

# ESCI 0056E - GEOLOGY OF THE CASCADE VOLCANOES

## Catalog Description

Hours: 36 lecture

Description: Exploration of the natural history of the volcanoes and mountains of the Cascade Range of western North America. May include national parks (eg. Lassen, Lava Beds, Crater Lake, Mount Saint Helens, Rainier). Some hiking required. Camping and/or park entrance fees may be required. A 2 hour and 50 minute classroom pre-session is required. (CSU)

## Course Student Learning Outcomes

- CSLO #1: Describe the active Andean Style plate boundary and how it relates to active volcanism and its hazards in the Pacific Northwest.
- CSLO #2: Explain the various styles of volcanism associated with both the Andean boundary and the Yellowstone Hotspot insertion into western North America.

## Effective Term

Fall 2018

## Course Type

Credit - Degree-applicable

## Contact Hours

36

## Outside of Class Hours

72

## Total Student Learning Hours

108

## Course Objectives

1. Relate rock types to the different formations of the Cascade Range.
2. Compare and contrast tectonic feature of the Cascade Range.
3. Interpret the geologic history of of the Cascade Range.
4. Analyze the geomorphic processes that sculpted the area, emphasizing active volcanism, river valleys, glacial erosion and fault features.
5. Relate the physical and biological environments of of the Cascade Range.

## 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

- Reports
  - Example: Students will create a report (4-6 pages) on a topic related to the geology or volcanology of the area of the field course.
- Other
  - Example: The student will create accurate and thorough field notes of the entire field experience to be turned in approximately 2 weeks after the trip.

## Repeatable

No

## Methods of Instruction

- Lecture/Discussion

Lecture:

1. The instructor will lecture on the geomorphic features, geomorphology, volcanic history and earthquake activity of selected Cascade volcanoes.
2. The instructor will lecture on the subduction zone tectonics of the Andean Type Plate Boundaries of the present day southern Cascade geologic province. Students are expected to actively engage in the discussion.

## Typical Out of Class Assignments

### Reading Assignments

1. Read handouts on basic geological settings, the geologic time scale, rock types and be prepared for discussion.
2. Read handouts on the Cascade Volcanoes and Andean Type Plate boundaries and be prepared for discussion.

## Writing, Problem Solving or Performance

1. Using oral and written guidelines, create accurate field notes.
2. Complete a 4-6 page research paper based on a topic identified by the student and approved by the instructor, such as a paper on the plate tectonics of the Cascade Range or the volcanic history of a dormant Cascade volcano.

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

### Required Materials

- Geology of the National Parks
  - Author: Ann G. Harris, Esther Tuttle, Sherwood D. Tuttle
  - Publisher: Kendal / Hunt
  - Publication Date: 2006
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Roadside Geology of Oregon
  - Author: Marli Miller
  - Publisher: Mountain Press
  - Publication Date: 2014

- Text Edition:
- Classic Textbook?:
- OER Link:
- OER:
- Roadside Geology of Washington
  - Author: Alt and Hynman
  - Publisher: Mountain Press
  - Publication Date: 1984
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Roadside Geology of the Northern and Central California
  - Author: Alt and Hynman
  - Publisher: Mountain Press
  - Publication Date: 2016
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Fire Mountains of the West
  - Author: Don Harris
  - Publisher: Mountain Press
  - Publication Date: 2005
  - Text Edition: 3rd
  - Classic Textbook?:
  - OER Link:
  - OER:

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