

AP Environmental Science Course Syllabus 2016-17



Instructor: Mrs. Laurie Rogers

Contact Information:

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Available hours: I am available most mornings from 7:40 to 8:10am, and Tuesdays after school until 4:30, and other days when I do not have a club meeting. If you need help, please just ask me to arrange a convenient time!

Course Description:

AP Environmental Science is designed to prepare students for the College Board AP Environmental Science Exam. The goal of this inter-disciplinary course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. Students are taught methods for analyzing and interpreting experimental data and for identifying and analyzing environmental problems both natural and man-made. Students learn how to evaluate the relative risks associated with these problems, and to identify sustainable solutions for resolving or preventing them. This course adheres to the objectives instituted by the College Board for all AP Environmental Science. The following themes provide a foundation for the structure of the AP Environmental Science course:

- Science is a process
- Energy conversions underlie all ecological processes
- The Earth itself is one interconnected system
- Humans alter natural systems
- Environmental problems have a cultural and social context
- Human survival depends on developing practices that will achieve sustainable systems.

Laboratory/Fieldwork:

The course includes laboratory/field investigation components constituting a minimum of 20% of instructional time (minimum 1 class per week). Through a variety of laboratory work and field investigations, students learn methods for data collection, the application of mathematical analysis and experimental data interpretation. Students will discuss and debate possible resolutions and sustainable ways in managing the environmental problem and will make connections to other concepts. Students are required to read and sign the lab safety contract and follow all safety protocols. Students may have 1-3 labs in process at any time. Students are encouraged to keep copies of their laboratory work for use in determining college credit (<http://apcentral.collegeboard.com>).

Text Book:

The textbook used is *Living in the Environment: Principles, Connections, and Solutions, 15th edition*, by G. Tyler Miller, Jr., 2007, Belmont, CA: Thomson Brooks/Cole/Cengage Learning. (Replacement cost: \$100)

Primary Supplemental Materials:

Various news/magazine/journal articles, videos, case studies, relevant internet sites, additional textbooks for reference, lab manuals, and non-fiction books related to environmental science, guest speakers

Course Materials:

Students are required to have a 3-ring binder with 5 dividers, index cards, writing utensils, graph paper, a composition book for lab data & flash drive.

Course Content:

The course provides instruction in each of the following seven content areas outlined in the Course Description. The percentage after each topic indicates the approximate proportion of multiple-choice questions on the exam and thus the relative emphasis that will be placed on the topics in this course:

- Earth systems and Resources (10-15%)

- The living world (10-15%)
- Population (10-15%)
- Land and Water Use (10-15%)
- Energy Resources and Consumption (10-15%)
- Pollution (25-30%)
- Global Change (10-15%)

This course will prepare all students to take the AP Environmental Science Exam on May 1, 2017. The three hour long exam will be divided between a Multiple Choice and a Free Response Section. The multiple choice section consists of 100 questions and constitutes 60% of the final grade. The free response section emphasizes the application of the principles to a greater depth and comprises 40% of the exam grade. The major content areas of the course will be addressed through lectures, labs, activities, case studies, class discussions and debates, cooperative groups, internet searches, assigned readings, guest speakers and outdoor fieldwork.

Course Assessment Methods

- **Tests / Quizzes:** Tests will be given approximately every 2-3 weeks at the end of each unit or partial unit (1-3 chapters) and will consist of timed multiple choice and free response essay questions. Tests will be worth 100 points. Calculators WILL NOT BE ALLOWED on tests. Quizzes will be given periodically to assess understanding of material. Homework may also be addressed with homework quizzes.
- **Laboratory / Field Reports:** To include both short and long term labs. Lab assignments will be turned in for credit either as a formal written lab report (minimum of 2 per semester) or informally as a lab handout either as an individual or group. Labs should be kept organized to use as evidence of laboratory work should colleges request this in order to determine appropriate credit.
- **Projects / Presentations:** To supplement and extend content covered in class, students will work on group and individual projects, such as presentations, posters, models, etc., that may count as a test or quiz.
- **Homework / Class work / Participation:** Textbook readings, chapter outlines, note taking, focus questions, FRQs, flash cards, journal entries, practice mathematical calculations, and various assignments as deemed necessary by the instructor. Math competency without the use of a calculator is necessary. Students must show all work, including units, and be proficient with scientific notation, conversions and dimensional analysis.

