of how human activities affect and are affected by physical Earth processes. Topics include an overview of Earth's development; minerals and rocks; internal processes such as plate tectonics, earthquakes, and volcanoes; surface processes; natural resources; waste disposal; pollution and related topics. Three hours of lecture weekly. Fieldtrips. *Annually. [MNS]*

GEOL 19901. GEOLOGY OF OUR NATIONAL PARKS (Archaeology, Environmental Studies)
Examination of the fundamental geologic processes responsible for the unique landscapes of the U.S. National Parks. Topics include plate tectonics; geologic time; Earth materials; mountain building; volcanism; climate change; and surficial and subsurface landscape evolution through glacial, stream, and groundwater activity. An overview of the geologic histories of selected National Parks will be emphasized. Three hours of lecture weekly. *[MNS]*

GEOL 20000. PROCESSES AND CONCEPTS OF GEOLOGY (Archaeology)
Materials, structures and surface features of the Earth; geological processes and their effects through time; origin and evolution of Earth. Three hours of lecture and three hours of laboratory weekly. One-day fieldtrips. *(1.25 course credits) Prerequisite: any 100-level Geology course. Annually. [MNS]*

GEOL 20800. MINERALOGY (Archaeology)
Introduction to crystallography; detailed study of mineral structure and occurrence. Three hours of lecture and three hours of laboratory weekly. *(1.25 course credits) Prerequisite: any 100-level Geology course and CHEM 11100 (which can be taken concurrently). Annually. [MNS]*

GEOL 21000. CLIMATE CHANGE (Archaeology, Environmental Studies)
Analyses of the Earth's ocean-atmosphere system and energy balance, Quaternary dating methods and techniques of reconstructing past climates are outlined. Students will work with paleoclimate data sets from ocean cores, ice cores, tree-rings, lake cores, and corals. Labs include computer modeling, statistical analysis of time series, and various projects. Three hours of lecture and three hours of laboratory weekly. Fieldtrips required. *(1.25 course credits) Prerequisite: any 100-level Geology course. Annually. [Q]*

GEOL 22000. INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (GIS) (Archaeology, Environmental Studies)
A lab-intensive introduction to the basic concepts in computer-based GIS. The course is designed to provide interested students a hands-on approach to spatial database design and analysis. Students will depict and evaluate spatial data to produce cartographic results in order to solve problems in a variety of disciplines, with emphasis on the natural sciences. The primary platform used will be ArcMap by ESRI and Microsoft Excel, but the techniques learned are applicable to other software packages. Three hours of lecture weekly. *Alternate years. [MNS]*

GEOL 25000. INVERTEBRATE PALEONTOLOGY
Identification, systematics, evolution, and paleoecologic analysis of invertebrate fossil groups. Three hours of lecture and three hours of laboratory weekly. Fieldtrips required. *(1.25 course credits) Prerequisite: Any 100-level Geology course or BIOL 20200. Annually. [W, MNS]*

GEOL 26000. SEDIMENTOLOGY AND STRATIGRAPHY (Archaeology)
Physical and biological methods for the analysis of sedimentary environments and processes. Investigating the distribution of sedimentary rock units in space and time. Three hours of lecture and three hours of laboratory weekly. Fieldtrips. *(1.25 course credits) Prerequisite: Any 100-level Geology course. Annually. [W, MNS]*

GEOL 29900. TECTONICS AND BASIN ANALYSIS
Examination of the processes responsible for the formation and evolution of tectono-sedimentary basins in order to understand the interplay of tectonic, climatic, and eustatic controls on subsidence mechanisms and sediment accumulation history. Selected tectonic settings and diverse basin types from different geologic time periods will be emphasized. Various petrographic, sedimentologic, stratigraphic, structural, and geophysical data sets will be used in order to model and to analyze basin histories. Three hours of lecture weekly. *Prerequisite: GEOL 26000, GEOL 30800, or permission of instructor..*

