

# BIOL M06: ECOLOGY

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**Originator**

swilcox

**Co-Contributor(s)**
**Name(s)**

Johnson, Jana (jjohnson)

**College**

Moorpark College

**Attach Support Documentation (as needed)**

Fullerton College Ecology.pdf  
 SMC BIOL 10 Ecology.pdf  
 Mt San Antonio Ecology.pdf

**Discipline (CB01A)**

BIOL - Biology

**Course Number (CB01B)**

M06

**Course Title (CB02)**

Ecology

**Banner/Short Title**

Ecology

**Credit Type**

Credit

**Honors**

No

**Start Term**

Fall 2024

**Catalog Course Description**

Examines the abiotic and biotic interactions between organisms and their environment. Covers the unifying theory of evolution by natural selection, population genetics, and diversification of life on earth. Considers adaptations as they tie to the environment, especially temperature, water, energy, nutrient and social relations. Evaluates population growth, dynamics, distribution and abundance that impact community interactions (predation, mutualism & competition). Includes nutrient cycling and trophic structure. Focuses these investigations relative to ecosystems, behavioral ecology, population & community ecology the course will conclude with large-scale, global ecology and conservation principles.

**Taxonomy of Programs (TOP) Code (CB03)**

0401.00 - Biology, General

**Course Credit Status (CB04)**

D (Credit - Degree Applicable)

**Course Transfer Status (CB05) (select one only)**

A (Transferable to both UC and CSU)

**Course Basic Skills Status (CB08)**

N - The Course is Not a Basic Skills Course

**SAM Priority Code (CB09)**

E - Non-Occupational

**Course Cooperative Work Experience Education Status (CB10)**

N - Is Not Part of a Cooperative Work Experience Education Program

**Course Classification Status (CB11)**

Y - Credit Course

**Educational Assistance Class Instruction (Approved Special Class) (CB13)**

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

Will be required

**Faculty notes on field trips; include possible destinations or other pertinent information**

Potential field trips include: Palos Verdes Blue Butterfly release sites; Recent burned sites in Simi Valley and/or surrounding areas; Arroyo Simi Bike Path (Creek/Stream ecology); Bolsa Chica Wetlands; Antelope Valley California Poppy Reserve.

**Grading method**

(L) Letter Graded

**Alternate grading methods**

(O) Student Option- Letter/Pass

(P) Pass/No Pass Grading

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Minimum Contact/In-Class Lecture Hours**

52.5

**Maximum Contact/In-Class Lecture Hours**

52.5

**Activity****Laboratory****Minimum Contact/In-Class Laboratory Hours**

52.5

**Maximum Contact/In-Class Laboratory Hours**

52.5

**Total in-Class****Total in-Class****Total Minimum Contact/In-Class Hours**

105

**Total Maximum Contact/In-Class Hours**

105

**Outside-of-Class****Internship/Cooperative Work Experience****Paid****Unpaid****Total Outside-of-Class****Total Outside-of-Class****Minimum Outside-of-Class Hours**

105

**Maximum Outside-of-Class Hours**

105

**Total Student Learning****Total Student Learning****Total Minimum Student Learning Hours**

210

**Total Maximum Student Learning Hours**

210

**Minimum Units (CB07)**

4

**Maximum Units (CB06)**

4

**Student Learning Outcomes (CSLOs)****Upon satisfactory completion of the course, students will be able to:**

- |   |  |
|---|--|
| 1 | give examples of how humans positively and negatively impact the environment               |
| 2 | demonstrate knowledge of the ecological and evolutionary connectedness of living organisms |

**Course Objectives****Upon satisfactory completion of the course, students will be able to:**

- |   |   |
|---|---|
| 1 | explain the essential elements of life, major hypotheses for life's history, and mechanisms for the diversification of life on Earth. |
|---|---|

- 2 develop an appreciation for the natural world through direct observation of local ecosystems.
- 3 explore ecological concepts that link individuals at population, community, biome, and ecosystem levels.
- 4 evaluate the relationships of organisms to each other and their specific environments.
- 5 apply the processes of scientific inquiry, phylogenetic analysis, and experimental design to the ecology of organisms.
- 6 demonstrate techniques of data collection, analysis, and methods of presenting scientific information in figures and tables.

