

# ENVIRONMENTAL STUDIES AND SUSTAINABILITY

## Contact Information

**Division**  
Sciences and Mathematics

**Dean**  
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## Overview

The Environmental Studies and Sustainability program at Sierra College provides students with the opportunity to meet the requirements to transfer to four-year colleges in the environmental fields including Environmental Studies and Environmental Science. The program provides students with a common interdisciplinary base with which to address issues of environmental health, sustainability and global stewardship. Students will have the opportunity to apply principles from a range of fields including the physical and life sciences, social sciences and philosophy, as well as technical skills utilized in ecosystem assessment and the expanding field of solar energy.

## Faculty

**Kristine D. Gilbert**  
**Professor, Environmental Studies and Sustainability**  
B.A., University of California, Davis  
M.S., California State University, Chico

## Degrees/Certificates

### Environmental Studies and Sustainability

#### AS Degree

Successful completion of the Environmental Studies and Sustainability curriculum will prepare students for transfer to four-year colleges or universities. The major has been designed to meet lower-division requirements for Environmental Studies and Environmental Science majors at transfer institutions. In all cases, students should consult with a counselor for more information on university admission and transfer requirements. Students must fulfill the following major requirements with grades of "C" or better, complete a minimum of 60 degree-applicable semester units (12 of which must be completed at Sierra College) with a grade point average of at least 2.0 and complete one of the following three general education patterns:

- Sierra College Associate Degree Requirements (<http://catalog.sierracollege.edu/archive/2019-2020/student-resources/general-education/associate-degree-requirements>);
- California State University General Education Breadth (<http://catalog.sierracollege.edu/archive/2019-2020/student-resources/general-education/california-state-university-general-education-breadth-requirements>) pattern;
- Intersegmental General Education Transfer Curriculum (IGETC) (<http://catalog.sierracollege.edu/archive/2019-2020/student-resources/general-education/intersegmental-general-education-transfer-curriculum-igetc>).

resources/general-education/intersegmental-general-education-transfer-curriculum-igetc).

#### Required Courses

Code	Title	Units
BIOL 0001	General Biology	4
BIOL 0002	Botany	4.5
BIOL 0003	General Zoology	4.5
CHEM 0001A or CHEM 0003A & CHEM 0003B	General Chemistry I and General Chemistry I - Part 2	5-6
ESCI 0001 or GEOG 0001	Physical Geology Physical Geography	3
ESS 0001	The Environment and the Human Impact	3

#### Select 4-6 units from the following:

AGRI 0198	Food, Society and the Environment	4-6
AGRI 0221	Introduction to Soil Science	
ANTH 0002	Cultural Anthropology	
ANTH 0014	Global Problems	
BIOL 0013	Field Methods in Ecology	
BIOL 0014	Natural History, Ecology and Conservation (also ESS 0014)	
BIOL 0016A	Local Ecosystems of Placer County <sup>1</sup>	
BIOL 0016B	Local Ecosystems of Nevada County <sup>1</sup>	
BIOL 0016C	Vernal Pools and the California Prairie <sup>1</sup>	
BIOL 0016D	Biology of Waterfowl and Marsh Birds <sup>1</sup>	
BIOL 0016E	Ecology of the Sierran Conifer Forest <sup>1</sup>	
BIOL 0016G	Weekend Field Paleontology and Ancient Environments (also ESCI 0016G) <sup>1</sup>	
BIOL 0016H	Ecology of the Mendocino Coast <sup>1</sup>	
BIOL 0016I	Biology of Mono Lake and the Great Basin <sup>1</sup>	
BIOL 0016J	Ecology of Point Reyes National Seashore <sup>1</sup>	
BIOL 0016K	Foothill Ecology of the Sierra Nevada <sup>1</sup>	
BIOL 0016L	Aquatic and Riparian Environments of California Waterways <sup>1</sup>	
BIOL 0016M	Marine Mammals and Birds <sup>1</sup>	
BIOL 0016N	Ecology of the Modoc Plateau <sup>1</sup>	
BIOL 0016O	Ecology of the High Sierra and White Mountain <sup>1</sup>	
BIOL 0016P	Death Valley and Desert Ecosystems <sup>1</sup>	
BIOL 0016Q	Ecology of Mid-Western North America <sup>1</sup>	
BIOL 0016R	Canyon Lands of the Southwest <sup>1</sup>	
BIOL 0016T	Coastal Habitats of Northern California <sup>1</sup>	
BIOL 0016U	Coastal Habitats of Central California <sup>1</sup>	
BIOL 0016V	Deserts of Southern California <sup>1</sup>	
BIOL 0016W	Biology/Ecology of the Klamath and the Southern Cascade <sup>1</sup>	
BIOL 0016Y	Ecology of Selected Wilderness Ecosystems <sup>1</sup>	