GEOL 29901. HYDROLOGY
Introduction to the study of the origin and occurrence of groundwater and of those principles of fluid flow in porous media which govern the flow of groundwater. The hydraulic properties of groundwater systems and water wells, the relationships between groundwater and other geological processes, the development of groundwater resources, water quality, recharge of groundwater, and solute transport and contamination are emphasized. *Prerequisite: Any 100-level Geology course. Annually.*

GEOL 30000. GEOMORPHOLOGY AND HYDROGEOLOGY (Archaeology)
A study of the classification, genesis, and evolution of the diverse landforms which make up the surface configuration of the Earth. Relationship of soils, surficial materials and landforms to rocks, structures, climate, processes, and time. The hydrologic cycle and surface water processes, geologic settings of groundwater, groundwater flow to wells, and water quality. Three hours of lecture and three hours of laboratory weekly. Fieldtrips required. *(1.25 course credits) Prerequisite: GEOL 20000 or permission of instructor. Annually.*

GEOL 30800. IGNEOUS AND METAMORPHIC PETROLOGY (Archaeology)
Introduction to petrography and petrology of igneous and metamorphic rocks. Integration of theoretical petrology, geochemistry, and petrography into an understanding of the petrogenesis of rock systems. Three hours of lecture and three hours of laboratory weekly. *(1.25 course credits) Prerequisite: GEOL 20800. Annually.*

GEOL 31300. STRUCTURAL GEOLOGY
Introduction to the processes of deformation and geometry of deformed rocks. Examination of rock deformation through analysis of structures at both microscopic and outcrop scales with emphasis on descriptive geometry, map interpretation, and cross-section construction methods. Three hours of lecture and three hours of laboratory weekly. Fieldtrips required. *(1.25 course credits) Prerequisite: GEOL 20000. Annually. [Q]*

GEOL 35000. STUDIES IN GEOLOGY
To allow students with significant geological background to explore interdisciplinary topics in further detail. Planetary Geology, Geochemistry, Geophysics, Desert Geology, Geology of Oil and Gas and others offered when sufficient student interest is shown. *Prerequisite: GEOL 20000 and others, depending on topic offered. [W]*

GEOL 40000. TUTORIAL
Advanced library, field, and laboratory research problems in geology. *(.5 – 1 course credit) Prerequisite: The approval of both the supervising faculty member and the chairperson is required prior to registration.*

GEOL 40100. JUNIOR INDEPENDENT STUDY
Concepts and techniques of geologic research culminating in a Junior I.S. thesis project. *Prerequisite: GEOL 20000. Annually. Fall or Spring.*

GEOL 410000. INTERNSHIP
A structured, usually off-campus experience, in which a student extends classroom knowledge to a work position within a community, business, or governmental organization. Student interns work and learn under the joint guidance of a host organization supervisor and a College of Wooster mentor. The student must arrange the internship in advance through the appropriate department or program. No more than six internships, and a maximum of four Wooster course credits, will count toward graduation. The form for registering for an internship and the Internship Learning Plan are available in the office of the Registrar. *(0.25-4 course credits) S/NC course. Prerequisite: The approval of a College of Wooster mentor, department chair, the faculty adviser, and the Associate Dean for Experiential Learning is required. Annually.*

GEOL 45100. INDEPENDENT STUDY THESIS – SEMESTER ONE
An original geological investigation is required. An oral presentation is given to the department. *Prerequisite: GEOL 40100.*

GEOL 45200. INDEPENDENT STUDY THESIS – SEMESTER TWO
An original geological investigation is required. An oral presentation is given to the department. Projects result in a thesis and an oral defense. *Prerequisite: GEOL 45100.*

GEOLOGY SEMINAR
All senior Geology majors pursuing thesis research attend and participate in a weekly departmental seminar. Each student presents a synopsis of her or his research and leads a discussion. This presentation provides experience in oral communication and criticism in a scientific context. All junior and senior Geology majors are required to attend these seminars; other majors are encouraged to attend. Thursdays, 11:00 a.m. to 12:00 noon, Scovel 205.

CROSS-LISTED COURSES ACCEPTED FOR GEOLOGY CREDIT

BIOL 36000. EVOLUTION