

# BIOL 0016I - BIOLOGY OF MONO LAKE AND THE GREAT BASIN

## Catalog Description

Hours: 26 (14 lecture, 12 laboratory)

Description: Field study investigating the natural history and ecology of the Great Basin with special emphasis on Mono Lake and the Mono Basin. Examines physical, biological, historical, and ecological aspects that make the Mono Basin unique. Emphasis on biological and ecological aspects of the Mono Basin. This class requires the ability to hike moderate distances on uneven ground. This class will involve camping in either developed campsites or in undeveloped wilderness areas. (CSU)

## Course Student Learning Outcomes

- CSLO #1: Describe and evaluate the impacts of humans on the ecosystems of Mono Lake and the Mono Basin.
- CSLO #2: Describe the ecological and geological principles that affect natural ecosystems of Mono Lake and the Mono Basin.
- CSLO #3: Explain the factors that have shaped the evolutionary adaptations of the organisms of Mono Lake and the Mono Basin.
- CSLO #4: Accurately document and interpret ecological observations made on a field trip to Mono Lake and the Mono Basin.

## Effective Term

Fall 2022

## Course Type

Credit - Degree-applicable

## Contact Hours

26

## Outside of Class Hours

28

## Total Student Learning Hours

54

## Course Objectives

Course objectives are linked to items in the course content outline (parentheses)

Lecture Objectives:

1. Evaluate the factors that have affected the formation of the ecosystems of Mono Lake and the Mono Basin. (Lecture Outline #1, #2, #5)
2. Apply ecological terminology to the description of the ecosystems of Mono Lake and the Mono Basin. (Lecture Outline #1, #2, #4, #5)
3. Investigate the interactions that local organisms have with the biotic and abiotic factors of their ecosystems. (Lecture Outline #1, #2, #3, #4, #5)

4. Explain the role that geology and hydrology plays in the formation and delineation of communities of Mono Lake and the Mono Basin. (Lecture Outline #3)

5. Analyze the past and present effects that humans have on Mono Lake and the Mono Basin. (Lecture Outline #6)

Laboratory Objectives:

1. Demonstrate the use of a taxonomic key or field guide to identify species. (Laboratory/Field Outline #1, #4)
2. Identify geological and hydrological features that impact the formation and function of communities of Mono Lake and the Mono Basin. (Laboratory/Field Outline #2, #3)
3. Investigate the interactions that local organisms have with the biotic and abiotic factors of their ecosystems. (Laboratory/Field Outline #1, #2, #3, #4)
4. Identify examples of human impacts on communities of Mono Lake and the Mono Basin. (Laboratory/Field Outline #4, #5)
5. Create a detailed field journal or summary report documenting the field experience. (Laboratory/Field Outline #6)

## 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

- Projects
  - Example: To address Course Lecture Objective #3, "Investigate the interactions that local organisms have with the biotic and abiotic factors of their ecosystems", students might be asked, either individually or in groups, to prepare a short oral presentation or written report or participate in a class discussion describing the major characteristics of a species of plant or animal occurring in Mono Lake or the Mono Basin and its role in the ecosystem. Students could be evaluated on participation, accuracy of information, attention to detail, and completeness.
- Reports
  - Example: To address Course Lab Objective #5, "Create a detailed field journal or summary report documenting the field experience", students might be asked to write a report summarizing the ecosystems visited, geological and hydrological features observed, and species encountered. Students could be evaluated based on accuracy of information, attention to detail, and completeness of summary.
- Skill Demonstrations
  - Example: To address Course Lab Objective #1, "Demonstrate the use of a taxonomic key or field guide to identify species", students might be asked to use a taxonomic key to correctly identify an organism. Students could be evaluated on the correctness of the answer, technique, and understanding of terminology in the key.

## Repeatable

No

## Methods of Instruction

- Laboratory
- Lecture/Discussion

### Lab:

1. To address Course Lab Objective #1, "Demonstrate the use of a taxonomic key or field guide to identify species", the instructor might lead the class in a demonstration of the use of a dichotomous key for a known specimen, and then guide students as they attempt the identification of an unknown specimen.
2. To address Course Lab Objective "2, "Identify geological and hydrological features that impact the formation and function of communities of Mono Lake and the Mono Basin", the instructor might point out such key features in the field, making comparisons to other such features observed in the field or described in the classroom. Students will then make and record their own observations and comparisons.

### Lecture:

1. To satisfy Course Lecture Objective #4, "Explain the role that geology plays in the formation and delineation of communities of Mono Lake and the Mono Basin", the instructor might present a lecture (supplemented by images and/or video) that explains the geological history of the Mono Basin, including formation of the Sierra Nevada, the Ice Age, and volcanism, and how those have influenced the development of soils and species assemblages. Students will then make and record their own observations of geological features.
2. To satisfy Course Lecture Objective #5, "Analyze the past and present effects that humans have on Mono Lake and the Mono Basin", the instructor might lead an in-class discussion about the historical impacts of humans on Mono Lake and the Mono Basin (e.g. mining, fishing, water export, recreation, etc.).

## Typical Out of Class Assignments

### Reading Assignments

1. To address Course Lecture Objective #2, students might be asked to read a handout that describes basic ecological terminology or to read the Ecology unit from the OpenStax Biology online textbook and then apply this knowledge to descriptions of observations made in the field.
2. To address Course Lecture Objective #3 and Course Lab Objective #3, students might be asked to review life history information for a Mono Lake or Mono Basin species that is available in a field guide, handout, or a natural resource agency website and be prepared to discuss this in class.

## Writing, Problem Solving or Performance

1. To address Course Lecture Objective #4 and Course Lab Objective #2, students might be asked to write and/or prepare a short oral presentation about a geologic or hydrologic feature occurring at Mono Lake or the Mono Basin. 2. To address Course Lab Objective #5, students might be asked to document their observations in the field in a journal, using any combination of text, sketches, photos, and/or other media.

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

### Required Materials

- California's Changing Landscapes: Diversity and Conservation of California Vegetation
  - Author: Michael Barbour, et al.
  - Publisher: California Native Plant Society
  - Publication Date: 1991
  - Text Edition: 1st
  - Classic Textbook?:
  - OER Link:
  - OER:
- Plant Communities of the Mono Basin
  - Author: Helen Constantine
  - Publisher: Kutsavi Press
  - Publication Date: 1993
  - Text Edition: 1st
  - Classic Textbook?:
  - OER Link:
  - OER:
- Sierra East: Edge of the Great Basin
  - Author: Genny Smith, et al.
  - Publisher: UC Press
  - Publication Date: 2003
  - Text Edition: 2nd
  - Classic Textbook?:
  - OER Link:
  - OER:
- The Laws Guide to Nature Drawing and Journaling
  - Author: Laws, John Muir
  - Publisher: Heyday Books
  - Publication Date: 2016
  - Text Edition: 1st
  - Classic Textbook?:
  - OER Link:
  - OER:
- Mono Lake: From Dead Sea to Environmental Treasure
  - Author: Hoffman, Abraham
  - Publisher: University of New Mexico Press
  - Publication Date: 2014
  - Text Edition: 1st
  - Classic Textbook?:
  - OER Link:
  - OER:

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