

ENSC M01: ENVIRONMENTAL SCIENCE

Originator

bswartz

Co-Contributor(s)
Name(s)

Putnam, Roger (rputnam)

College

Moorpark College

Discipline (CB01A)

ENSC - Environmental Science

Course Number (CB01B)

M01

Course Title (CB02)

Environmental Science

Banner/Short Title

Environmental Science

Credit Type

Credit

Start Term

Fall 2022

Catalog Course Description

Examines the ways in which Earth operates. Includes understanding the mechanics of living and physical processes in biology, chemistry, physics, and the earth sciences. Emphasizes the relationship between humans and their environment, and the impact of technology on the global environment. Surveys energy, air, water, soil pollution, and conservation, and present sustainable solutions to these practices.

Taxonomy of Programs (TOP) Code (CB03)

0301.00 - Environmental Science

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

May be required

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

Rancho Sierra Vista/Satwiwa, Simi Valley Landfill and Recycling Center, Hill Canyon Wastewater Treatment Plant, Ventura River Estuary, other local destinations (outdoors or facilities) that profile human activity at the intersection of the earth, water, life, and nature.

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

Total in-Class

Total in-Class

Total Minimum Contact/In-Class Hours

52.5

Total Maximum Contact/In-Class Hours

52.5

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

157.5

Total Maximum Student Learning Hours

157.5

Minimum Units (CB07)

3

Maximum Units (CB06)

3

Student Learning Outcomes (CSLOs)

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

- | | |
|---|--|
| 1 | relate the history and impacts of unsustainable practices and discuss modern policy or societal changes that have introduced sustainable alternatives. |
|---|--|

Course Objectives

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

- | | |
|---|---|
| 1 | define the concept of sustainability and evaluate how sustainable various processes are based on that definition. |
| 2 | reproduce the equations for photosynthesis and cellular respiration; explain how the laws of thermodynamics apply to the role of energy production. |
| 3 | diagram the cycling of water and chemical elements (e.g., carbon or nitrogen) through the atmosphere, lithosphere, hydrosphere and biosphere. |
| 4 | describe and diagram the processes of water consumption, sanitation, and pollution. |
| 5 | describe the formation, properties, conservation, and role of soil in agriculture. |
| 6 | analyze the impacts of the 20th century "green revolution" on biodiversity, air and water quality, and the health of human and non-human animals. |

7	describe the history of fossil fuels, from geological origins to their use in energy production; debate the benefits and problems associated with their continued usage.
8	discuss various renewable energy sources and sustainable energy methods.
9	outline the basis of nuclear fission, describe how that energy is harnessed, and detail the fate of nuclear material; discuss the risks and benefits of this technology.
10	diagram a municipal landfill and discuss modern methods for regulating waste disposal.
11	discuss sources and types of air pollution, including the formation of photochemical smog.
12	identify pieces of environmental legislation and describe how they helped improve water or air quality, prepare an analysis of the benefits and the costs of a piece of legislation, and detail the major regulatory bodies governing environmental laws at a local, state and federal level.
13	correlate population growth with environmental issues and differentiate between population growth and that population's resource usage.

Course Content

Lecture/Course Content

- 10.50% Matter and energy: integrating the life and physical sciences, how science works
- 7.00% Biodiversity and the earth system, all life depends upon the earth
- 7.00% Soil formation, weathering, erosion, agriculture, and the future of food
- 16.00% Oceanic/atmospheric processes and global climate change
- 4.00% The water cycle, water consumption, surface, groundwater, and human impacts
- 4.00% The cryosphere: frozen water and its role in the earth-life system
- 5.00% Introduction to biodiversity in a changing world
- 10.00% Macroecology, extinction, and how humans are changing the rules
- 10.00% How life responds to change: introduction to evolution, conservation, and environmental stewardship
- 5.50% Human ecology, urban development, and sustainability
- 7.00% Powering civilization: energy resources, fossil fuels, and alternative forms of energy
- 7.00% Human impacts on the atmosphere: climate change, air pollution, economics, and policy
- 7.00% Anthropogenic waste management, land, water, and environmental toxics

Laboratory or Activity Content

NA

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
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):

Objective exams
Skills demonstrations
Written analyses
Written homework
Other (specify)
Classroom Discussion
Participation
Reports/Papers/Journals

Other

Read relevant environmental news articles, summarize and link to the course material through written or oral communication skills.

Instructional Methodology

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

Audio-visual presentations
Case studies
Class activities

Class discussions
 Computer-aided presentations
 Demonstrations
 Distance Education
 Field trips
 Group discussions
 Instructor-guided interpretation and analysis
 Instructor-guided use of technology
 Lecture
 Problem-solving examples
 Readings
 Small group activities

Describe specific examples of the methods the instructor will use:

Visual, auditory, verbal, kinesthetic, logical, interpersonal, and intrapersonal methods are used. This may include:

1. Strong visuals that drive lectures and class discussions.
2. Linguistic and auditory approaches paired with rhetorical and logical constructs to drive discussions and reasoning.
3. Tactile pedagogical techniques that make students write and draw concepts discussed.
4. Original pictures that students take and share to illustrate class concepts.
5. Class exercises that allow students to deconstruct science as a process, and iterate their own ideas as they explore and test hypotheses.
6. Physical demonstrations that illustrate environmental concepts.
7. Small group work where students showcase creative problem solving as teams.
8. Integration—take-home messages that students read intrapersonally, discuss interpersonally, and synergize for a synthetic comprehension of concepts and methods.

