

Geology Courses

Courses

GEOL 1103. Lab for GEOL 1313.

Laboratory for Geology 1313: [TCCN GEOL1103] Concurrent enrollment in GEOL 1313 suggested. Course fee required.

Department: Geology

1 Credit Hour

2 Total Contact Hours

2 Lab Hours

0 Lecture Hours

0 Other Hours

GEOL 1104. Lab for GEOL 1314.

Laboratory for Geology 1314: [TCCN GEOL 1104] Concurrent enrollment in GEOL 1314 Course fee required.

Department: Geology

1 Credit Hour

2 Total Contact Hours

2 Lab Hours

0 Lecture Hours

0 Other Hours

GEOL 1111. Principles of Earth Sci - Lab.

Laboratory for Geology 1211. [TCCN GEOL 1101] Course fee required.

Department: Geology

1 Credit Hour

2 Total Contact Hours

2 Lab Hours

0 Lecture Hours

0 Other Hours

Corequisite(s): GEOL 1211

GEOL 1112. Laboratory for Geology 1212.

Laboratory for Geology 1212. [TCCN GEOL 1102] Course fee required.

Department: Geology

1 Credit Hour

2 Total Contact Hours

2 Lab Hours

0 Lecture Hours

0 Other Hours

Corequisite(s): GEOL 1212

GEOL 1211. Principles of Earth Sciences.

This course serves as an introduction to the topics of earth materials, plate tectonics, earthquakes, volcanoes, earth's atmosphere and climate.

Corequisite: GEOL 1111.

Department: Geology

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

2 Lecture Hours

0 Other Hours

Corequisite(s): GEOL 1111

GEOL 1212. Principles of Earth Science.

Study of the earth as a planet. A survey of earth history as interpreted from and exhibited by plants, animals, rocks, and minerals; a study of the earth in space; a survey of the physical processes operating in the hydrosphere. Includes an introduction to historical geology, astronomy, physiography, and oceanography. Prerequisite: GEOL 1211 with a grade of "C" or better, may be taken concurrently. Corequisite: GEOL 1112.

Department: Geology

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

2 Lecture Hours

0 Other Hours

Corequisite(s): GEOL 1112

GEOL 1230. The Blue Planet.

An introduction to the topics of earth system science, exploring interactions within solid earth, water, atmosphere, and life, as well as impact of Earth systems on human society and viceversa. May not be counted toward Geology or Environmental Science Major.

Department: Geology

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

2 Lecture Hours

0 Other Hours

GEOL 1231. Natural Hazards.

Geologic events that affect everyday life, including global warming, earthquakes, volcanism, desertification, river and coastline flooding and erosion, groundwater, mineral resources, and plate tectonics. May not be counted toward a Geology or Environmental Science Major.

Department: Geology

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

2 Lecture Hours

0 Other Hours

GEOL 1313. Intro to Physical Geology.

Introduction to Physical Geology (3-0) (C) An introductory study of the earth's composition, structure, and internal and external processes. Concurrent enrollment in laboratory (GEOL 1103) suggested but not required. A student may not receive credit for both GEOL 1313 and GEOL 1311 or GEOL 1211.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOL 1314. Intro to Historical Geol.

Introduction to Historical Geology: [TCCN GEOL 1304] An integrated study of the geologic history of the earth with a consideration of the history of life as documented by the fossil record. Concurrent enrollment in laboratory (GEOL 1104) suggested but not required. A student may not receive credit for both GEOL 1312 and GEOL 1314.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOL 2109. Mineralogy & Petrology Lab.

Principles of crystal chemistry, phase equilibrium, and crystallography of common rock-forming minerals. Mineral and rock examination in hand samples and field trips, and problem solving. Prerequisite: CHEM 1305 with a grade of "C" or better. Corequisite: GEOL 2309. Course fee required.

Department: Geology

1 Credit Hour

3 Total Contact Hours

3 Lab Hours

0 Lecture Hours

0 Other Hours

Prerequisite(s): (CHEM 1305 w/C or better)

Corequisite(s): GEOL 2309

GEOL 2309. Mineralogy & Petrology.

Principles of crystal chemistry, phase equilibrium, and crystallography of common rock-forming minerals. Mineral and rock examination in hand samples and field trips, and problem solving. Prerequisite: CHEM 1305 with a grade of "C" or better. Corequisite: GEOL 2109.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (CHEM 1305 w/C or better)

Corequisite(s): GEOL 2109

GEOL 3112. Geoscience Processes Lab.

Survey and synthesis of principals of physical and historical geology, including tectonic, geophysical, structural, stratigraphic, and petrologic concepts and processes. Emphasis on field-oriented, problem-solving studies, including: analysis of outcrops and the development of multiple working hypotheses; construction of geologic maps and other skills used in geologic field work; study of landforms and the processes that create them.

