ENVS 12 Course Outline as of Fall 2008

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 contemporary environmental issues related to resource use, pollution, and human population growth.

Prerequisites/Corequisites:

Recommended Preparation:
Completion of or concurrent enrollment in ENGL 100 or ESL 100. Eligibility for ENGL 1A.

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 contemporary environmental issues related to resource use, pollution, and human

population growth. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Completion of or concurrent enrollment in ENGL 100 or ESL 100. Eligibility for ENGL 1A.
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:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
1. Summarize the first two laws of thermodynamics and the law of conservation of mass and identify specific ecological and environmental consequences of these laws.

2. Diagram energy flow through an ecosystem and the cycling of matter within an ecosystem and use the resulting models to examine specific environmental issues.

3. Use population and community dynamics to examine specific environmental issues and the sustainability of specific solutions.

4. Utilize demographic data and models to evaluate the relationship between human population dynamics and current/future environmental issues.

5. Identify major environmental legislation and discuss the scientific basis of the legislation.

6. Identify social, economic, and cultural considerations related to specific environmental issues and analyze their effects on solving environmental problems.

7. Analyze personal environmental impact and how specific personal decisions affect resource use and pollution; extrapolate findings to a larger community.

8. Research, evaluate, and cite information from newspapers, magazines, scientific journals, books, websites, and personal communications.

9. Interpret and construct scientific tables, graphs, and figures.

Topics and Scope:

1. Introduction to Environmental Science
 A. Scientific methodologies
 B. Role of science in solving environmental problems
 C. Interpreting scientific tables, graphs, and figures
 D. Finding and evaluating scientific information
 E. Brief environmental history of the United States
 F. Categories and underlying causes of major environmental issues
 G. Environmental sustainability
2. Ecological Principles
 A. Energy flow through ecosystems
  1) Energy forms and the laws of thermodynamics
  2) Food chains
  3) Bioaccumulation and biomagnifications of contaminants
 B. Cycling of matter within ecosystems
  1) Conservation of mass
  2) Biogeochemical cycles (carbon, nitrogen, phosphorus, sulfur, water)
  3) Feedback mechanisms
 C. Earth's physical environment
 D. Populations: evolution, population ecology, human demographics
 E. Biological communities: species interactions, ecological niche, succession
3. Biodiversity
 A. Scientific basis: importance, hotspots, endangered and threatened species, invasive species, ecological restoration
 B. Legislation: Endangered Species Act
 C. Social, economic, and/or cultural impacts/considerations
4. Water
 A. Water as a resource
  1) Properties and importance
  2) Resource issues: flooding, drought, groundwater depletion, salinization, wetland loss
  3) Water conservation and management: agricultural, industrial, and municipal use; wastewater reuse; grey-water recycling
  4) California and Sonoma County water resources and use
  5) Personal water use
 B. Water Pollution
  1) Types, sources, and effects of water pollution
  2) Improving water quality
  3) Wastewater and drinking water treatment
 C. Legislation: Safe Drinking Water Act, Clean Water Act
 D. Social, economic, and/or cultural impacts/considerations
5. Air
 A. Air as a resource: properties and importance
 B. Air pollution: types, sources, effects, solutions
 C. Regional and global atmospheric changes: causes, effects, solutions
  1) Global climate change
  2) Ozone depletion

3) Acid deposition
D. Legislation: Clean Air Act, Kyoto Protocol, Montreal Protocol
E. Social, economic, and/or cultural impacts/considerations

6. Energy
A. Units for energy and power
B. Conservation and efficiency
C. Fossil fuels: types, origin, availability, pros and cons, new technologies
D. Nuclear energy: types, pros and cons, safety, radioactive waste
E. Renewable energy: types, pros and cons, new technologies
F. Energy strategies: national, local, personal
G. Social, economic, and/or cultural impacts/considerations

7. Solid and Hazardous Waste
A. Solid waste: types, sources, disposal methods, environmental impacts
B. Hazardous waste: types, sources, disposal methods, environmental impacts
C. Waste prevention: reduction, reuse, recycling
D. Legislation: Resource Conservation and Recovery Act, Superfund Act
E. Social, economic, and/or cultural impacts/considerations

Assignment:

1. Textbook reading and/or assigned reading from journals, newspapers, websites, and peer-reviewed or popular journals. Reading will vary depending on the topic, but will average approximately 20-30 pages per week (based on a 17.5 week semester)
2. In class and homework activities. (e.g. calculations, model development and use, discussions, debates, research, short answer responses, individual or group presentations.)
3. Three to five short (2-3 page) writing assignments that focus on summary, analysis, and evaluation. (e.g. fieldtrip reports, current event analysis, personal ecological footprint, personal carbon budget, energy audit, product life-cycle costs, review of a scientific paper)
4. Research/analysis paper (4-8 pages) on a local/regional environmental issue. The paper will require research, analysis, and bibliographic documentation.
5. Two to five examinations based on reading and lecture material. Exams may be cumulative or unit exams, and will include a combination of objective and written responses.
6. One or two field trips. Field trips may be scheduled during or outside of class hours. Students will be given several options to choose from and may work with the instructor to develop additional options.

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 paper, field-trip reports, current-event reports	Writing 25 - 50%

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

Calculations, homework problems, model development and use	Problem solving 0 - 10%

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.

Essay exams, objective exams (multiple choice, true/false, matching, short answer)	Exams 40 - 60%

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

Individual and group presentations, participation in class activities and fieldtrips	Other Category 0 - 15%

Representative Textbooks and Materials:
Environment. Raven, Berg, and Hassenzahl (6th). Wiley: 2008.
Environmental Science. Wright, Richard (10th). Prentice Hall: 2008.
Environmental Science: Principles, Connections, and Solutions (12th). Miller and Spoolman. Brooks & Cole. 2008.
Environmental Science: A Global Concern (10th). Cunningham and Cunningham. McGraw Hill. 2008.
Students will also read journal and newspaper articles and the websites of local, national, and international government agencies and environmental interest groups.