Representative Course Assignments

Writing Assignments

- Complete essays as short answer discussion questions on current events and research discoveries in the environmental sciences.
- Compose summaries of articles related to class topics on policy debates in the environmental sciences.

Critical Thinking Assignments

- Link current events to in-class discussions on research and policy in the environmental sciences.
- Deconstruct and itemize parts in a cost-benefit environmental analysis.

Reading Assignments

- Read about environmental challenges and solutions from the zero cost textbook.
- Read outside papers or references from the environmental sciences linked to the conversations from weekly discussions.

Skills Demonstrations

- Data science—interpret and analyze environmental data (e.g., population and demographic data, ice core data, climatological data, etc).
- Interdisciplinarity—apply knowledge from multiple disciplines simultaneously to deconstruct and resolve complex environmental problems (e.g., how anthropogenic influences affect biogeochemical patterns and cycles, from evolution and conservation to climate change, ocean, and atmospheric chemistry, etc).

Outside Assignments

Representative Outside Assignments

- Read materials from the primary through tertiary literature, websites, and popular news pieces relevant to the environmental sciences.
- Diagram the earth system and discuss the processes that integrate the life and physical sciences.
- Diagram the water cycle and discuss how water moves throughout the earth, including human impacts on this process.
- Diagram the circulation of air across latitudes on a planetary scale and discuss how global warming changes the movement of air and water on Earth.
- Diagram a municipal landfill and discuss modern methods for regulating waste disposal.

Articulation**C-ID Descriptor Number**

ENVS 100

Status

Aligned

Equivalent Courses at 4 year institutions

University	Course ID	Course Title	Units
CSU Monterey Bay	ENVS 201	Introduction to Environmental Sciences	4
CSU Channel Islands	ESRM 100	Introduction to Environmental Science and Resource Management	3
UC Irvine	UPPP 8	Introduction to Environmental Analysis and Design	4
UC Riverside	ENSC 2	Introduction to Environmental Science: Environmental Quality	4

Comparable Courses within the VCCCD

ESRM R100 - Introduction to Environmental Science

ESRM V02 - Introduction to Environmental Science

District General Education**A. Natural Sciences****A2. Physical Science**

Approved

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:

F1995

CSU GE-Breadth**Area A: English Language Communication and Critical Thinking****Area B: Scientific Inquiry and Quantitative Reasoning****B1 Physical Science**

Approved

Effective term:

Fall 1995

B3 Laboratory Activity

Approved

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

Approved

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 5A: Physical Science**

Approved

Area 6: Languages Other than English (LOTE)**Textbooks and Lab Manuals****Resource Type**

Textbook

DescriptionCunningham, William, and Mary Cunningham. *Environmental Science: A Global Concern*. 15th ed., McGraw-Hill, 2020.**Resource Type**

Textbook

DescriptionEnger, Eldon, and Bradley Smith. *Environmental Science: A Study of Interrelationships*. 16th ed., McGraw-Hill, 2021.**Library Resources****Assignments requiring library resources**

Conduct research, using the Library's online and print resources, in support of in-class and outside assignments.

Sufficient Library Resources exist

Yes

Example of Assignments Requiring Library Resources

Research topics such as the influence of automobile exhaust on the chemistry of smog; the effects of industrial agriculture on soil pollution; the impact of urbanization on conservation and habitat fragmentation; the effects of household endocrine disruptors on biological sex; among other subjects that expand upon class material.

Distance Education Addendum

Definitions

Distance Education Modalities

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

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular asynchronous discussions that facilitate students to compare/contrast, discuss, identify, analyze, and synthesize course content. e.g., "After learning about the energy resources that power humanity... What is one new INSIGHT that you've made which you hadn't realized PRIOR to these lectures? How does this insight transform how you think about the world? Explain, with attention to what you used to think vs. what you now see in light of the connections you have made."
E-mail	The class calendar, email, class announcements, and tools such as "Message Students Who" and "Assignment Comments" in Canvas will be used to communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.
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: • Recorded Lectures, Narrated Slides, Screencasts • Instructor created content • 3rd Party Lab Tools (e.g., Labster) • MC Online Library Resources • Canvas Peer Review Tool • Canvas Student Groups (Assignments, Discussions) • Websites and Blogs • Multimedia (e.g., YouTube, Films on Demand, 3CMedia, Google Earth, earth.nullschool.net, etc.)
Telephone	To remain in sync with students in need, to help, clarify, direct, and assist with learning and success.
Video Conferencing	To remain in sync with students in need, to help, clarify, direct, and assist with learning and success.

Synchronous Dialog (e.g., online chat)

Scheduled synchronous sessions may be organized at the instructor's discretion to demonstrate skills, address problems, and review asynchronous material. Synchronous sessions may also be used for students to unpack concepts and work on problem together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.

Primary Minimum Qualification

EARTH SCIENCE

Review and Approval Dates

Department Chair

02/08/2022

Dean

02/08/2022

Technical Review

03/03/2022

Curriculum Committee

03/15/2022

DTRW-I

MM/DD/YYYY

Curriculum Committee

MM/DD/YYYY

Board

MM/DD/YYYY

CCCCO

MM/DD/YYYY

Control Number

CCC000426600

DOE/accreditation approval date

MM/DD/YYYY