

BIOL 0016Q - ECOLOGY OF MID-WESTERN NORTH AMERICA

Catalog Description

Hours: 54 (27 lecture, 27 laboratory)

Description: Field introduction to ecology of the major biomes, communities and life zones of the Midwestern and Western regions of the United States, emphasizing plains grasslands, montane forests, desert badlands, alpine zones, and aquatic habitats. Topics explored in each ecological area include climate, common plants and animals, species relationships, geology, historical changes, paleoecology and other environmental factors. Fossil and other evidence of past environments compared to present communities. 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 environments of the Midwestern and Western regions of the United States.
- CSLO #2: Describe the ecological and geological principles that affect the natural ecosystems of the Midwestern and Western regions of the United States.
- CSLO #3: Explain the factors that have shaped the evolutionary adaptations of the organisms of the Midwestern and Western regions of the United States.
- CSLO #4: Accurately document and interpret ecological observations made on a field trip to the Midwestern and Western regions of the United States.

Effective Term

Fall 2022

Course Type

Credit - Degree-applicable

Contact Hours

54

Outside of Class Hours

54

Total Student Learning Hours

108

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 Midwestern and Western regions of the United States. (Lecture Outline #1, #2, #5)

2. Apply ecological terminology to the description of the ecosystems of Midwestern and Western regions of the United States. (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 plays in the formation and delineation of communities of Midwestern and Western regions of the United States. (Lecture Outline #3)

5. Analyze the past and present effects that humans have on ecosystems of Midwestern and Western regions of the United States. (Lecture Outline #6)

Laboratory Objectives:

1. Demonstrate the use of a taxonomic key or field guide to identify species. (Laboratory/Field Outline #1)

2. Identify geological and hydrological features that impact the formation and function of communities in Midwestern and Western regions of the United States. (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. Identify examples of human impacts on communities of Midwestern and Western regions of the United States. (Laboratory/Field Outline #5)

5. Create a detailed field journal or summary report documenting the field experience. (Laboratory/Field Outline #6)

6. Formulate reconstructions of past environments from evidence and information gathered during field work (Laboratory/Field Outline #1, #2, #4)

7. Identify the proper procedures for extraction, preparation and preservation of fossil materials discovered in the field (Laboratory/Field Outline #4)

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: To address Course Lecture Objective #3, "Investigate the interactions that local organisms have with the biotic and abiotic factors of their ecosystems", students might take part in a classroom discussion about the major characteristics of representative species of plants and animals occurring in the Midwestern or Western regions of the United States and their role in the ecosystem. Students could be evaluated based on participation, accuracy of information, and completeness of information.
- 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 complete a project, either individually or in groups, that includes researching the major characteristics of a species of plant or animal occurring in the Midwestern or Western regions of the United States and its role in the ecosystem, compiling this information in

written or graphical form, and sharing this information in an oral classroom presentation. Students could be evaluated based on the completeness of the project, participation in all aspects of the project, accuracy of information presented, and overall quality of the project.

- 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 in Midwestern and Western regions of the United States", 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 Midwestern and Western regions of the United States.", the instructor might present a lecture (supplemented by images and/or video) that explains the geological history of the regions (e.g. geologic uplift, tectonic plate movements, ice ages, etc.) and how it has 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 ecosystems of Midwestern and Western regions of the United States", the instructor might lead an in-class discussion about the historical impacts of humans on the region (e.g. mining, water use, agriculture, forest management, 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 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 species occurring in the Midwestern or Western region of the United States 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 in a Midwestern or Western region of the United States. 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

- Essentials of Landscape Ecology
 - Author: With
 - Publisher: Oxford University Press
 - Publication Date: 2019
 - Text Edition: 1st
 - Classic Textbook?:
 - OER Link:
 - OER:
- Fossil Ecosystems of North America: A Guide to the Sites and Their Extraordinary Biotas
 - Author: John R. Nudds and Paul A. Selden
 - Publisher: University Of Chicago Press
 - Publication Date: 2008
 - Text Edition: 1st
 - 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:

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