



COWLEY COLLEGE

& Area Vocational Technical School

COURSE PROCEDURE FOR

ENVIRONMENTAL BIOLOGY BIO 4118 3 Credit Hours

Student Level:

This course is open to students on the college level in either the freshman or sophomore year.

Catalog Description of the Course:

BIO 4118 - ENVIRONMENTAL BIOLOGY (N) (3 hrs)

Topics include the relationship of the human species to the environment. Emphasis is placed on the understanding of the basic and ecological principles and the ecological crises confronting the human species. Survey studies of bodily, aquatic, and terrestrial ecosystems are included. Aspects of health ecology also are covered in the course.

Prerequisites:

None

Controlling Purpose:

This course is designed to treat environmental science as an interdisciplinary study, combining ideas and information from natural sciences (such as biology, chemistry, and geology) and social sciences (such as economics, politics, and ethics) to present a general idea of how nature works and how things are interconnected. This study of connections in nature examines how the environment is being used and abused, and what individuals can do to protect and improve it for themselves, for future generations, and for other living things.

Learner Outcomes:

Upon completion of this course students will have an understanding of the integrated study of environmental problems, connections, and solutions: biodiversity, pollution prevention and waste reduction, population, exponential growth and runaway feedback, science systems and technology, sustainability, energy and energy economics, environmental politics and laws, and individual action.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other material as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.

- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

PART 1 : HUMANS AND NATURE						
Outcomes: The student will gain an overview of environmental problems and their causes and a brief history of resource use and conservation.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe a sustainable system and how it survives and functions over some specified time.
						Describe a sustainable society and how it manages its economy and population size.
						Explain Growth and the Wealth Gap including linear and exponential growth, human population growth and economic growth.
						Distinguish between nonrenewable resources and renewable resources, and demonstrate the connections between renewable resources and the Tragedy of the commons.
						Describe pollution and its sources, the effects of pollution, methods of dealing with pollution and prevention and cleanup.
						List environmental resource problems and their root causes.
						Give a brief history of resource use and conservation and cultural change.
						Distinguish between hunting and gathering societies, agricultural societies, and industrial societies.
						Explain Resource conservation and environmental protection in the United States.

PART 2 : SCIENTIFIC PRINCIPLES AND CONCEPTS

Outcomes: The student will gain an overview of science, models and systems, matter and energy resources, ecosystems and how they work, climate, weather and life, changes in populations, communities, and ecosystems and geologic processes.

A	B	C	D	F	N	Specific Competencies Demonstrate the ability to:
						Describe what scientists do and outline the scientific methods.
						Distinguish between mental models, conceptual models, graphic models, physical models, and mathematical models.
						Explain the properties of atoms and ions, compounds, and matter.
						Describe the nature of science, technology and environmental science, system models, and basic and complex system structures and their behaviors.
						Explain matter and energy resources, types and concepts.
						Describe Ecosystems and how they work.
						Explain life and earth=s life-support systems including metabolism, reproduction, mutation and evolution.
						Be able to describe connections between climate, weather and life.
						Describe biomes, including deserts and semideserts, grasslands, and forests. Distinguish between polar, subpolar, temperate, and tropical climates.
						Describe life in aquatic environments including the coastal zone, coral reefs, open sea, freshwater lakes, freshwater streams, and freshwater inland wetlands.
						Explain changes in populations, communities and ecosystems.
						Explain the responses of living systems to environmental stress.
						Describe geologic processes.
						Distinguish between internal and external earth processes.
						Explain mineral resources and the rock cycle, and crustal resources.
						Distinguish between and list natural hazards.

PART 3 : THE HUMAN POPULATION

Outcomes: The student will gain an overview of factors affecting human population size and urban living.

Specific Competencies						
A	B	C	D	F	N	Demonstrate the ability to:
						Explain the factors affecting human population size, including birth and death rate, fertility, age structure and solutions.
						Describe urbanization, urban growth and population distribution.
						Describe the urban resource and environmental problems associated with it.
						Explain urban land use, planning, control, and solutions to making urban areas more livable and sustainable.

PART 4 : ULTIMATE GLOBAL PROBLEMS

Outcomes: The student will gain an overview of deforestation and loss of biodiversity, global warming and ozone loss.

Specific Competencies						
A	B	C	D	F	N	Demonstrate the ability to:
						Describe the types and importance of forests.
						Explain tropical deforestation and the causes and consequences of biodiversity losses.
						Explain global warming and its effects, and list solutions dealing with the threat of global warming.
						Explain ozone depletion and solutions for protecting the ozone layer.

PART 5 : ENERGY RESOURCES

Outcomes: The student will gain an overview of energy efficiency, renewable energy, and nonrenewable energy resources.

Specific Competencies						
A	B	C	D	F	N	Demonstrate the ability to:
						List and describe energy resources and understand the importance of improving energy efficiency.
						Compare and contrast solar energy, moving water, heat stored in water, wind and biomass for producing heat and electricity.
						Distinguish between oil, natural gas, coal, and nuclear energy as nonrenewable energy resources.

PART 6 : RISKS, HEALTH, RESOURCES AND POLLUTION

Outcomes: The student will gain an overview of risk toxicology and human health; air and air pollution; water resources; water pollution; minerals and soil; solid and hazardous waste.

Specific Competencies						
A	B	C	D	F	N	Demonstrate the ability to:
						Explain the atmosphere, outdoor air pollution, indoor air pollution, the effects of air pollution on living organisms, and materials and solutions for preventing and controlling air pollution.
						Explain water=s importance and unique properties, including the supply, renewal and use of water resources, water resource problems and solutions.
						List and describe types and sources of water pollution.
						Describe mineral supplies and environmental impacts, soil erosion and solutions for soil conservation.
						Explain reuse, recycling and hazardous waste regulation in the United States.

PART 7 : SUSTAINING BIODIVERSITY AND BIOLOGICAL INTEGRITY

Outcomes: The student will gain an overview of food resources, protecting food resources, sustaining ecosystems and wild species.

Specific Competencies						
A	B	C	D	F	N	Demonstrate the ability to:
						Describe food production, world food problems, methods of increasing world food production, agricultural policy, food aid, and land reform.
						Distinguish between pesticide types and uses and the regulation of pesticide in the United States. Describe other ways to control pests.
						Explain managing and sustaining forests, rangelands, national parks, biodiversity sanctuaries and public lands in the United States.
						Describe wildlife management, protection of wild species from extinction and fishery management.

PART 8 : ENVIRONMENT AND SOCIETY

Outcomes: The student will gain an overview of economics and environment, politics and environment and environmental worldviews, ethics, and sustainability.

						Specific Competencies
A	B	C	D	F	N	Demonstrate the ability to:
						Explain economic goods, resources and systems, growth and external costs.
						Describe politics and environmental policy and anti environmental groups.
						Describe human centered environmental worldviews in industrial societies.
						Describe life-centered and earth-centered environmental worldviews.

Projects Required:

None

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

- Compound microscopes
- Dissecting microscopes
- Audio-visual materials (slides, tapes, charts, films, power point)
- Demonstration collections of local flora and fauna
- Overhead projector
- Slide/filmstrip projector

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy (24)

Course Time Frame:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-

established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time, The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.