

# Advanced Placement Environmental Science

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## Course Description

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the inter-relationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them.

Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science.

This course is designed for students willing to do advanced work to prepare for the Advanced Placement Examination in Environmental Science. The level of material and instruction is equivalent to a first year environmental science course in college.

## Text

Miller, G. Tyler and Scott E. Spoolman. *Living in the Environment*, 16<sup>th</sup> Edition. Belmont, CA: Brooks/Cole, 2009.

## Course Plan

UNIT	DESCRIPTION	CHAPTER(S)
Introduction: Humans and Sustainability	Population, resources, sustainability, consumption, agricultural and forest sustainability LAB: Tragedy of the Commons FIELD STUDY: Sustainability	1
Science, Ecological Principals, and Ecosystems	Scientific method, general chemistry review, energy, weather and climate, volcanoes, earthquakes, plate tectonics LAB: Rock and Rock Cycle	2, 3, & 14
Climate and Terrestrial Biodiversity	Biomes, ecosystems, dune succession	7
Water Resources and Aquatic Biodiversity	Properties of water, aquatic biodiversity, water resources, hydrological cycles, water conservation FIELD STUDY: Aquatic field studies in a lake and river (physical, chemical, and biological data collected and analyzed)	8 & 13

Population Dynamics	Biodiversity and evolution, biodiversity, species interactions and population control, human population and its impact, density, food chains, biotic potential, environmental resistance, survivorship, demographics, fertility rate, mortality rate, governmental policies LAB: Mark and Recapture LAB: Quadrant Technique LAB: Population Distribution LAB: Carrying Capacity	4, 5 & 6
Sustaining Natural Resources	Food, soil, geology, nonrenewable minerals, nonrenewable energy, energy efficiency, renewable energy LAB: Subsurface Petrogeology Stimulation LAB: Solar House LAB: Comprehensive Soil Analysis FIELD STUDY: Forestry(collect and analyze data on commercial, residential, recreational, and other habitats.	12, 14, 15, & 16
Sustaining Biodiversity	Species extinction, U.S. Endangered Species Act, ecosystem threats, aquatic biodiversity sustainability LAB: Predator-Prey Simulation	9, 10, & 11
Sustaining Environmental Quality	Environmental hazards, air pollution, climate change and ozone depletion, water pollution, solid and hazardous waste, sustainable cities LAB: Air Pollution LAB: Monitoring Air Quality LAB: Stalinization	17, 18, 19, 20, 21, & 22
Sustaining Human Societies	Environmental history, national parks environmental legislation, economics and the environment, ethics LAB: Biodiesel	23, 24, & 25

### Laboratory Activities

Some major laboratory activities are outlined in the syllabus, but this is in no way the limit of laboratory scope of this course. A major component of this course is laboratory and fieldwork. A minimum of 25% of the weekly course time will be spent in these investigations. Each student will be required to keep a lab notebook.

## **Field Trips**

Because of the nature of the environmental science curriculum, it is crucial to get into the field and see how the information addressed in lecture and laboratory activities is used in the real world. Several trips are planned for this year.

Field trips will be scheduled to the following locations:

- Landfill
- Wastewater Treatment Plant
- Recycling Center
- University of Michigan (School of Natural Resources & Arboretum)
- Various terrestrial and aquatic environments

Students will keep field journals based on these trips.

## **Journals**

Students will complete journal entries related to environmental current events, data interpretation and analysis, mathematical computations, and the questions at the end of each chapter.

## **Semester Projects**

First Semester: Current Events Journal

- 20 relevant, current environmental science articles taken from newspapers, magazines, or podcasts organized into a three-ring binder with 100-word summary and 150-word analysis for each
- All of the following topics must be addressed
  - o Land usage
  - o Water usage
  - o Biodiversity
  - o Population dynamics
  - o Energy and resources consumption
  - o Pollution

Second Semester: Environmental Legislation Analysis

- Research a piece of legislation related to the environment that was not discussed in class
- Create a multi-media presentation and write a report (2-3 pages) analyzing this legislation

## **Service Learning**

Students will be required to spend time educating others on issues related to the environment.

## Grading

Grades are weighted to give the intended importance to each learning goal and to each assessment. Grades in this class during the semester include assignments and activities in the following categories:

Achievement Factors	75%
Tests, Lab Notebooks, Projects, Essays	
Practice Factors	25%
Homework, Quizzes	

Grades are calculated in the following manner:

A	94.5	C-	69.5
A-	89.5	D+	67.5
B+	87.5	D	64.5
B	84.5	D-	59.5
B-	79.5	E	0
C+	77.5		
C	74.5		

In addition the following grading practices are used:

Extra credit: No extra credit is offered.

Group work: Most often when students work in a group, individual grades will be assessed. Occasionally group work will entail two separate grades, individual and group. The individual grade will be worth more points than the group grade, so that other students' failure to perform does not affect your grade in a significant manner, but that your ability to function as a part of a group is evaluated.

Late work/incomplete work: Late work is not accepted. Work that is incomplete will receive a grade reduction. Exceptions will only be given in cases of extreme circumstances, and students must talk to me in regards to the work immediately for an exception to be considered.

Makeup/redo: Work missed due to an excused absence must be turned in within two school days of the last missed day.

## **Classroom Expectations**

Students will have the necessary materials with them in class, every class. This includes a writing implement, the text we are studying, and homework.

**Tardiness:** You are expected to be on time every day; tardiness is unacceptable. Your tardiness will be paid back 10-fold. For each minute you are tardy, you will stay after school for 10 minutes. Times are always rounded up to the nearest minute. For example, if you arrive five seconds after the bell finishes ringing, that equates to one minute late, and 10 minutes after school. If you arrive two minutes and ten seconds after the bell finishes ringing, this would be three minutes late and would result in thirty minutes after school. Obviously, if you enter class after the bell with a legitimate pass, the penalty will be waved.

**Class behavior/policies:** All students are expected to behave as responsible adults. Our classroom is an environment of learning. We will respect all people and all opinions in our room. Students will treat others and their belongings with respect. Students will respect the teacher and the classroom space. Students will come to class prepared to work and be successful. All students will adhere to the student code of conduct. Our classroom is an environment of learning. No derogatory or offensive language will be used.

You are responsible for getting work if you missed a class, I will not gather your work for you.

**Passes:** Being in class is crucial to success. Passes will only be given on a limited/emergency basis.

**Possession of Non-Academic Materials:** Any materials that you possess that are not used for an academic purpose are banned from the classroom. These items include, but are not limited to: laser pointers, cell phones, pagers, blackberry devices, personal video games, rubber bands, and cameras.

Mistakes in record keeping can occur. Hence, you should keep all work from class. This will also help you to prepare for the final exam.