## Course Content

### Lecture/Course Content

#### 15.00% Natural History and Evolution:

Life on Land

Life in Water

Population Genetics and Natural History

#### 15.00% Adaptations to the Environment

Temperature Relations

Water Relations

Energy and Nutrient Relations

Social Relations

#### 20.00% Population Ecology

Population Distribution and Abundance

Population Dynamics

Population Growth

Life Histories

#### 15.00% Interactions

Species Interactions and Competition

Exploitative Interactions: predation, herbivory, parasitism, and disease

Mutualism

#### 20.00% Communities and Ecosystems

Species Abundance and Diversity

Species Interactions and Community Structure

Primary and Secondary Production

Nutrient Cycling and Retention

Succession and Stability

#### 15.00% Large-scale Ecology

Landscape Ecology

Geographic Ecology

Global Ecology

### Laboratory or Activity Content

6.00% Nature of Data and Process of Science

6.00% Soil Analysis

6.00% Population Growth

6.00% Age Distribution and Survivorship

6.00% Terrestrial Plant Community Assessment

6.00% Stream Ecosystem Assessment

6.00% Microcommunity Assessment

6.00% Sampling a Plant Community

6.00% Sampling Animal Communities

6.00% Species Diversity

6.00% Primary Productivity in Communities

6.00% Competition

6.00% Natural Selection

6.00% Adaptations of Vertebrates to Their Environments

6.00% Adaptations of Plants to Their Environments

10.00% Field Study - Ecology Project

## Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Written expression  
 Problem solving exercises  
 Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Essay exams  
 Group projects  
 Individual projects  
 Laboratory activities  
 Laboratory practical examinations  
 Laboratory reports  
 Objective exams  
 Oral presentations  
 Problem-solving exams  
 Skills demonstrations

## Instructional Methodology

Specify the methods of instruction that may be employed in this course

Audio-visual presentations  
 Case studies  
 Class activities  
 Class discussions  
 Collaborative group work  
 Distance Education  
 Field experience/non-internship  
 Field trips  
 Group discussions  
 Guest speakers  
 Instructor-guided interpretation and analysis  
 Instructor-guided use of technology  
 Laboratory activities  
 Large group activities  
 Lecture  
 Observation  
 Problem-solving examples  
 Small group activities

Describe specific examples of the methods the instructor will use:

- Audio-visual presentations and lecture.
- Computer-aided presentations by the instructor and the students.
- Laboratory activities to illustrate and train students on proper ecological methodology in the lab.
- Field activities to train students on ecological data collection.
- Class discussions generated by student presentations of ecological primary literature.

## Representative Course Assignments

### Writing Assignments

laboratory reports.  
 term projects on current ecological issues.

### Critical Thinking Assignments

evaluate the relationships of organisms to each other and their environments.  
 examine the impact of climatic features such as rainfall, fire, and climate patterns on organisms.  
 identify types of native and non-native plants and animals of California.

### Reading Assignments

read a primary literature article on population, community, or ecosystem ecology.

read relevant sections in the Ecology lab manual.

read relevant chapters in the Ecology textbook.

### Skills Demonstrations

assess various sampling methods for plants and animals.

interpret plant and animal diversity data.

### Problem-Solving and Other Assignments (if applicable)

interpret graphical representations of ecological data.

generate testable hypotheses for ecological observations and patterns.

## Outside Assignments

### Representative Outside Assignments

locate primary literature on current concerns regarding local and global ecological issues.

participate in field trips to study a local ecosystem.

conduct research on various ecosystems.

## Articulation

### Equivalent Courses at 4 year institutions

University	Course ID	Course Title	Units
CSU Bakersfield	BIOL 1039	Principles of Ecology	3
UC Davis	eve 011	Principles of Ecology	4
UC Irvine	BIO SCI 55	Introduction to Ecology	4
UC Santa Cruz	ENVS 24	General Ecology	5

### Comparable Courses within the VCCCD

BIOL R198C - Introduction to Ecology

BIOL V03 - Evolution, Ecology, and Organismal Biology

### Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
Santa Monica College	BIOL 10	Applied Ecology and Conservation Biology	4
Mt. San Antonio College	BIOL 3	Ecology and Field Biology	4
Fullerton College	BIOL 274	General Ecology	4

## District General Education

### A. Natural Sciences

#### A1. Biological Science

Proposed

#### Effective term:

Fall 2024

**B. Social and Behavioral Sciences****C. Humanities****D. Language and Rationality****E. Health and Physical Education/Kinesiology****F. Ethnic Studies/Gender Studies**

