Geology

Department Chemistry & Geology

GEOL 201 Elements of Mineralogy (4)
GEOL 122 Earth History (4)
GEOL 121 Physical Geology (4)

Required for Minor

GEOL MAJOR - See Earth Science Major

GEOL 202 (4) Petrology
Study of the compositions and origins of igneous, sedimentary, and metamorphic rocks in a plate tectonic context. Topics include mineral optics and geochemistry. Lab portion of course emphasizes identification and study of rocks.
Pre: GEOL 201
Spring

GEOL 305 (2) Earth Science for Elementary Educators
An integrated, multi-disciplinary study of the Earth and the solar system. The course builds on basic concepts of astronomy, physical geography, and geology to give students a thorough understanding of the Earth and its place in the solar system. Learning outcomes partially fulfill licensure requirements for elementary educators. This course is focused on content.
Pre: BIOL 100, PHYS 101
Fall, Spring

GEOL 310 (3) Earth and Space Systems
An integrated, multi-disciplinary study of the Earth and the solar system. The course builds on basic concepts of astronomy, chemistry and geology to give students an enhanced understanding of the nature and relationship among the forces that control the Earth’s evolution. Learning outcomes partially fulfill licensure requirements for secondary science educators.
Pre: AST 101, CHEM 201, GEOL 121
Fall

GEOL 320 (4) Sedimentology and Stratigraphy
Focused studies of the origins and processes of transportation, deposition, burial and diagenesis of sedimentary materials. Lab assignments focus on sedimentary material identification and analysis. Field trips required.
Pre: GEOL 121
Fall

GEOL 330 (4) Structural Geology
Study of processes and results of rock deformation at scales ranging from microscopic to plate tectonic, and at conditions ranging from the Earth’s surface to the deep interior.
Pre: GEOL 121
Fall

GEOL 350 (4) Environmental Geology
The application of geologic data and principles to problems created by human occupancy and use of the physical environment. Lecture and laboratory topics include soil classification and conservation, hazardous waste site evaluation and remediation, and living with geologic hazards.
Pre: GEOL 121
ALT-Spring

GEOL 351 (2) Engineering Geology
This course focuses on the application of geologic data and principles created by human occupancy and use of the physical environment. This course meets concurrently with GEOL 350 Environmental Geology through the last eight weeks of the semester. It is intended for civil engineering students that previously completed Geotechnical Engineering, CIVE 360.
Pre: GEOL 121, CIVE 360, or instructor permission
ALT-Spring

GEOL 370 (2) Geotectonics
Expanded discussions of several topics introduced in Physical Geology and Structural Geology. Topics include plate tectonics, deep earth structure, seismicity, mountain building, and continental growth.
Pre: GEOL 121 and GEOL 330
Variable
GEOL 401 (1-3) Field Studies
This course is devoted to the study and practice of geological field investigations. Students will first learn basic field investigative methods. Students will then be appropriately versed in the geological history and importance of a region selected for in-depth study. Finally, students will participate in a field trip to a regional site of geologic importance over an extended weekend (4-6 days). Potential study sites may include Minnesota’s North Shore and Iron Range, the Badlands and Black Hills of South Dakota, the Ozarks, or the Rocky Mountains.
Pre: GEOL 100 or GEOL 121 and GEOL 122
Variable

GEOL 430 (3) Petroleum and Ore Deposit Geology
Comprehensive survey of ore deposit and petroleum geology, including exploration and production technologies. Course emphasizes projects using industry data.
Pre: GEOL 121, GEOL 201, GEOL 122
Coreq: GEOL 320, GEOL 302, GEOL 330
Variable

GEOL 440 (4-8) Geology Field Camp
Geologic field mapping and interpretation in diverse settings. Course is offered by universities throughout the U.S. and elsewhere.
Pre: GEOL 121, GEOL 122, GEOL 201, GEOL 320, GEOL 330
Summer

GEOL 450 (3) Hydrogeology
This course introduces physical and chemical studies of hydrogeology. The main areas of discussion will include the physical and chemical attributes of aquifers, movement of ground-water and solute through soils and rocks, and reactions between earth materials and pollutants in ground-water systems. The class includes extensive use of MODFLOW and MT3D, the two most commonly used groundwater modeling programs currently available.
Pre: CHEM 201, GEOL 121
ALT-Spring

GEOL 479 (4) Teaching Earth Sciences
Material and methods of earth science study directed toward future teachers of students in junior high and high schools.
Pre: GEOL 121, GEOG 217 or instructor permission
Variable

GEOL 490 (1-4) Workshop

GEOL 499 (1-5) Individual Study