Prerequisites: GEOL 1313/1103 or GEOL 1311 or GEOL 1211/1111 GEOL 1314/1104 or GEOL 1312 or GEOL 1212/1112; Concurrent enrollment in GEOL 2309/2109 is recommended. Corequisite: GEOL 3312.

Department: Geology

1 Credit Hour

3 Total Contact Hours

3 Lab Hours

0 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 1103 w/C or better AND GEOL 1313 w/C or better) OR (GEOL 1111 w/C or better AND GEOL 1211 w/C or better) AND (GEOL 1104 w/C or better AND GEOL 1314 w/C or better) OR (GEOL 1112 w/C or better AND GEOL 1212 w/C or better)

Corequisite(s): GEOL 3312

GEOL 3115. Igneous/Metamorphic Petr. Lab.

Petrogenesis of Igneous and metamorphic rocks as studies by the petrology of samples in thin sections, by field work, and by computer-based exercises. Prerequisites: GEOL 2309/2109 or GEOL 2411; and CHEM 1305. Corequisite: GEOL 3215. Course fee required.

Department: Geology

1 Credit Hour

3 Total Contact Hours

3 Lab Hours

0 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 2309 w/D or better) OR (GEOL 2109 w/D or better) OR (CHEM 1305 w/D or better)

Corequisite(s): GEOL 3215

GEOL 3123. Structural Geology Lab.

A field and laboratory class applying principals learned in GEOL 3323, Structural Geology, to real world problems. Introduction to recognition of geologic sturcture on geologic maps, geologic mapping, and cross-section construction; use of stereographic projection for solving geometric problems; introduction to GIS for geologic mapping and techniques for 3D structural analysis. Course fee req. Prerequisites: GEOL 3312 or GEOL 3412; GEOL 1313 or 1311 or GEOL 1211/1111; and GEOL 1314 or 1312 or GEOL 1212/1112. Corequisite: GEOL 3323.

Department: Geology

1 Credit Hour

3 Total Contact Hours

3 Lab Hours

0 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 2309 w/D or better) OR (GEOL 2109 w/D or better) OR (GEOL 3312 w/C or better) OR (GEOL 3112 w/C or better)

Corequisite(s): GEOL 3323

GEOL 3126. Lab for Sedim & Stratigraphy.

Study of sedimentary processes, environments, and deposits, including fundamental concepts of stratigraphy and sequence stratigraphy. Ancient deposits and modern analogs are examined in the field. Laboratory will be divided between field trips and in-lab activity to introduce techniques for the study of sediments and sedimentary rock sequences. Transportation fee required. Prerequisites: GEOL 2411 or GEOL 2309/2109; and and GEOL 3412 or GEOL 3312/3112. Corequisite: GEOL 3326.

Department: Geology

1 Credit Hour

3 Total Contact Hours

3 Lab Hours

0 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 2109 w/C or better AND GEOL 2309 w/C or better) AND (GEOL 3112 w/C or better AND GEOL 3312 w/C or better) OR (GEOL 3412 w/C or better)

Corequisite(s): GEOL 3326

GEOL 3215. Igneous/Metamorphic Petrology.

Petrogenesis of Igneous and metamorphic rocks, including the thermodynamics and physical properties of minerals and melts. Prerequisites: GEOL 2309/2109 or GEOL 2411; and CHEM 1305. Corequisite: GEOL 3115.

Department: Geology

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

2 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 2109 w/C or better AND GEOL 2309 w/C or better) AND (GEOL 3112 w/C or better AND GEOL 3312 w/C or better)

Corequisite(s): GEOL 3115

GEOL 3312. Geoscience Processes.

Survey and synthesis of principals of physical and historical geology, including tectonic, geophysical, structural, stratigraphic, and petrologic concepts and processes. Emphasis on field-oriented, problem-solving studies, including: analysis of outcrops and the development of multiple working hypotheses; construction of geologic maps and other skills used in geologic field work; study of landforms and the processes that create them. Prerequisite: GEOL 1313/1103 or GEOL 1311 or GEOL 1211/1111; GEOL 1314/1104 or GEOL 1312 or GEOL 1212/1112. Concurrent enrollment in GEOL 2309/2109 recommended. Corequisite: GEOL 3112.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 1313 w/C or better) OR (GEOL 1211 w/C or better) AND (GEOL 1314 w/C or better) OR (GEOL 1212 w/C or better)

Corequisite(s): GEOL 3112

GEOL 3321. Geology for Engineers.

Geology for Engineers (2-3) The principles of physical geology and their practical applications to civil engineering. This course may not count toward a major or minor in geology. Prerequisite: Junior standing in engineering or department approval. .

