GEOL A136: GEOLOGIC FIELD STUDIES - SAN ANDREAS FAULT

Item	Value
Curriculum Committee Approval Date	12/08/2021
Top Code	191400 - Geology
Units	1 Total Units
Hours	36 Total Hours (Lecture Hours 9; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

This course offers students an opportunity to explore fundamental geological concepts in a field-based setting. Pre-trip meetings will orient students to the tectonic, petrologic, historical and geomorphological setting of the San Andreas Fault Zone. This course includes a multi-day field excursion to various locales of geological interest and may involve camping in primitive wilderness environments. ADVISORY: GEOL A105, GEOL A105H, or GEOL A110. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Recognize and interpret fault geomorphology in the field.
2. Distinguish between different fault types and be able to identify fault types in the field.
3. Distinguish between the various types of folds and unconformities and be able to interpret their causes and significance.
4. Students will assemble a simple geological history for the region by gathering field observations and applying the scientific method.

Course Objectives

- 1. Describe the evolution of the San Andreas Fault.
- 2. Discuss the faulting style of Southern California.
- 3. Appreciate and express the importance of Wallace Creek in our current understanding of California tectonics.
- 4. Discuss and explain the basic geologic history of the field location, including the age relationships of the rocks, to any geologic structures, or other landforms
- 5. Identify, describe and evaluate faults as indicators of modern and past tectonic settings
- 6. Analyze and interpret geologic and topographic maps

Lecture Content

Cenozoic tectonics of California and origin of the San Andreas Fault Stress, strain and seismicity Restraining bends and compression Stream hydrology and offset channels Trip preparation and elementary field methods Geologic Processes Weathering and erosion processes Mechanical weathering processes Mass wasting Plate Tectonic History Current tectonic setting Past tectonic setting Structural Features (faults) and seismic history Hydrology and river processes

Lab Content

Identification and anlysis of the relative sequence of events from observable rock layers, faults, and other geologic landforms The laboratory portion of this course will include field excursions to sites throughout California and typify the topics covered in teh lecture portion of the course

Method(s) of Instruction

- Lecture (02)
- Lab (04)

Instructional Techniques

Instructor evaluation for the field notebook/journal content, which should include: explanaton of the natural history and basic geology of the area document field trip activities and exercises (data collection) written synopsis of geologic principles as they apply to the San Andreas Fault Instructor evaluation for in-field participation that demonstrates the student's ability to: analyze geologic processes in the field identify basic rocks and minerals analyze and interpret topographic and geologic maps collect field information and data by accurately using field equipment and instrumentation participate in discussion and cooperative group activities Independent Study

Reading Assignments

Students will spend approximately two hours per week on readings assigned from various journal articles and field trip guides will be provided to the students.

Writing Assignments

Students will spend approximately 2 hours per week utilizing written field notebook from trips, this will include lecture material and field observations. The students will be expected to maintain lecture and field notes and to write a concise, yet accurate, summary of the region upon returning from the field excursion.

Out-of-class Assignments

Students will spend approxiamtely two hours per week on homework including textbook exercises. Field trips will be given. This may include the generation of a field notebook based on field observations and lecture material. Sketches of the geologic structures within the rocks. Measurements of glacial striations for example.

Demonstration of Critical Thinking

Students will be expected to perform on the spot analysis of selected field sites to piece together the geological history of a region. Regular participation in class discussions and question and answer sessions is required. Examinations and quizzes will be given which are designed to determine the students comprehension of materials presented in class. Question types may include but are not limited to: essay and short answer, fill-in-the-blank, multiple choice, true and false, matching, draw-and-label the diagram questions and the reading and interpretation of geologic maps. Class and individual projects (as outlined above)

designed to help the students understand geological concepts will be collected for evaluation. The completeness and correctness of these assignments will provide a measure of the level of understanding each student has achieved and if the students are indeed moving toward the student learning outcomes.

Required Writing, Problem Solving, Skills Demonstration

Produce a written synopsis of geologic principles as they apply to the San Andreas Fault Computational or non-computational problem-solving demonstrations, including: homework problem(s) other (specify): map work based on landscape identification Written reports may be assigned which are designed to allow the students to explore specific geology topics in greater depth. Completion of the reports will expose students to a greater breadth of information and will demonstrate to the instructor whether or not the students are able to utilize the materials covered in class to gain a broader understanding of a topic explored on their own.

Eligible Disciplines

Earth science: Master's degree in geology, geophysics, earth sciences, meteorology, oceanography, or paleontology OR bachelor's degree in geology AND master's degree in geography, physics, or geochemistry OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Lynch, D. K.. The Field Guide to the San Andreas Fault, ed. Sunbelt Publications, 2015 2. Required Dvorak, J.. Earthquake Storms: The Fascinating History and Volatile Future of the San Andreas Fault, 1st ed. Pegasus, 2015 3. Required Collier, M.. A Land in Motion: California's San Andreas Fault, ed. University of California Press, 1999 Rationale: .