Additional Course Requirements:

- **Summer Assignment:** Posted on School Website (math & vocabulary review, photo assignment, video)
- **Vocabulary & Laws:** Students will create flashcards to define vocabulary terms/environmental legislation
- **Semester Outing Project:** Attend one environmental outing of your choice, alone or with a group. The outing must involve volunteerism or cleanup to help improve the environment in some way. An individual summary (one page) of the experience must be submitted 15 days prior to the end of each semester.

Fulton County Grading Scale

A = 90-100
B = 80-89
C = 70-79
F = 0-69

Grade Determination (Weights)

Tests / Projects	45%
Labs	20%
Quizzes	10%
Homework	10%
Final Exam	15%

Home Access / Grades

Students are expected to keep track of their grade in the course using Home Access. Students are responsible for ensuring that they remain in good academic standing in the course, and making every effort to improve their grade should their grade fall below a 74%

Classroom Expectations

Students are expected to be courteous, responsible, respectful of fellow students and the teacher as well as instructional time in class, and to strive for personal growth and academic achievement. Excellent attendance is required. Students are expected to follow all school rules and behavior guidelines and all rules outlined in the Safety Contract during laboratory and field work. Your cell phone may only be used during class at the discretion of Mrs. Rogers. At all other times your cell phone should be set to SILENT and stowed in your backpack. During tests, quizzes, exams phones

will be required to be turned off and placed in a designated location. Water bottles are allowed in class, but food is not except at designated times. Correction of student misconduct will be according to Northview and County policies.

Make-Up Work Policy

Students must be prepared to make up tests and or turn in assignments the day upon returning from an absence. It is the responsibility of the student to obtain work missed due to absences. Following excused absences, a student will have an equivalent number of days to complete classwork and/or homework missed during the period of absence. If students are absent they are expected to either email the instructor or network with a classmate to find out what they have missed so that assignments may be turned in on time. Upon returning from an absence, students must pick up assignments from the missed work binder and get notes from a reliable classmate. If a student has missed a lab, they must arrange a time to make it up within one week. Make-up tests/quizzes may be different from the original test/quiz. Students should make every effort to be present on test dates.

Late Work Policy

For projects and formal lab reports, students will receive a deduction of 20% for each day past the original due date of the assignment. If students are not prepared to present a project/lab on the date assigned, they will lose any presentation points possible in addition to the late deduction. Individual exceptions to this policy may be obtained by a written doctor's note or through the teacher's discretion. Late homework is accepted the next day for 50% credit.

Fulton County Recovery Policy: Recovery is for students who, despite a conscientious effort and communication with their teachers, have failed to demonstrate satisfactory understanding of course goals. It is not for the student who has been failing for many weeks and then wishes to recover during the final days of the course. Opportunities for students to recover from a 74 or below cumulative average will be provided when all work required to date has been completed and the student has demonstrated a legitimate effort to meet all course requirements. Students who have not attempted to complete all course requirements are not eligible for recovery. Students may initiate recovery on major assessments starting with the second major assessment of the semester as long as they have made a legitimate effort to meet all course requirements including attendance. Unexcused absences may prevent this opportunity. So that students stay focused on the content at hand and don't become overwhelmed and fall too far behind, they must initiate recovery on a major assessment within five school days of being informed of the grade on that assessment. Recovery work must be completed within ten school days prior to the end of the semester. The nature and type of recovery assignment is given at the discretion of the teacher.

Academic Integrity and Plagiarism

All students are expected to abide by the Northview High School Academic Integrity Policy as outlined in the student handbook. Cheating and plagiarism are considered violations of the NHS Honor Code and will not be tolerated. Students must cite all informational resources and pictures used in all presentations/projects. Any information used must be put into the student's own words. **An honor code violation in any form will result in a ZERO for the assignment, no opportunity to make up the work, and an administrative referral in accordance with the NHS Honor Code.**

Course Outline Below is a general outline of the major concepts to be covered over the course of the year. While much of the material will be covered in class through lecture and lab activities, it is essential that students read the text and assigned readings thoroughly, as the breadth of this course covers more material than be covered during class. Global Economics is woven as a thread through all topics covered during the year (Chapters 24, 25, 26) and covers topics such as cost-benefit analysis, externalities, marginal costs, sustainability, Globalization, World Bank, Tragedy of the Commons, politics and ethics. Relevant laws and treaties are to be included with each unit.

