

# ESCI 0055A - WEEKEND FIELD GEOLOGY - EASTERN SIERRA

## Catalog Description

Hours: 18 lecture

Description: Weekend field trip to the eastern Sierra Nevada. A 1 hour and 50 minute pre-session will be held prior to the trip. Hiking may be necessary. Camping, entrance, and transportation fees may be required. (CSU)

## Course Student Learning Outcomes

- CSLO #1: Compare and contrast geologic features of specific field localities.
- CSLO #2: Analyze and evaluate geologic processes responsible for producing specific landforms of the area covered.
- CSLO #3: Interpret the tectonic setting of area covered.

## Effective Term

Fall 2018

## Course Type

Credit - Degree-applicable

## Contact Hours

18

## Outside of Class Hours

36

## Total Student Learning Hours

54

## Course Objectives

Through hands-on field experiences, discussion and assignments student will be able to:

1. Assess and describe rock lithologies and formations in the Eastern Sierra and Basin and Range geomorphological provinces.
2. Assess, describe, compare, and contrast geologic features in the Eastern Sierra and Basin and Range provinces.
3. Describe and evaluate the geologic history in the Eastern Sierra and Basin and Range provinces, from the Paleozoic Era through today.
4. Analyze and evaluate geologic processes and deduce valid conclusions as to the tectonic and erosional activity in the Eastern Sierra and Basin and Range provinces.
5. Synthesize geologic information to form conclusions, solve problems, and understand earth processes.
6. Create accurate written field notes.

## General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)

- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

## Articulation Information

- CSU Transferable

## Methods of Evaluation

- Classroom Discussions
  - Example: Students will discuss information relevant to each particular stop, for example, assessing the uplift of the Sierra Nevada during the last 15 million years.
- Reports
  - Example: Students will write research paper on a student-identified topic based on the trip. The research paper is graded both on content and writing ability and based on a rubric agreed upon by the faculty teaching the field courses. Examples of student paper topics include: Bodie, the town and the geology that created it, history of human settlement in the Mono Basin or Owens Valley, and geologic history of the Mono craters/domes.
- Other
  - Example: Students will create field notes including a clear description of the experience. Strong notes will be carefully written and present information in a road-log that includes mileage, turns, geology, photographs and/or drawings. This is graded based on a rubric agreed upon by the faculty teaching the field courses.

## Repeatable

No

## Methods of Instruction

- Lecture/Discussion

Lecture:

1. Instructor will lecture on the specific geologic history appropriate to Mesozoic emplacement of granitic plutons- the onset of subduction at the beginning of the Mesozoic and the cessation of subduction during the Cenozoic.
2. Instructor will lecture on the onset of the Basin and Range extension and the association fault structures and basaltic volcanism present.
3. Instructor will lecture on the events of the cataclysmic rhyolitic eruption and creation of the Long Valley Caldera approximately 760,000 years ago

## Typical Out of Class Assignments Reading Assignments

1. Read instructor-provided handouts pertaining to the Eastern Sierra and Basin and Range such as "Geologic Time Scale of the Sierra Nevada, Block diagram of Owens Valley and Adjacent Ranges and be prepared for discussion." 2. Read appropriate geological books and/or periodicals to prepare for research paper.

## Writing, Problem Solving or Performance

1. Using oral and written guidelines, create accurate field notes. 2. Complete a 2-4 page research paper based upon a topic identified by

the student and approved by the instructor, such as volcanic history of Mammoth Mountain.

## **Other (Term projects, research papers, portfolios, etc.)**

### **Required Materials**

- Geology of the Owens Valley and Inyo Mountains Region, California
  - Author: South Coast Geological Society
  - Publisher: South Coast Geological Society
  - Publication Date: 2001
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Deepest Valley: Guide to Owens Valley
  - Author: Genny Smith
  - Publisher: Genny Smith Books
  - Publication Date: 2014
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Eruptive history of Mammoth Mountain and its mafic periphery, California
  - Author: Wes Hildreth and Judy Fierstein
  - Publisher: U.S. Geological Survey, Reston, Virginia
  - Publication Date: 2016
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Eruptive History and Chemical Evolution of the Precaldera and Postcaldera Basalt-Dacite Sequences, Long Valley, California
  - Author: Roy A. Bailey
  - Publisher: U.S. Geological Survey, Reston, Virginia
  - Publication Date: 2004
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:

## **Other materials and-or supplies required of students that contribute to the cost of the course.**

Map of the Eastern Sierra and Basin and Range Supplemental library of the Eastern Sierra and Basin and Range Handouts Selected publications