BIOL 0016Z	Ecology of the American River <sup>1</sup>
BIOL 0017B	Ecology of the Sutter Buttes <sup>1</sup>
BIOL 0023	Wildflower Identification
BIOL 0024	Wildland Trees and Shrubs (Dendrology)
CET 0040	Beginning Photovoltaic Systems
ECON 0001A	Principles of Macroeconomics
or ECON 0001B	Principles of Microeconomics
ESCI 0001L	Physical Geology Laboratory
ESCI 0010	Introduction to Earth Science
ESCI 0054A	Sierra Nevada and Western Basin and Range Provinces <sup>1</sup>
ESCI 0054B	Great Valley and Coast Range Provinces <sup>1</sup>
ESCI 0054C	Great Valley, Coast Ranges, and Sutter Buttes <sup>1</sup>
ESCI 0054D	Western Sierra Nevada and the Mother Lode <sup>1</sup>
ESCI 0054E	Major Rock Units of the Northern Sierra <sup>1</sup>
ESCI 0055C	Weekend Field Geology - Point Reyes <sup>1</sup>
ESCI 0055F	Weekend Field Geology <sup>1</sup>
ESS 0001L	Introduction to Environmental Science Laboratory
ESS 0006	The Sierra Nevada
ESS 0006F	Sierra Nevada Field Trip
ESS 0007	Energy, Environment, and Climate (also ESCI 0007)
ESS 0008	California Water
ESS 0010	Conservation of Natural Resources
ESS 0013	Environmental Regulations
GEOG 0001	Physical Geography
GEOG 0001L	Physical Geography Laboratory
GEOG 0002	Cultural Geography
GEOG 0090	Introduction to Geographic Information Systems (GIS)
GEOG 0091A	Beginning Arc GIS
GEOG 0091B	Intermediate Arc GIS
MATH 0013	Elementary Statistics
PHIL 0060	Introduction to Environmental Ethics
PSYC 0170	Environmental Psychology
Total Units	28-31

<sup>1</sup> A maximum of 3 units may be taken from the BIOL 0016, BIOL 0017, BIOL 0023 and ESCI 0016, 0054 and 0055 field studies courses.

## Courses

Understanding course descriptions (<http://catalog.sierracollege.edu/archive/2019-2020/student-resources/course-information/understanding-course-descriptions>)

### ESS 0001. The Environment and the Human Impact

*Units:* 3

Formerly known as INT 1

Advisory: Eligibility for ENGL 1A

Hours: 54 lecture

Theoretical and practical understanding of the principles of ecology, the complexities of technology, and the contemporary problems of the environment on both a local and global level. Lecture/discussion and films in the areas of population, technology, environmental restoration, land use, energy, pollution, and world hunger, as well as the basic concepts, economics, politics, poetry, literature, and philosophy of ecology. (CSU, UC)

### ESS 0001L. Introduction to Environmental Science Laboratory

*Unit:* 1

Prerequisite: Completion with grade of "C" or better or concurrent enrollment in ESS 1

Hours: 54 laboratory

Hands-on, inquiry-based learning in topics associated with environmental science. Laboratory and field studies including applications of physical science principles, ecological studies, and exposure to sustainability issues related to human society. Promotes critical thinking, problem solving, scientific and environmental literacy. May include field trip(s) during or in lieu of lab time. Students may be required to provide their own transportation. (CSU, UC)

### ESS 0006. The Sierra Nevada

*Units:* 3

Formerly known as INT 6

Advisory: Eligibility for ENGL 1A

Hours: 54 lecture

Integrated study of the Sierra Nevada including its physical attributes, geological characteristics, origin and development, flora and fauna, water resources, historical and economic significance, and influences on literature, art, and culture. Includes contemporary environmental, economic, and management issues in the Sierra. (CSU, UC)

