

GEOLOGY (GEOL)

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

Note: Duplicate credit for GEOL 1004 and GEOL 1014 will not be allowed.

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.

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

Note: Duplicate credit for GEOL 1014 and GEOL 1004 will not be allowed.

GEOL 2001 Seminar

Prerequisite: GEOL 1014 and GEOL 2001.

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.

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, CHEM 2111.

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

Prerequisite: GEOL 1014 and GEOL 2001.

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.

Prerequisite: GEOL 1014 and GEOL 2024.

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.

Prerequisite: GEOL 1014, CHEM 1113, CHEM 1111 or CHEM 2124.

GEOL 2024 recommended. 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.

Prerequisite: GEOL 1014, GEOL 2024 and GEOL 3004.

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.

Prerequisite: GEOL 1014, GEOL 2024, GEOL 3004.

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.

Prerequisite: GEOL 1014, GEOL 3014, and GEOL 3164.

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.

Prerequisite: MATH 1113 and GEOL 1014 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, ENVS 3111, and CHEM 3111.

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.

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.

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.

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.

Prerequisite: GEOL 1014, GEOL 2024, FW/GEOG 2833, COMS 1003.

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

Prerequisite: GEOL 1014 and GEOL 2001 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.

Prerequisite: GEOL 1014, GEOL 2024, GEOL 3004, GEOL 3014, GEOL 3023, GEOL 3124, and GEOL 3164.

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. \$40 laboratory fee.

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

GEOL 4023 Principles of Stratigraphy and Sedimentation

Offered: Fall.

Prerequisite: GEOL 3164.

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

GEOL 4034 Subsurface Geology

Offered: Spring of even years.

Prerequisite: GEOL 3004, GEOL 3164, GEOL 4023, MATH 1113.

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.

Prerequisite: GEOL 3014, CHEM 2124, and CHEM 2134.

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, CHEM 4111.

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. \$40 laboratory fee.

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

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.

GEOL 6881 Workshop

The workshop will require the equivalency of fifteen clock hours of instruction per credit hour.

GEOL 6882 Workshop

The workshop will require the equivalency of fifteen clock hours of instruction per credit hour.

GEOL 6883 Workshop

The workshop will require the equivalency of fifteen clock hours of instruction per credit hour.

GEOL 6884 Workshop

The workshop will require the equivalency of fifteen clock hours of instruction per credit hour.