

Instructor: Dr. Sara Fenske

Courses: Honors Environmental Science

Academic Year: 2009-2010

Course Philosophy: This course is an introduction to environmental science: the study of the interactions between living and non-living things. The success of this course depends on your enthusiasm, hard work, and participation.

Course Requirements:

- 1) Environmental Science by Karen Arms, published by Holt, Rhinehart, and Winston
- 2) Binder for Handouts and paper for notes
- 3) Pencil or Pen (blue or black)
- 4) All handouts
- 5) Netbooks and access to the internet

Grading Procedure: Grades are based on a combination of two major exams, tests, quizzes, writing assignments (including lab reports), and projects. Tests will be worth twice as much as quizzes and lab reports. As stated in the Student Handbook, "To emphasize the importance of growth through the school year, the weight of each trimester grade has been changed. The first trimester will count as 15%, the second as 25%, the third as 35%, the mid-year exam as 10%, and the final exam as 15%."

Grading Scale: As stated in the Student Handbook, letter grades are determined based on the following scale:

A- to A+: 90-100

D- to D+: 60-69

B- to B+: 80-89

F: 0-59

C- to C+: 70-79

Homework/ Classwork Policies:

1. Homework, writing and reading assignments must be completed by the assigned date. Any long-term projects should be worked on daily so that the task is completed on time and will earn the best grade.
2. Two major exams will be given, one mid-year and one at the end of the year. Both exams are cumulative.
3. All assignments should be turned in on the due date during the class period. The maximum score for any late assignments will decrease by 10% for every day late until the grade reaches a maximum score of 50%. Any work not turned in will receive a 0.
4. All work must be legibly written or typed, and grammatically correct.
5. Keep all handouts, homework, returned homework and exams in a binder.
6. Ask questions about any instructions that are not clear.

Classroom Policies:

1. Daily, *prepared* attendance is mandatory. The school's attendance policy will be strictly enforced.
2. You are solely responsible for any material covered or announcements made during your absence.
3. You are expected to treat everyone with respect at all times.
4. Cheating or plagiarism will result in a 0 grade for that assessment and may require you to appear before the honor code committee.
5. During all labs, safety comes first! To ensure that you understand what safe lab conduct is, you will be asked to sign a lab safety contract.
6. Finally, you are expected to ask questions about any material that is not clear. Do not worry about a question being too simple. If you don't understand, chances are others don't also (Yes, this is really true).

EcoLog – Your EcoLog will be an essential part of the Environmental Science curriculum. Each day when you arrive in class there will be an EcoLog prompt posted for you to write about in your EcoLog. You should arrive in class, put away the books you do not need in my class, retrieve your EcoLog, and begin answering the question(s) in your EcoLog (bound Composition book). These prompts will be the basis for our discussions on some days, some days you will be graded on their content, and other days they will simply be thought exercises. Regardless, each day you will be given a grade for writing your prompt. You will not know which prompts will be additionally graded for content; however you should answer each prompt as though you will be graded on them to receive the highest grade each day. These are individual writing assignments so there should be no talking or sharing information during EcoLog prompt writing time. You will have approximately 5 minutes to complete the prompt and then we will begin class. If you have done your HW from the night before, you should not have any trouble writing about the prompt topic; however if you do not know where to begin, ask ME, **not** your classmates. Talking during prompt writing time will give **you and the person to whom you are speaking** an automatic zero for your prompt writing grade for the day.

Tentative Schedule:

Week	Topics	Chapters
1	What is Environmental Science?	Ch. 1
2	The Environment and Society	Ch. 1
3	Scientific Methods	Ch. 2
4	Making Informed Decisions	Ch. 2
5	The Geosphere/ The Atmosphere	Ch. 3

6	The Hydrosphere/ The Biosphere	Ch. 3
7	Water Resources	Ch. 11
8	What Causes Air Pollution?	Ch. 12
9	Climate and Climate Change	Ch. 13
10	The Ozone Shield	Ch. 13
11	Global Warming	Ch. 13
12	Nonrenewable Energy	Ch. 17
13	Thanksgiving Break	
14	Nonrenewable Energy	Ch. 17
15	Renewable Energy	Ch. 18
16	Renewable Energy	Ch.18
17-18	Christmas Break	
19	Ecosystems: Everything is Connected/ Evolution	Ch. 4
20	The Diversity of Living Things	Ch. 4
21	Energy Flow in Ecosystems	Ch. 5
22	Cycling of Materials	Ch. 5

23	Review/ Mid-Year Exams	
24	What is a Biome/ Forest Biomes	Ch. 6
25	Grassland, Desert, and Tundra Biomes	Ch. 6
26	Freshwater Ecosystems	Ch. 7
27	Marine Ecosystems	Ch. 7
28	Land Use and Pollution	Ch. 14
29-30	Spring Break	
31	Water Use and Pollution	Ch. 11
32	Feeding the World	Ch. 15
33	Human Population Growth	Ch. 9
34	Crops and Soil/ Animals and Agriculture	Ch. 15
35	Solid Waste	Ch. 19
36	Reducing Solid Waste	Ch. 19
37	Minerals and Mining	Ch. 16
38	Review for Final Exam	
39	Final Exam Week	

Honors Environmental Science Outline:

I. Science and the Environment

A. Understanding Our Environment

i. What is Environmental Science?

- a) The Goals of Environmental Science
- b) Fields of Study in Environmental Science

ii. Our Environment Through Time

- a) Hunter-Gatherers
- b) The Agricultural Revolution
- c) The Industrial Revolution
- d) Improving Quality of Life
- e) Earth as a Closed System
- f) Population Growth

iii. What are Our Main Environmental Problems?