### ESS 0006F. Sierra Nevada Field Trip

*Units:* 0.5-1

Prerequisite: Completion with grade of "C" or better, or concurrent enrollment in ESS 6

Hours: 18 lecture per unit

Field lecture course designed to be taken concurrently with ESS 6. A field study of selected sites in the Sierra Nevada ecoregion, comparing their biological inventory, ecological relationships, physical environments, and sensitivity to human interactions and activities. Moderate hiking may be involved. Entrance and transportation fees may be required. Students may be required to provide their own transportation. (CSU)

### ESS 0007. Energy, Environment, and Climate

*Units:* 3

Also known as ESCI 7

Advisory: Eligibility for ENGL 1A

Hours: 54 lecture

Analysis of the nature of energy and the environmental impact of its societal use in the context of Earth's record of changing climate. Explores current global climate change due to post-1750 greenhouse gas emissions and strategies for mitigation and adaptation to changing climate predictions, emphasizing future alternative energy sources. Designed for students majoring in areas related to the environmental sciences and/or those interested in developing a substantiated understanding of the role played by citizens in ensuring a healthy environment for future generations. (CSU, UC)

**ESS 0008. California Water***Units: 4*

Hours: 108 (54 lecture, 54 laboratory)

Interdisciplinary examination of California water ecosystems, infrastructure, uses, and impacts. Students will learn about: hydrology; aquatic ecosystems including rivers, lakes, wetlands, estuaries, and marine environments; water infrastructure including dams, levees, aqueducts, and wastewater treatment facilities; groundwater recharge, withdrawal, use and impacts; the role of water in agricultural, urban, environmental and political systems; water quality; water storage and transfers; water policy; and conflicts arising from water scarcity. May include field trips during or in lieu of lab time. Students may be required to provide their own transportation. (CSU)

**ESS 0010. Conservation of Natural Resources***Units: 3*

Formerly known as AGRI 190 and NATR 10

Advisory: Eligibility for ENGL 1A

Hours: 54 lecture

Use and protection of natural resources, including soil, water, forest, mineral, plant, and animal life. Ecological principles, history of the conservation movement, modern problems in resource use, and the citizen's role in conservation. (CSU, UC)

**ESS 0013. Environmental Regulations***Unit: 1*

Formerly known as BIOL 13A

Advisory: Completion of BIOL 14 or ESS 10 with grade of "C" or better

Hours: 18 lecture

Survey of major California environmental regulations and relevant federal regulations. Designed using case study analyses to explore environmental laws applicable to water, land and air resources. (CSU)

**ESS 0014. Natural History, Ecology and Conservation***Units: 4*

Also known as BIOL 14

Advisory: Eligibility for ENGL 1A

Hours: 108 (54 lecture, 54 laboratory)

Introduction to the study of biology and ecology of organisms and ecosystems of the world, with an emphasis on California. Special focus on significance of functioning ecosystems and human influence on biological environment. (CSU, UC)

**ESS 0028. Independent Study***Units: 1-3*

Designed for students interested in furthering their knowledge at an independent study level in an area where no specific curriculum offering is currently available. Independent study might include, but is not limited to, research papers, special subject area projects, and research projects. See Independent Study page in catalog. (CSU, UC-with unit limitation)

**ESS 0095. Internship in Environmental Studies and Sustainability***Units: 0.5-4*

Designed for advanced students to work in an area related to their educational or occupational goal. Provides new on-the-job technical training under the direction of a worksite supervisor, allowing students to expand knowledge and skills in the chosen field. Mandatory orientation session and faculty approval to determine eligibility. Students may earn up to a total of 16 units in internship courses (any course numbered 95 and PDEV 94). (CSU-with unit limitation)

## Program Student Learning Outcomes (PSLOs)

- Identify and describe the essential components of earth's natural environment - its physical, biological, energy-related, and ecological elements.
- Describe and analyze core environmental problems, their causes and consequences, and practical solutions.
- Apply the conservation of matter and energy to environmental systems.
- Investigate the role of governmental policy, citizen involvement, and/or ethics/values/morals in influencing human interaction with the environment.
- Evaluate and apply principles of sustainability to human activity on earth.