

# ALL COURSES

## GEOLOGY

### **GEOL 4XXX: GEOLOGY TRANSFER ELECTIVE**

Credit transferred from another institution and articulated for geology upper division elective.

### **GEOL 3XXX: GEOLOGY TRANSFER ELECTIVE**

Credit transferred from another institution and articulated for geology upper division elective.

### **GEOL 2XXX: GEOLOGY TRANSFER ELECTIVE**

Credit transferred from another institution and articulated for geology lower division elective.

### **GEOL 1XXX: GEOLOGY TRANSFER ELECTIVE**

Credit transferred from another institution and articulated for geology lower division elective.

### **GEOL 1004: Essentials of Earth Science**

ACTS Common Course - PHSC 1104

An introduction to the fundamental topics of earth science including physical and historical geology, oceanography, meteorology, and astronomy. Laboratory exercises will serve to enhance/support lecture topics. Laboratory work will stress the use of the scientific method of problem solving. This course is designed as a general education science requirement and for prospective elementary and middle level educators.

Note: Duplicate credit for GEOL 1004 Essentials of Earth Science and GEOL 1014 Physical Geology will not be allowed.

Lecture three hours, laboratory two hours. \$40 laboratory fee.

### **GEOL 1014: Physical Geology**

ACTS Common Course - GEOL 1114

A survey of the earth's features and processes which include minerals, rocks, plate tectonics, geologic time, earthquakes, volcanoes, groundwater, development of landscapes, erosion, and climate change. Laboratory exercises will serve to support/enhance lecture topics.

Note: Duplicate credit for GEOL 1014 Physical Geology and GEOL 1004 Essentials of Earth Science will not be allowed.

Lecture three hours, laboratory three hours. \$40 laboratory fee.

### **GEOL 2001: Seminar**

Prerequisites: GEOL 1014 Physical Geology and GEOL 2001 Seminar

Participants will prepare oral and written reports and participate in discussions of the reports. Topics for the seminar will be determined by the instructors but will be subjects which are beyond the scope of other geology courses.

### **GEOL 2024: Historical Geology**

ACTS Common Course - GEOL 1134

Offered: Spring

Prerequisite: GEOL 1014 Physical Geology

A survey of the geological and biological history of the Earth through interpretation of the sedimentary rock record, fossils, paleo geographic maps, geologic maps, and cross-sections. Laboratory and field exercises enhance lecture subjects.

Lecture three hours, laboratory three hours. \$40 laboratory fee.

### **GEOL 2111: Environmental Seminar**

Cross-listed: BIOL 2111 Environmental Seminar, CHEM 2111 Environmental Seminar

Offered: Spring of odd years

A seminar for students pursuing the environmental option of geology, biology, or chemistry and other students interested in environmental sciences.

### **GEOL 3001: Seminar**

Prerequisites: GEOL 1014 Physical Geology and GEOL 2001 Seminar

Participants will prepare oral and written reports and participate in discussions of the reports. Topics for the seminar will be determined by the instructors but will be subjects which are beyond the scope of other geology courses.

### **GEOL 3004: Structural Geology**

Offered: Spring

Prerequisites: GEOL 1014 Physical Geology and GEOL 2024 Historical Geology

A study and analysis of the structural features of the earth's crust.

Lecture three hours, laboratory two hours. \$40 laboratory fee.

### **GEOL 3014: Mineralogy**

Offered: Fall

Prerequisites: GEOL 1014 Physical Geology, CHEM 1113 A Survey of Chemistry, CHEM 1111 Survey of Chemistry Laboratory or CHEM 2124 General Chemistry I. GEOL 2024 Historical Geology recommend.

A study of crystallography, physical and chemical properties, origin, occurrence, and structure theory of minerals.

Lecture two hours, laboratory four hours. \$40 laboratory fee.

### **GEOL 3023: Geologic Field Techniques**

Offered: Fall

Prerequisites: GEOL 1014 Physical Geology, GEOL 2024 Historical Geology and GEOL 3004 Structural Geology

Interpretation of aerial photographs; mensuration techniques using the Brunton compass, hand level, and Jacob's staff, measurement and description of stratigraphic sections; construction of and geologic maps; collecting, sampling, and collation procedures.

Lecture/laboratory four hours. \$40 laboratory fee.

### **GEOL 3044: Geomorphology**

Offered: Fall

Prerequisites: GEOL 1014 Physical Geology, GEOL 2024 Historical Geology, GEOL 3004 Structural Geology

A study of land forms and the processes which shape the earth's surface. Special emphasis will be placed on slope forming and fluvial processes.

Lecture three hours, laboratory three hours. \$40 laboratory fee.

### **GEOL 3053: Geology of Ore Deposits**

Offered: Fall of even years

Prerequisites: GEOL 1014 Physical Geology, GEOL 3014 Mineralogy, and GEOL 3164 Petrology

A study of the principal earth materials essential to local and national economies. Location, genesis, methods of extraction, and primary utilization and conservation are emphasized.

### **GEOL 3083: Hydrogeology**

Offered: Fall of odd years

Prerequisites: MATH 1113 College Algebra and GEOL 1014 Physical Geology or permission of the instructor.

The earth's hydrologic system is studied in terms of both empirical and quantitative aspects of the steady-state condition of groundwater and its interaction with surface water, as well as transient behavior from the influence of wells. Basic water chemistry is also covered along with transport and fate of pollutants in groundwater.

### **GEOL 3111: Environmental Seminar**

Cross-listed: BIOL 3111 Environmental Seminar, ENVS 3111 Environmental Seminar, and CHEM 3111 Environmental Seminar

Offered: Spring of odd years

A seminar for students pursuing the environmental option of geology, biology, or chemistry and other students interested in environmental sciences.

