GROSSMONT COLLEGE

COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 04/26/2022

GCCCD Governing Board Approval: 06/14/2022

GEOL 162 - GEOLOGIC FIELD STUDIES: SOUTHERN CALIFORNIA MOUNTAIN AREAS

1. Course Number Course Title Semester Units

GEOL 162 Geologic Field Studies: Southern California Mountain Areas 1

Semester Hours:

1 hour lecture 16-18 total hours 32-36 outside-of-class hours 48-54 total hours

2. Course Prerequisites

None

Corequisite

None

Recommended Preparation

None

3. Catalog Description

This course involves lecture and field study of geologic processes and features in selected areas of the southern California mountains. Lectures will examine the regional geomorphic features, identify the specific rock types, and discuss the tectonic setting of the area to be visited, with emphasis on the overall geologic evolution of the area. Study areas will include, but are not limited to, various locations within the Peninsular Ranges and Transverse Ranges. Students are trained in various field study techniques such as map and cross-section development, identification of geologic specimens, and the use of geologic instruments. The course requires field trip travel, often including overnight camping and light to moderate hiking.

4. Course Objectives

The student will:

1. Recognize and describe the geologic features pertinent to mountains areas (i.e. igneous and metamorphic rock types, fold and fault structures, and intrusive relationships).
2. Relate the geology of the selected mountain range to regional geologic and tectonic settings.
3. Use geologic tools (i.e. hand lens, topographic and geologic maps, Brunton Compass, and Global Positional Systems (GPS)) to measure and analyze specific geologic features.
4. Assess geologic-related hazards associated with mountainous areas.
5. Evaluate the effect of human activities on natural processes.
6. Prepare sketches, maps, and field notes of observations and interpretations.
7. Synthesize information gathered during the field investigation into a written summary report or interpretational final exam responses.

5. Instructional Facilities

1. Standard classroom.
2. Field study area.

6. Special Materials Required of Student

1. Electronic storage media
2. Field notebook.
3. Access to minimal camping equipment to be used for the field trips.

7. Course Content

1. Identification of rock types, geologic structures, and landforms specific to mountain areas.
2. Relationship of area-specific rocks and processes to basic geologic concepts such as Bowen's reactions series and the rock cycle.
3. Background information on the tectonic setting of California's mountain areas.
4. General geology of the selected mountain study area with emphasis on understanding the geologic processes that shaped that area and its evolution through geologic time.
5. The effects of geologic hazards on humans and the effect that human activity has on the potential for geologic hazard.
6. Instruction in the use of various geologic tools such as topographic and geologic maps, a Brunton compass, and geologic cross-sections.

8. Method of Instruction

1. Lecture.
2. Group discussion.
3. Field study and observation.
4. Formative Assessments: measurement and analysis of key natural features.

9. Methods of Evaluating Student Performance

1. Essay questions and objective exams or quizzes, including final exam.
2. Field exercises specific to the geology and tectonic setting of mountainous regions.
3. Evaluation of field notebook.
4. Final project/presentation based on observations and data obtained in the field.
5. Homework Assignments

10. Outside Class Assignments

1. Pre-trip preparatory homework.
2. Reading current papers in scientific journals.

11. Representative Texts

a. Representative Text(s):

None

b. Supplementary texts and workbooks:

1) Appropriate papers, articles, and excerpts will be assigned for readings.

2) Sharp, R.P, and A.F. Glazner, *Geology Underfoot in Southern California*. Montana: Mountain Press Publishing Company, 1993.

3) Walawender, M.J., *The Peninsular Ranges: A Geologic Guide to San Diego's Back Country*. Kendall Hunt Publishing Company, Dubuque, IA, 2000.

Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

Students will be able to define, analyze, and synthesize geographic components within the designated field area.