

COURSE OUTLINE**Geology 104
Field Geology****I. Catalog Statement**

Geology 104 is a field study of geologic features within several geologic provinces. Emphasis is placed on the recognition, interpretation, recording and reporting of geologic information observed in the field. Petrologic, paleontologic, structural, and stratigraphic information is compiled and integrated into an interpretation of the geologic history of the area investigated.

An extended period in the field may be substituted for a number of shorter field trips. Field trips will normally be taken on weekends and/or during vacation periods. The itinerary, schedule, and field area will be determined at the first class meeting (see current class schedule). The student is responsible for the cost of food and transportation; the approximate cost is \$35 for each two units of work; this figure may vary considerably depending on the location of the study area. Travel is usually by chartered bus. Field Geology requires a great deal of rigorous activity and living conditions in the field are often primitive. Lecture and field study will be the semester equivalent of one hour of lecture and three hours of laboratory per week for each two units of credit; a typical semester of work includes 16 hours of lecture and six days in the field.

Units – 2.0-6.0

Prerequisite: Completion of one of the following courses with a grade of "C" or better: Geology 101, 102, 103, 105; Oceanography 115; Paleontology 101; or equivalent.

Note: Two units of non-overlapping field study will be offered for the fall and spring semesters; extended periods of study may be available during summer session. Weather conditions may require rescheduling of some trips. The student may repeat Geology 104 until a total of 6 units has been earned.

II. Objectives

Students will be able to:

1. Understand and appreciate the processes which continue to shape the earth
2. Analyze global problems from a geological perspective

IV. Course Outline

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| A. Recording of Data | 2 hours |
| 1. Measurement of strike and dip | |
| 2. Roadlog information | |
| 3. Notetaking and diagram construction | |
| B. Rock Type Identification | 2 hours |
| 1. Field characteristics of rock types | |
| 2. Outcrop features and recognition criteria | |
| C. Geomorphology of Field Area | 2 hours |
| 1. Relationships between structure and land forms | |
| 2. Erosional land form development | |
| 3. Constructional land forms | |
| D. Structural Features | 2 hours |
| 1. Faulting in area | |
| 2. History of faulting and genesis | |
| 3. Features associated with faults | |
| 4. Fold types in area | |
| 5. History of folding | |
| E. Stratigraphy of Area | 2 hours |
| 1. Formation sequence | |
| 2. Description of formations | |
| 3. Study of sedimentary structures | |
| 4. Unconformities and their significance | |
| F. Paleontology of Formations | 2 hours |
| 1. Fossil collections | |
| 2. Fossil identification | |
| 3. Environmental implications of fossils | |
| G. Igneous Rocks | 2 hours |
| 1. Dikes and sills | |
| 2. Batholiths and stocks | |
| 3. Contact relationships | |
| 4. History of igneous activity | |
| H. Metamorphic Rocks | 2 hours |
| 1. Structure | |
| 2. Relation to igneous intrusions | |
| 3. Metamorphic structures | |
| I. Economic geology | 2 hours |
| 1. Oil and gas fields | |
| 2. Mines | |
| 3. Origin of ores | |
| 4. Sand and gravel deposits | |

- 5. Ground water supplies
- J. Environmental hazards 2 hours
 - 1. Earthquakes
 - 2. Volcanic activity
 - 3. Floods
 - 4. Landslides
 - 5. Soil erosion
- K. Report Writing 2 hours
 - 1. Outline
 - 2. Text of report
 - 3. Diagram construction
 - 4. Use of photographs

V. Examination/Evaluation Procedures

Several field tests and a written final examination, including essay questions.

VI. Special Features

A proper field notebook and a term paper are required.

VII. Textbook

Field Geology, Frederick Lahee, current ed., McGraw

VIII. SLO

- 1. Students will gain an appreciation for how science works and difference between evidence and theory.
- 2. Students will be able to collect geologic data and interpret.
- 3. Students will be able to identify and interpret geologic features of the landscape they see on field trips for the course.