Department: Geology

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

GEOL 3323. Structural Geology.

An introduction to the recognition, description and analysis of deformed rocks, spanning the spectrum from microscopic structures to mountain belts and plate tectonics. Geometric and stereographic analysis of map-scale structures. Introduction to stress, strain and constitutive laws for rocks. Processes of rock deformation including folding, fracturing and grain-scale processes. Correlation of structural styles with tectonic environments. Prerequisites: GEOL 3312/3112 or GEOL 3412; GEOL 1311 or 1313 or 1211/1111; and GEOL 1312 or 1212/1112 or 1314. Corequisite: GEOL 3123.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 2109 w/C or better AND GEOL 2309 w/C or better) AND (GEOL 3112 w/C or better AND GEOL 3312 w/C or better)

Corequisite(s): GEOL 3123

GEOL 3326. Sedimentology & Stratigraphy.

Study of sedimentary processes, environments, and deposits, including fundamental concepts of stratigraphy and sequence stratigraphy. Ancient deposits and modern analogs are examined in the field. Prerequisites: GEOL 2411 or GEOL 2309/2109; and GEOL 3412 or GEOL 3312/3112; or instructor approval. Corequisite: GEOL 3126.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 2109 w/C or better AND GEOL 2309 w/C or better) AND (GEOL 3112 w/C or better AND GEOL 3312 w/C or better)

Corequisite(s): GEOL 3126

GEOL 4166. Directed Study, Geology.

Directed Study, Geology (0-0-1) Directed study problems in geology; hours and subjects to be arranged with each student; for undergraduate students who wish to do work on a special problem. No student may receive credit for more than six hours of directed study work. Application of a directed study towards required upper-division elective hours in the major is subject to prior approval by the departmental undergraduate studies committee. Prerequisites: Junior standing and department approval.

Department: Geology

1 Credit Hour

1 Total Contact Hour

0 Lab Hours

0 Lecture Hours

1 Other Hour

GEOL 4189. Research in Geological Science.

Research in Geological Sciences (0-0-1) This course provides undergraduates with a research experience working with a faculty mentor. It cannot be used to satisfy minimum degree requirements. Grade of Pass/Fail. Prerequisite: Juniors standing.

Department: Geology

1 Credit Hour

1 Total Contact Hour

0 Lab Hours

0 Lecture Hours

1 Other Hour

GEOL 4266. Directed Study, Geology.

Directed Study, Geology (0-0-2) Directed study problems in geology; hours and subjects to be arranged with each student; for undergraduate students who wish to do work on a special problem. No student may receive credit for more than six hours of directed study work. Application of a directed study towards required upper-division elective hours in the major is subject to prior approval by the departmental undergraduate studies committee.

Prerequisite: Department approval and junior standing.

Department: Geology

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

0 Lecture Hours

2 Other Hours

GEOL 4308. Paleoclimatology.

Investigation of methods and data sources used to reconstruct Earth's climate history through geological time. Emphasis is placed on the sedimentary record (marine sediments, lacustrine sediments, ice cores) of the Cenozoic Era. Actual data, scientific literature and core samples are used to describe and interpret paleoclimates through case studies.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 3326 w/C or better) OR (GEOL 3308 w/C or better)

GEOL 4315. Topics in Geological Sciences.

Topics in Geological Sciences (3-0) Study of topics in fields such as structural geology, environmental geosciences, economic geology, paleontology, petrology, and geochemistry. May be repeated when topics vary. Prerequisites: Junior standing.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOL 4316. Geochemistry.

Geochemistry (3-0) Low-temperature aqueous geochemistry emphasizing the chemistry and chemical processes in ground and surface water and in aqueous solutions. Emphasis on surface and ground water important as water supplies or supporting important ecosystems, rock- and soil-fluid interactions important in determining water chemistry, and waste-rock-fluid system chemistry and processes. Prerequisites: CHEM 1305, CHEM 1306 and junior standing.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (CHEM 1305 w/C or better) AND (CHEM 1306 w/C or better)

GEOL 4335. Soil Properties & Genesis.

This course centers on the overlap of soil science and geology. Our goal is to explain the fundamental principles in soil sciences, introduce the concept of critical zone, where water, rock, biology, and atmosphere interact as a system, understand: (1) how the interactions of landform, topography, climate, and biota result in patterns of soil development and the distribution of soils that we observe within the landscape; (2) how physical, chemical and biological properties of soils affect water and nutrient availability to plants.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (CHEM 1305 w/C or better) AND (GEOL 1313 w/C or better) OR (GEOL 1212 w/C or better)

GEOL 4366. Directed Study, Geology.