### **GEOL 3124: Invertebrate Paleontology**

Offered: Spring of odd years

Prerequisite: GEOL 2024 Historical Geology

A systematic study of invertebrate fossils and their geologic significance.

Lecture laboratory six hours. \$40 laboratory fee.

### **GEOL 3153: Environmental Geology**

Offered: Fall

Prerequisite: GEOL 1014 Physical Geology

A study of the geological factors which influence the pollution of land, water, and biological resources; the role of rock and soil in the geobiological community; hydrology; land sliding and faulting in the human environment, natural resource problems; urban and land use planning based on geological data.

### **GEOL 3164: Petrology**

Offered: Spring

Prerequisite: GEOL 3014 Mineralogy

A study of the classification, origin, geologic occurrence, physical and chemical properties of igneous, sedimentary, and metamorphic rocks.

Lecture three hours, laboratory three hours. \$40 laboratory fee.

### **GEOL 3174: Computer Applications in Geology**

Offered: Spring of odd years

Prerequisites: GEOL 1014 Physical Geology, GEOL 2024 Historical Geology, FW/GEOG 2833 Introduction to Geographic Information Systems, COMS 1003 Introduction to Computer Based Systems

Participants will focus on mastering common geotechnical, oil and gas, and Geographic Information Systems (GIS) software utilized throughout the geologic profession. Course will include techniques on GIS analysis; generating stratigraphic sections, cross-sections, structure contours, fence diagrams, rose diagrams, and other geologic documents; geologic data management.

\$40 course fee.

### **GEOL 4001: Seminar**

Prerequisites: GEOL 1014 Physical Geology and GEOL 2001 Seminar

Participants will prepare oral and written reports and participate in discussions of the reports. Topics for the seminar will be determined by the instructors but will be subjects which are beyond the scope of other geology courses.

\$100 exam fee.

### **GEOL 4006: Field Geology**

Offered: Each summer by arrangement

Prerequisites: GEOL 1014 Physical Geology, GEOL 2024 Historical Geology, GEOL 3004 Structural Geology, GEOL 3014 Mineralogy, GEOL 3023 Geologic Field Techniques, GEOL 3124 Invertebrate Paleontology, and GEOL 3164 Petrology

A six week summer course of instruction in the use of geologic mapping instruments, interpretation of aerial photographs and their use in the construction of geologic maps, development of techniques necessary in geological field work, recognition and interpretation of geologic phenomena, and potentially in environmental evaluation. The course is offered through arrangements with various universities. Students have the option of picking the field camp that best meets their interest from a list of pre-approved camps.

Note: Field camp expenses will vary, but the average cost for room/board and tuition is \$3,000.

\$40 laboratory fee.

### **GEOL 4023: Principles of Stratigraphy and Sedimentation**

Offered: Fall

Prerequisite: GEOL 3164 Petrology

A study of sediments, sedimentary environments, and the stratigraphic relationships among sedimentary rock layers.

### **GEOL 4034: Subsurface Geology**

Offered: Spring of even years

Prerequisites: GEOL 3004 Structural Geology, GEOL 3164 Petrology, GEOL 4023 Principles of Stratigraphy and Sedimentation, MATH 1113 College Algebra

A study of analytic procedures in selected topics in geophysics, well logging, and subsurface geological relationships.

Lecture three hours, laboratory two hours. \$40 laboratory fee.

### **GEOL 4043: Geochemistry**

Offered: Fall of odd years

Prerequisites: GEOL 3014 Mineralogy, CHEM 2124 General Chemistry I, and CHEM 2134 General Chemistry II

Primarily low-temperature geochemistry with some high-temperature geochemical principles: aqueous geochemistry (including carbonate equilibria), biogeochemical cycles, basic organic chemistry, thermodynamics, phase diagrams, major and trace-element geochemistry, stable and radiogenic isotopic geochemistry (as applied primarily to low-, but also to high-temperature geochemistry). Applications to fresh surface water, ground water, oceans, air (climate), interactions with solid rock, as well as geochemical evolution of the Earth.

### **GEOL 4111: Environmental Seminar**

Cross-listed: BIOL 4111 Environmental Seminar, CHEM 4111 Environmental Seminar

Offered: Spring of odd years

A seminar for students pursuing the environmental option of geology, biology, or chemistry and other students interested in environmental sciences.

### **GEOL 4433: Advanced Topics in Geology**

Prerequisite: Consent of Instructor

Various advanced topics from any specialty area in geology.

Note: May be repeated for credit if course content differs.

### **GEOL 4434: Advanced Topics in Geology**

Prerequisite: Consent of Instructor

Various advanced topics from any specialty area in geology.

Note: May be repeated for credit if course content differs.

\$40 laboratory fee.

### **GEOL 4951: Undergraduate Research in Geology**

Offered: On demand

Prerequisite: Departmental approval

Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.

\$40 laboratory fee.

**GEOL 4952: Undergraduate Research in Geology**

Offered: On demand

Prerequisite: Departmental approval

Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.

\$40 laboratory fee.

**GEOL 4953: Undergraduate Research in Geology**

Offered: On demand

Prerequisite: Departmental approval

Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.

\$40 laboratory fee.

**GEOL 4954: Undergraduate Research in Geology**

Offered: On demand

Prerequisite: Departmental approval

Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.

\$40 laboratory fee.

**GEOL 4991: Special Problems in Geology**

Open to geology majors with the approval of the department head.

\$40 laboratory fee.

**GEOL 4992: Special Problems in Geology**

Open to geology majors with the approval of the department head.

\$40 laboratory fee.

**GEOL 4993: Special Problems in Geology**

Open to geology majors with the approval of the department head.

\$40 laboratory fee.

**GEOL 4994: Special Problems in Geology**

Open to geology majors with the approval of the department head.

\$40 laboratory fee.