

ENVS 12 Course Outline as of Fall 2020**CATALOG INFORMATION**

Dept and Nbr: ENVS 12 Title: INTRO ENVIRON SCIENCE
 Full Title: Introduction to Environmental Science
 Last Reviewed: 1/27/2020

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Introduction to environmental issues from a scientific perspective, focusing on physical, chemical, and biological processes within the Earth system, the interaction between humans and these processes, and the role of science in finding sustainable solutions. Topics include ecological principles, biodiversity, climate change, sustainability, renewable and non-renewable energy, water resources, air and water pollution, and solid waste management.

Prerequisites/Corequisites:**Recommended Preparation:**

Eligibility for ENGL 1A or equivalent

Limits on Enrollment:**Schedule of Classes Information:**

Description: Introduction to environmental issues from a scientific perspective, focusing on physical, chemical, and biological processes within the Earth system, the interaction between humans and these processes, and the role of science in finding sustainable solutions. Topics include ecological principles, biodiversity, climate change, sustainability, renewable and non-

renewable energy, water resources, air and water pollution, and solid waste management. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:
	C	Natural Sciences	Fall 1985	
	H	Global Perspective and Environmental Literacy		
CSU GE:	Transfer Area		Effective:	Inactive:
	B1	Physical Science	Fall 1985	
IGETC:	Transfer Area		Effective:	Inactive:
	5A	Physical Sciences	Fall 2008	
CSU Transfer:	Transferable	Effective:	Fall 1985	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1985	Inactive:

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Identify global, regional, and local environmental issues, analyze their scientific basis, and identify potential solutions.
2. Examine the relationships between humans and the environment.
3. Use scientific methodologies, including the construction and utilization of scientific models.

Objectives:

Students will be able to:

1. Relate conservation of mass and the laws of thermodynamics to Earth's environment.
2. Diagram the flow of energy and matter through ecosystems.
3. Use population and community dynamics to examine environmental issues and potential solutions.
4. Interpret data and use models to evaluate the relationship between populations and the environment.
5. Evaluate scientific, social, economic, cultural and legislative factors associated with addressing environmental problems.
6. Analyze personal environmental impacts.
7. Research, evaluate, and cite information from a variety of sources.
8. Construct and interpret scientific tables, graphs and figures.

Topics and Scope:

I. Introduction to Environmental Science

- A. Scientific methodologies
- B. Role of science in solving environmental problems
- C. Interpreting tables, graphs and figures
- D. Finding and evaluating scientific information
- E. Environmental history
- F. Underlying causes of major environmental issues
- G. Sustainability
 - 1. economic
 - 2. social
 - 3. environmental

II. Ecological Principles

- A. Energy flow through ecosystems
- B. Flow of matter/biogeochemical cycles
 - 1. carbon
 - 2. nitrogen
 - 3. other
- C. Population dynamics
 - 1. distribution
 - 2. demographic indicators
 - 3. evolution
 - 4. natural selection
- D. Biological communities
 - 1. species interactions
 - 2. ecological niche
 - 3. succession

III. Biodiversity

- A. Species, genetic and ecosystem diversity
- B. Ecosystem services
- C. Threats
 - 1. habitat loss/land degradation
 - 2. invasive species
 - 3. pollution
 - 4. overexploitation
- D. Conservation and restoration
- E. Legislation and policy - Endangered Species Act

IV. Water

- A. Resource issues
 - 1. water availability
 - 2. flooding
 - 3. drought
 - 4. groundwater depletion
- B. Water conservation and management
- C. California and Sonoma County water resources
- D. Personal water use
- E. Water pollution
 - 1. types

- 2. sources
- 3. effects
- F. Legislation and policy
 - 1. Safe Drinking Water Act
 - 2. Clean Water Act

V. Air

- A. Air pollution
 - 1. types
 - 2. sources
 - 3. effects
 - 4. solutions
- B. Legislation and policy: Clean Air Act and other current legislation

VI. Global Climate Change

- A. Natural vs. anthropogenic
- B. Causes and time scales
- C. Impacts
- D. Solutions

VII. Energy

- A. Energy conservation and efficiency
- B. Non-renewable energy resources (fossil fuels and nuclear)
 - 1. types
 - 2. pros and cons
 - 3. new technologies
 - 4. supply
 - 5. storage
- C. Renewable energy resources
 - 1. types
 - 2. pros and cons
 - 3. new technologies
 - 4. supply
 - 5. storage
- D. Energy strategies
 - 1. centralized
 - 2. decentralized
- E. Legislation and policy

VIII. Solid and Hazardous Waste

- A. Sources, disposal methods, environmental impacts
- B. Waste prevention and recycling
- C. Legislation and policy
 - 1. Resource Conservation and Recovery Act
 - 2. Superfund Act

Optional topics include:

IX. Environmental Health and Toxicology

- A. Toxins and toxicity levels
- B. Risk assessment and the precautionary principle

X. Agriculture and Soil

- A. Types and methods of production
- B. Artificial selection and genetic engineering
- C. Soil formation, degradation and conservation practices
- D. Environmental impacts and solutions

XI. Marine Ecosystems

- A. Ocean life zones
- B. Impacts related to resource extraction, pollution and climate change
- C. Environmental legislation and policy

XII. Urbanization and Sustainable Communities

- A. Issues associated with urbanization
- B. Urban planning and green building
- C. Environmental justice

Assignment:

1. Textbook and/or assigned reading (20-30 pages per week)
2. Written, short answer, problem solving, and/or online assignments (e.g. model development, calculations and data analysis) (5 -20)
3. Research/analysis papers or project(s) (1-2)
4. Presentation(s) (0-3)
5. Examination(s) (1-5) and quiz(zes) (0-20)
6. Field trip(s) and reports: in-person and/or virtual field trip options (not necessarily scheduled during class hours) (0-4)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Research/analysis papers or project(s), field-trip reports, written homework assignments

Writing
25 - 45%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework, online assignments

Problem solving
0 - 45%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations
0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Exams and quizzes

Exams
30 - 70%

Other: Includes any assessment tools that do not logically fit into the above categories.

Individual and/or group presentations, participation in class activities and field trips

Other Category
0 - 15%

Representative Textbooks and Materials:

Environment. 10th ed. Hassenzahl, David and Hager, Mary and Gift, Nancy. Wiley. 2018
Environmental Science. 13th ed. Wright, Richard and Boorse, Dorothy. Prentice Hall. 2017
Environment and You. 3rd ed. Christensen, Norm and Leege, Lissa and St. Juliana, Justin. Prentice Hall. 2019
Living in the Environment. 20th ed. Miller, Tyler and Spoolman, Scott. Cengage Learning. 2021
Principles of Environmental Science. 9th ed. Cunningham, William and Cunningham, Mary. McGraw Hill. 2020
Essential Environment: The Science behind the Stories. 6th ed. Withgott, Jay and Laposata, Matthew. Prentice Hall. 2018

Instructor prepared materials