Directed Study, Geology (0-0-3) Directed study problems in geology; hours and subjects to be arranged with each student; for undergraduate students who wish to do work on a special problem. No student may receive credit for more than six hours of directed study work. Application of a directed study towards required upper-division elective hours in the major is subject to prior approval by the departmental undergraduate studies committee. Prerequisites: Department approval and junior standing.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

0 Lecture Hours

3 Other Hours

GEOL 4373. Grndwater Contam and Reclam.

Groundwater Contamination and Reclamation (3-0) Contamination fate and transport in the groundwater. Includes the application of remediation methods for various types of contaminants and the discussion of reclamation methods.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOL 4375. Field Geology I.

Field Geology I (0-0-16) A three-week course in Field Geology, emphasizing geologic mapping methods and techniques; preparation of stratigraphic sections, geologic maps, and geologic cross-sections. Weekly written reports, in professional style, will be required. Restricted to majors: GEOL or GEOP. Prerequisites: GEOL 3315, GEOL 3423 and GEOL 3425. Transportation fee required. .

Department: Geology

3 Credit Hours

16 Total Contact Hours

0 Lab Hours

0 Lecture Hours

16 Other Hours

Prerequisite(s): (GEOL 3125 w/C or better AND GEOL 3325 w/C or better) OR (GEOL 3425 w/C or better) AND (GEOL 3123 w/C or better AND GEOL 3323 w/C or better) OR (GEOL 3423 w/C or better)

GEOL 4376. Field Geology II.

Field Geology II (0-0-16) A three-week course in advanced Field Geology utilizing GIS tools, computer-aided mapping, and use of air photos in geologically complex projects. Weekly written reports, in professional style, will be required of all students. Restricted to majors: Geology or Geophysics. Prerequisite: GEOL 4375 with a grade of "C" or better. Transportation fee required.

Department: Geology

3 Credit Hours

16 Total Contact Hours

0 Lab Hours

0 Lecture Hours

16 Other Hours

Prerequisite(s): (GEOL 4375 w/C or better)

GEOL 4383. General Hydrogeology.

The overall objective of this course is to provide an introduction to the basic principles of hydrologic cycles and groundwater flow. The course will emphasize flow in confined and unconfined aquifer, pump test design and analysis, the transport of contaminants and the use of computer models to simulate saturated groundwater flow. We will also perform simple experiments to better understand the concepts of groundwater flows and pump tests. Case studies for groundwater contamination and remediation will be also discussed.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 3321 w/C or better) OR (GEOL 2109 w/C or better) AND (GEOL 2309 w/C or better) OR (ESCI 3306 w/C or better) AND (MATH 2326 w/C or better)

GEOL 4384. Nuclear Fuel Cycle.

Nuclear Fuel Cycle (3-0) Examination of the problems involved in the control of nuclear waste. Characterization, treatment, shipping and permanent disposal of the nuclear waste will be discussed. The problems of decontamination, decommissioning, and site restoration, as well as quality assurance and control of nuclear waste, will be examined. Prerequisite: Upper-division standing in the College of Science or the College of Engineering, or department approval.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOL 4385. Introduction to GIS.

Introduction to GIS (2-3) Introduction to the principals and applications of Geographic Information Systems (GIS). Topics include the importance of validated data bases, GIS design, data structures, producing map products, and spatial analysis. The laboratory will focus on the application of a common GIS software package to science and engineering projects. Prerequisites: GEOL 1313-1103 or GEOL 1311 or GEOG 1306-1106.

Department: Geology

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOL 1103 w/C or better AND GEOL 1313 w/C or better) OR (GEOG 1106 w/C or better AND GEOG 1306 w/C or better) OR (GEOL 1111 w/C or better AND GEOL 1211 w/C or better)

GEOL 4389. Research in Geological Science.

Research in Geological Sciences (0-0-3) This course provides undergraduates with a research experience working with a faculty mentor. It cannot be used to satisfy minimum degree requirements. Grade of pass/fail. Prerequisite: Junior standing.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

0 Lecture Hours

3 Other Hours

GEOL 4390. Intrnshp Geological Sciences.

Internship in Geological Science (0-0-3) Practical on-the-job experience in federal, state, city/county governmental and/or private agencies or industries. Restricted to majors: GEOL, GEOP. Prerequisites: GEOL 3412 with a grade of "C" or better and department approval.

Department: Geology

3 Credit Hours

6 Total Contact Hours

0 Lab Hours

0 Lecture Hours

6 Other Hours

Prerequisite(s): (GEOL 3112 w/C or better AND GEOL 3312 w/C or better)

GEOL 4399. Senior's Thesis.

Senior's Thesis (0-0-3) Guided program of research culminating in the writing of a senior thesis. Prerequisite: Junior standing.

Department: Geology

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

0 Lecture Hours

3 Other Hours