Course is CSU transferable

Yes

CSU Baccalaureate List effective term:

Fall 2024

**CSU GE-Breadth****Area A: English Language Communication and Critical Thinking****Area B: Scientific Inquiry and Quantitative Reasoning****B2 Life Science**

Proposed

Date Proposed:

12/15/2023

**B3 Laboratory Activity**

Proposed

Date Proposed:

12/15/2023

**Area C: Arts and Humanities****Area D: Social Sciences****Area E: Lifelong Learning and Self-Development****Area F: Ethnic Studies****CSU Graduation Requirement in U.S. History, Constitution and American Ideals:****UC TCA**

UC TCA

Proposed

Date Proposed:

6/15/2023

## IGETC

### Area 1: English Communication

### Area 2A: Mathematical Concepts & Quantitative Reasoning

### Area 3: Arts and Humanities

### Area 4: Social and Behavioral Sciences

### Area 5: Physical and Biological Sciences

#### Area 5B: Biological Science

Proposed

#### Date Proposed:

12/15/2023

#### Area 5C: Laboratory Science

Proposed

#### Date Proposed:

12/15/2023

### Area 6: Languages Other than English (LOTE)

## Textbooks and Lab Manuals

### Resource Type

Textbook

### Classic Textbook

Yes

### Description

Sher, Anna and Manuel Molles. *Ecology: Concepts and Applications*. 9th ed., McGraw Hill, 2021.

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### Resource Type

Manual

### Description

Smeins, Fred E., Ben Wu and Richard D. Slack. *Fundamentals of Ecology Laboratory Manual*. 4<sup>th</sup> ed., Kendall Hall Publishing, 2017.

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### Resource Type

Manual

### Description

Begon, Michael and Colin R. Townsend. *Ecology: From Individuals to Ecosystems*. 5<sup>th</sup> ed., Wiley, 2021.

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### Resource Type

Manual

### Description

Wheater, C. Philip, et al. *Practical Field Ecology: A Project Guide*. 2<sup>nd</sup> ed., Wiley, 2020.

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## Library Resources

### Assignments requiring library resources

Utilize the Library's print and online resources in preparation for writing research papers on such topics as population, community, or ecosystem ecology.

### Sufficient Library Resources exist

No

### Example of Assignments Requiring Library Resources

Utilize library resources to locate primary literature on current concerns regarding local and global ecological issues.

## Distance Education Addendum

### Definitions

#### Distance Education Modalities

Hybrid (1%–50% online)  
Hybrid (51%–99% online)  
100% online

### Faculty Certifications

**Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.**

Yes

**Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.**

Yes

### Regular Effective/Substantive Contact

#### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> <li>o Recorded Lectures, Narrated Slides, Screencasts</li> <li>o Instructor created content</li> <li>o MC Online Library Resources</li> <li>o Canvas Student Groups (Assignments, Discussions)</li> <li>o Websites and Blogs</li> <li>o Multimedia (YouTube, Films on Demand, 3CMedia, Khan Academy, etc.).</li> </ul>

**Hybrid (51%–99% online) Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> <li>o Recorded Lectures, Narrated Slides, Screencasts</li> <li>o Instructor created content</li> <li>o MC Online Library Resources</li> <li>o Canvas Student Groups (Assignments, Discussions)</li> <li>o Websites and Blogs</li> <li>o Multimedia (YouTube, Films on Demand, 3CMedia, Khan Academy, etc.).</li> </ul>

**100% online Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> <li>o Recorded Lectures, Narrated Slides, Screencasts</li> <li>o Instructor created content</li> <li>o MC Online Library Resources</li> <li>o Canvas Student Groups (Assignments, Discussions)</li> <li>o Websites and Blogs</li> <li>o Multimedia (YouTube, Films on Demand, 3CMedia, Khan Academy, etc.).</li> </ul>

**Examinations****Hybrid (1%–50% online) Modality**

On campus  
Online

**Hybrid (51%–99% online) Modality**

On campus  
Online

**Primary Minimum Qualification**

BIOLOGICAL SCIENCES

**Review and Approval Dates****Department Chair**

11/13/2022

**Dean**

11/21/2022

**Technical Review**

12/01/2022

**Curriculum Committee**

12/6/2022

**DTRW-I**

01/12/2023

**Curriculum Committee**

MM/DD/YYYY

**Board**

02/14/2023

**CCCCO**

MM/DD/YYYY

**DOE/accreditation approval date**

MM/DD/YYYY