

# SYLLABUS

## ENVS& 100 Survey of Environmental Science

Russ Jones

### I. COURSE DESCRIPTION AND PREREQUISITES

#### ENVS& 100 Survey of Environmental Science

*Recommended Preparation: ENGL 095 or placement in ENGL& 101; placement in MATH 098.*

A course addressing the nature of the physical environment and changes in the environment caused by people. Fundamental considerations of matter and energy are followed by studies of human population dynamics, food supplies, hazardous chemicals, air and water pollution, geological and energy resources, and problems associated with storing waste.

### II. AIMS AND OBJECTIVES

ENVS& 100 supports each of the five Desired Student Abilities:

#### A. Competency in the Disciplines (rating: 4)

The focus of the course is on the major topics that comprise the discipline of environmental science. Students study the flow of matter and energy throughout the environment, trends in human population demographics, and health hazards and toxicology. They investigate the effects of human activities, such as agriculture, water and energy consumption, and waste disposal, on the environment. They examine current environmental problems, including air and water pollution, global warming, ozone depletion, and over-population, as well as proposed solutions for correcting these problems.

On a broader scale, students consider the nature of science and the scientific method, as well as some of the most important tenets of science, including Atomic Theory, Cell Theory, the Law of Conservation of Matter, and the Laws of Thermodynamics.

#### B. Literacy (rating: 2)

Students have frequent reading and writing assignments, including defining terms and answering questions from the text. The variety of activities in the course appeals to different learning styles.

#### C. Critical Thinking (rating: 2)

Students discuss the concept of critical thinking during the first week of the course. Throughout the course, they consider their own points of view, as well as those of the instructor, textbook, and other sources of information, as they analyze environmental problems. They also consider the implications and

consequences of applying solutions that attempt to correct environmental problems.

**D. Social and Personal Responsibility (rating: 2)**

Although the course is mainly concerned with the state of the environment in the United States, the rest of the world is not ignored. Special attention is given to the differences between less- and more-developed countries in terms of demographics and resource consumption.

The course encourages personal responsibility by promoting appropriate classroom behavior and good work habits. It also encourages group activity with the inclusion of the poster session.

In the section of the course on health hazards and toxicology students examine how poverty and life-style choices can affect health.

**E. Using Resources (rating: 3)**

Students make use of information resources throughout the course. In addition to web-based activities, in which they obtain information from the World Wide Web on specific environmental problems, they also use the web to research alternate energy sources for their group presentations. Many students use computers to prepare their assignments.

**III. TEXTBOOK**

Principles of Environmental Science, Fourth Edition, William P. and Mary Ann Cunningham, McGraw Hill, 2008

**IV. OTHER INSTRUCTIONAL MATERIALS**

Review sheets containing objective for each chapter are provided before a new section of material is covered.

**V. TECHNIQUE OF INSTRUCTION**

ENVS& 100 meets for five one-hour lecture sessions per week. Each session allows ample time for questions and discussion. Students are evaluated based on their performance in four different activities:

- **Review Questions and Terms:** Students answer selected items from the *Review Questions* section at the end of each chapter covered in the text. They also define terms from each chapter.
- **Quizzes and Examinations:** There are eight or nine quizzes, one on each chapter covered. Only the scores on the best six quizzes are included in a student's grade. There are three examinations, the third of which is given during finals week. The format of the quizzes and examinations includes multiple choice, true-false, and matching sections, as well as short-answer questions.

- **Web-Based Activities:** Students complete five activities using information obtained from the World Wide Web. Topics include demography, food and agriculture, toxic chemicals, water flow in rivers, and superfund clean-up sites.
- **Poster Session:** Students divide into groups and prepare a poster describing an alternate energy source. Individual students are graded on their participation in the activity by the other members of the group, and each group presentation is graded by the other members of the class and sometimes the instructor.

During a class session early in the quarter, students assemble into groups and select an alternate energy source. They discuss the types of information that should be included on the poster and appropriate sources of information. They also establish grading criteria and a time-line for completion of the project. Two additional class sessions are used during the quarter for groups to meet to select the information to be used on the poster and to prepare the poster.

The dates on which these activities are to be completed are announced well in advance.

## **VI. ORGANIZATION OF COURSE CONTENT**

### **A. Introduction to Environmental Science**

- Components of the environment
- The nature of science and the scientific method
- Critical thinking
- Restoration and rehabilitation of damaged ecosystems
- Current environmental problems
- Disparities between less- and more-developed countries

### **B. Matter and Energy in the Environment**

- The nature of energy and the Laws of Thermodynamics
- The composition and structure of matter; the Law of Conservation of Matter
- Cell Theory and the structure of cells
- The components and structure of an ecosystem
- The flow of energy through an ecosystem
- Biogeochemical cycles, the flow of matter through an ecosystem, and the disruption of these cycles by human activities

### **C. Human Populations**

- Historic and future trends in world population
- Factors that affect trends in world population
- Demographic differences between less- and more-developed countries
- Demographic transitions as countries become more developed

### **D. Food and Agriculture**

- Sources of nutrition and major food crops
- Soil and its depletion
- Agricultural resources — water, energy, fertilizer, and pest control
- The impacts of the Green Revolution and genetic engineering on agriculture

### **E. Health Hazards and Toxicology**

- Factors that affect health — infectious organisms, toxic chemicals, life-style, poverty
- Hazardous chemicals — their movement through and effects on the environment
- Dose-response curves and acute and chronic effects of toxic chemicals
- Risk assessment and management

### **F. Air**

- Components and structure of the atmosphere
- Global warming
- Ozone depletion
- Air pollution

### **G. Water**

- Water resources and water consumption
- Water pollution

### **H. Energy**

- Energy resources and energy consumption
- Conventional energy sources — fossil fuels, hydroelectric power, nuclear energy
- Alternate energy sources — poster session

### **I. Waste Disposal**

- The waste stream and methods of waste disposal
- Reducing the waste stream
- Hazardous waste disposal
- Superfund sites

## **VII. Technique of Instruction and Methods of Evaluation**

ENVS& 100 meets for five one-hour lecture sessions per week. Each session allows ample time for questions and discussion. Students are evaluated based on their performance in four different activities:

Students are evaluated based on the following percentage distribution

<b>Activity</b>	<b>Percent</b>
Review Questions and Terms	25
Quizzes	15
Exams	30
Web-Based Activities	15
Poster Session	15

The grading scale is:

87 – 89%	B+	77 – 79%	C+	67 – 69%	D+		
93 – 100%	A	83 – 86%	B	73 – 76%	C	60 – 66%	D
90 – 92%	A–	80 – 82%	B–	70 – 72%	C–	0 – 59%	F

### **VIII. ATTENDANCE POLICY**

Attendance is strongly recommended. Students are accountable for the proceedings of the class whether they attend or not.

### **IX. DISABILITIES STATEMENT**

Students who have documented disabilities that require accommodation in compliance with the Americans with Disabilities Act should contact the Disability Support Services coordinator as well as the instructor of the course in order to ensure that together we create an optimal environment for educational achievement.