- a) Resource Depletion
- b) Pollution
- c) Loss of Biodiversity

B. The Environment and Society

i. The Tragedy of the Commons

ii. Economics and the Environment

- a) Supply and Demand
- b) Costs and Benefits
- c) Risk Assessment
- d) Developed and Developing Countries
- e) Population and Consumption

iii. Environmental Science in Context

- a) Critical Thinking and the Environment
- b) A Sustainable World

II. Tools of Environmental Science

A. Scientific Methods

i. The Experimental Method

ii. The Correlation Method

B. Scientific Habits of Mind

C. Making Informed Decisions

- i. An Environmental Decision-Making Model
- ii. How to Use the Decision-Making Model

III. The Dynamic Earth

A. The Geosphere

- i. The Earth as a System
- ii. Discovering Earth's Interior
 - a) The Composition of the Earth
 - b) The Structure of the Earth
- iii. Plate Tectonics
- iv. Earthquakes
- v. Volcanoes
- vi. Erosion

B. The Atmosphere

- i. Composition of the Atmosphere
- ii. Layers of the Atmosphere
- iii. Energy in the Atmosphere
- iv. The Greenhouse Effect

C. The Hydrosphere and Biosphere

- i. The Hydrosphere and Water Cycle
- ii. Earth's Oceans
- iii. Fresh Water
- iv. Groundwater
- v. The Biosphere

IV. Water Resources

- A. The Water Cycle
- B. Global Water Distribution
- C. Surface Water
- D. Groundwater

V. Air Pollution

- A. What Causes Air Pollution?
 - i. Primary and Secondary Pollutants
 - ii. History of Air Pollution

iii. Motor Vehicle Emissions

iv. Industrial Air Pollution

VI. Atmosphere and Climate Change

A. Climate and Climate Change

i. Factors that Determine Climate

ii. Latitude

iii. Atmospheric Circulation

iv. Oceanic Circulation Patterns

v. Topography

vi. Seasonal Changes in Climate

B. The Ozone Shield

i. Chemicals that Cause Ozone Depletion

ii. The Ozone Hole

iii. Protecting the Ozone Layer

C. Global Warming

i. The Greenhouse Effect

ii. Global Warming

iii. Consequences of a Warmer Earth

VII. Nonrenewable Energy

A. Energy Resources and Fossil Fuels

i. Electricity

ii. Energy Use

iii. How Fossil-Fuel Deposits Form

iv. Petroleum

v. Fossil Fuels and the Future

B. Nuclear Energy

i. Advantages of Nuclear Energy

ii. Disadvantages of Nuclear Energy

VIII. Renewable Energy

A. Renewable Energy Today

i. Solar Energy

ii. Wind Power

iii. Biomass

iv. Hydroelectricity

v. Geothermal Energy

B. Alternative Energy and Conservation

i. Tidal Power

ii. Ocean Thermal Energy Conversion

iii. Hydrogen Fuel

iv. Energy Efficiency

v. Cogeneration

vi. Energy Conservation

IX. The Organization of Life

A. Ecosystems: Everything is Connected

i. Defining an Ecosystem

ii. Components of an Ecosystem

iii. Habitat

B. Evolution by Natural Selection

C. Diversity of Living Things

i. Archaeobacteria and Eubacteria

ii. Fungi

iii. Protists

iv. Plants

v. Animals

X. How Ecosystems Work

A. Energy Flow in Ecosystems

i. Photosynthesis

ii. Cellular Respiration

iii. Energy Transfer

B. Cycling of Materials

i. Carbon Cycle

ii. Nitrogen Cycle

iii. Phosphorus Cycle

XI. Biomes

A. What is a Biome?

i. Biomes and Vegetation

ii. Biomes and Climate

B. Forest Biomes

i. Tropical Rain Forests

ii. Temperate Forests

C. Grasslands, Desert, and Tundra Biomes

i. Savannas

ii. Temperate Grasslands

iii. Chaparral

iv. Deserts

v. Tundra

XII. Aquatic Ecosystems

A. Freshwater Ecosystems

B. Marine Ecosystems

XIII. Land

A. Land Use and Land Cover

B. Urban Land Use

C. Land Management and Conservation

XIV. Water Use and Pollution

A. Global and Residential Water Use

B. Industrial Water Use

C. Agricultural Water Use

D. Water Management

E. Water Conservation

F. Water Pollution

i. Chemical Pollution

ii. Wastewater

iii. Thermal Pollution

iv. Groundwater Pollution

v. Ocean Pollution

vi. Water Pollution and Ecosystems

XV. Feeding the World

i. Human Nutrition

ii. Ecology of Food

iii. World Food Problems

iv. Green Revolution

XVI. Human Population Growth

A. Human Population Over Time

B. Forecasting Population Size

C. Changing Population Trends

XVII. Food and Agriculture

A. Crops and Soil

i. Traditional and Modern Agriculture

ii. Soil Fertility

iii. Soil Degradation and Conservation

iv. Pest Control

B. Animals and Agriculture

i. Fishing

ii. Livestock

XVIII. Waste

A. Solid Waste

B. Solid Waste Management

C. Reducing Solid Waste

i. Reduce

ii. Recycle

XIX. Mining and Mineral Resources

A. Minerals

B. Mineral Exploration

C. Mining

i. Subsurface Mining

ii. Surface Mining

D. Mining Regulations and Mine Reclamation

E. The Environmental Impacts of Mining