

# ESCI 0056A - FIELD GEOLOGY OF WESTERN NORTH AMERICA - DEATH VALLEY

## Catalog Description

Hours: 54 (27 lecture, 27 laboratory)

Description: One-week field experience to Death Valley and eastern Sierra Nevada. Emphasis placed on the geologic history of the area. We will be seeing rocks spanning over 1 billion years of earth history. A three-hour pre-session prior to the trip is required. 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

54

## Outside of Class Hours

54

## Total Student Learning Hours

108

## Course Objectives

1. Interpret the vast geologic history of Death Valley, starting with 1.8 billion year old rocks to present day salt flats.
2. Analyze the geomorphological processes that sculpted the area, emphasizing the onset of the Basin and Range extension and normal faulting- rise of the ranges, dropping of the basin.
3. Describe, compare, and contrast depositional and erosional glacial features.
4. Discuss of the Pleistocene climate and what we found in Death Valley- Lake Manly.
4. Discuss the Post Pleistocene climate change – high evaporation potential and internal drainages- salts.
5. Discuss the mining history of the Death Valley area.

## 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, building up of an alluvial fan by avulsion and using desert varnish as a dating tool.
- Reports
  - Example: Students will write a research paper (such as the formation of Death Valley's alluvial fans) 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.
- 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

- Laboratory
- Lecture/Discussion

Lab:

1. Instructor will stop at a site that illustrates a particular geologic structure and through discussion and perhaps diagram explain the geological process that created it. For example, we will be visiting the rock shore of Lake Manly, which occupied much of the basin that is now Death Valley during the Pleistocene.

Lecture:

1. Instructor will demonstrate relationships between geologic structures and the evolution of the landscape as we hike in Mosaic Canyon and drive through Titus Canyon. We will discuss the uplift of the ranges, the dropping of the basins and the wineglass canyons and alluvial fans created by periodic flash floods in the area.

## Typical Out of Class Assignments Reading Assignments

1. Read instructor-provided handouts pertaining to Death Valley and the surrounding areas such as "Geology of the Basin and Range" and be prepared to discuss.
2. Read appropriate geological books and/or periodicals to prepare for research paper, such as Cenozoic Rocks of the Amargosa Range.

## 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 history of Cenozoic volcanism west of the Sierra in California, the flora of Death Valley National Park, the fauna of Death Valley National Park, or special climatic conditions of the Death Valley region.

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

### **Required Materials**

- Geology of Death Valley: Landforms, Crustal Extension, Geologic History, Road Guides
  - Author: Miller Marli and Wright Lauren A
  - Publisher: Kendall Hunt Publishing
  - Publication Date: 2015
  - Text Edition: 3rd
  - Classic Textbook?:
  - OER Link:
  - OER:
- Geology Underfoot in Death Valley and Owens Valley
  - Author: Robert P. Sharp
  - Publisher: Mountain Press Publishing Company
  - Publication Date: 1997
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Road Guide to Death Valley National Park, Updated Edition
  - Author: Robert Decker and Barbara Decker
  - Publisher: Double Decker Press
  - 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 Death Valley and the surrounding areas  
Field instruction book prepared by instructor for Death Valley and the surrounding areas  
Supplemental library covering Death Valley and the surrounding areas  
Handouts  
Supplemental reading related to Death Valley and the surrounding areas