

CATALOG INFORMATION

Dept and Nbr: BIO 12

Title: BASIC CONCEPTS/ECOL

Full Title: Basic Concepts of Ecology

Last Reviewed: 1/24/2022

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	5	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:

Basic principles of ecology, including ecosystem and population biology and their application to problems of renewable resource conservation and management.

Prerequisites/Corequisites:

Recommended Preparation:

Completion or concurrent enrollment in ENGL 100A, 100B or 100.

Limits on Enrollment:

Schedule of Classes Information:

Description: Basic principles of ecology including ecosystems and population biology and their application to problems of renewable resource conservation and management. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Completion or concurrent enrollment in ENGL 100A, 100B or 100.

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 1981	
	H	Global Perspective and Environmental Literacy		
CSU GE:	Transfer Area		Effective:	Inactive:
	B2	Life Science	Fall 1981	
IGETC:	Transfer Area		Effective:	Inactive:
	5B	Biological Sciences	Fall 1981	
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

Certificate/Major Applicable:

Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Students completing Biology 12 will be able to describe, understand, analyze and demonstrate knowledge in the following areas by means of oral and written assignment and exams:

1. Methods of science and scientific investigation.
2. History of the discipline, including the science of ecology, conservation, environmentalism and the development of environmental ethics.
3. The basic principles and assumptions of ecology, including the properties of "open" and "closed" systems, patterns of cyclic and linear processes, interdependency, exponentiality and the relationship of diversity, complexity and sustainability.
4. The basic design and function of natural systems, including the cellular nature of life, correlation of structure and function, energy transformation, growth and change and evolution.
5. The basic biosphere processes including climatic, physiographic and biotic and their relationship to major landscape or biome distribution.
6. Ecosystem structure and function including trophic structure and function (eg. food webs), productivity, mineral cycles and management problems.
7. Community dynamics, including factors influencing the distribution of organisms, species diversity and dominance, vegetation ecology, niche, species interactions and ecological succession.
8. Population dynamics, including patterns of distribution and dispersal, age structure, growth, "r" vs "k" characteristics, interspecific and intraspecific factors in environmental resistance and application to human population dynamics.

9. Managing biosphere resources including general management trends, interplay of economic and ecological considerations, examples in ecosystem management (eg. forests, rangelands, wetlands), endangered species and the maintenance of biodiversity.

Topics and Scope:

1. Ecology as Science:
 - a. Course introduction
 - b. Scientific approaches to problems - the science way to know
2. Development of Ecology and Environmentalism:
 - a. Early conservation concerns eg. Thoreau
 - b. Ecology - the synthesis of Darwin and Thoreau
 - c. The development of environmental ethics
 - d. The ecological imperative
3. Foundational Principles:
 - a. "Open" vs. "closed" systems
 - b. Cyclic vs. linear processes
 - c. Cybernetics, negative feedback and interdependencies
 - d. Exponentiality
 - e. Diversity and Complexity
 - f. Sustainability
4. Design of Natural Systems:
 - a. Life is cellular
 - b. Structure and function
 - c. Energetics
 - d. Growth and change
 - e. Evolution
 1. Species adaptations
 2. Speciation
 3. Evolution of ecosystems
5. Biosphere Structure and Function:
 - a. Climate: precipitation, temperature, climatic zones
 - b. Physiographic: tectonics, rock cycles, continental drift, topography
 - c. Biotic: effect of A and B on biogeography and formation of major landscape types (Biomes)
6. Ecosystem Structure and Function:
 - a. Principles of cycle and flow
 - b. Trophic structure
 - c. Productivity
 - d. Mineral cycles
 - e. Issues in ecosystem resource management
7. Community Structure and Function:
 - a. Organismic distribution and limiting factors
 - b. Diversity, dominance, complexity and stability
 - c. Vegetation: community structure and landscape design
 - d. The "niche" as a community function
 - e. Species interactions
 - f. Ecological succession
8. Population Structure and Function:
 - a. Patterns of distribution and dispersal

- b. Age structure and life tables
 - c. Population growth
 - d. Dynamics of "r" and "k" selected species
 - e. Environmental resistance relative to both interspecific and intraspecific factors.
 - f. Human population dynamics
9. Management and Conservation of Natural Resources:
- a. General principles of sustainable resource management
 - b. The interface of ecology and economics
 - c. Ecosystem management case studies eg. forests, rangelands, wetlands
 - d. Endangered species
 - e. Importance and maintenance of biodiversity

Assignment:

- 1. Read text and other assigned readings.
- 2. Term report.

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.

Essay exams, Term papers

Writing
10 - 30%

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

Quizzes, Exams

Problem solving
5 - 20%

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.

Multiple choice, Matching items, Completion

Exams
60 - 80%

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

None

Other Category
0 - 0%

Representative Textbooks and Materials:

THE WAY THE WORLD WORKS, 5th ed., Nebel and Wright, Prentice Hall, 1995
ENVIRONMENT, 2nd ed., Raven, Berg and Johnson, Saunders, 1995

ENVIRONMENTAL SCIENCE, Botkin and Keller, John Wiley and Sons, 1995
THE ECONOMY OF NATURE, 3rd ed., Richlefs, 1996