Unit	Theme	Topics and Concepts	Chapters
1	Course Overview: Principles & Concepts	<ul style="list-style-type: none">• <u>Intro to APES</u>: Background & general overview, discussion of our current environmental situation• Review of basic chemistry, matter and energy laws, math concepts and experimental design	1 & 2
2	Ecosystems, Matter	<ul style="list-style-type: none">• <u>Ecosystem Structure</u>: Ecosystem structure & components, populations and communities, ecological niches, species diversity	3 & 4

	Cycling, Evolution & Diversity	<ul style="list-style-type: none"> • <u>Energy Flow</u>: Photosynthesis and cellular respiration, food webs and trophic levels, ecological pyramids. • <u>Ecosystem Diversity</u>: Biodiversity, natural selection, evolution, origin, niches, adaptations, ecosystem services • <u>Natural Biogeochemical Cycles</u>: Carbon, nitrogen, phosphorus, sulfur, water, conservation of matter 	
3	Community Ecology & Biodiversity	<ul style="list-style-type: none"> • <u>Biomes</u>: climate, major terrestrial and aquatic biomes, interactions among species • <u>Natural Ecosystem Change</u>: Climate shifts, species interactions and movement, ecological succession and sustainability, community ecology 	5, 6, & 7
4	Population	<ul style="list-style-type: none"> • <u>Population Biology Concepts</u>: Population ecology, carrying capacity, reproductive strategies, survivorship • <u>The Human Population and Its Impact</u>: Human population dynamics, historical population sizes, distribution, fertility rates, growth rates, demographic transition, age-structure diagrams, strategies for sustainability, impact of population growth 	8 & 9
5	Land, Agriculture, & Mining	<ul style="list-style-type: none"> • <u>Soil and Soil Dynamics</u>: Soil formation & profiles, composition, types, physical and chemical properties, erosion, soil conservation • <u>Agriculture</u>: Food production, security and nutrition, GMOs, irrigation, deforestation, pesticides and pest control • <u>Earth Science Concepts</u>: Plate tectonics, earthquakes, volcanism, weathering, rock cycle, rocks & minerals, seasons, solar intensity, latitude • <u>Mining</u>: Mining methods, global reserves, relevant laws and treaties 	3 (part), 13, 15
6	Water & Water Pollution	<ul style="list-style-type: none"> • <u>Global Water Resources and Use</u>: Freshwater/saltwater, ocean circulation, use & shortages, surface/groundwater issues, irrigation, global problems, conservation • <u>Water Pollution</u>: Types, sources, causes/effects, eutrophication, groundwater pollution, maintaining water quality, water purification, sewage treatment 	14 & 21
7	Atmosphere, Air Pollution & Climate Change	<ul style="list-style-type: none"> • <u>The Atmosphere</u>: Composition, Weather and climate, atmospheric circulation, atmosphere-ocean interactions • <u>Air Pollution</u>: Sources, major air pollutants, measurement units, smog, acid depositions, heat islands, indoor air pollution, remediation and reduction strategies • <u>Stratospheric Ozone</u>: Formation of stratospheric ozone, causes & effects of ozone depletion, strategies for reducing depletion • <u>Global Warming</u>: Greenhouse gases, impacts and consequences of global warming, reducing climate change 	19 & 20
8	Energy Resources and Consumption	<ul style="list-style-type: none"> • <u>Energy Concepts and Consumption</u>: past, present and future energy needs • <u>Fossil Fuels and Nuclear Energy</u>: Formation of coal, oil, natural gas, extraction/purification methods, world reserves & global demand, synfuels and environmental concerns, nuclear power & safety, health & waste issues • <u>Hydroelectric Power, Energy Conservation and Renewable Energy</u>: Dams, flood control & impacts, energy efficiency, hybrid vehicles, mass transit, advantages and disadvantages for all renewable forms of energy 	16 & 17
9	Sustaining Biodiversity	<ul style="list-style-type: none"> • <u>Global change</u>: Sustaining Terrestrial, Species and Aquatic Diversity • <u>Forestry and Rangelands</u>: Forests, forest fires, forest management, national forests, overgrazing, deforestation, desertification, rangeland management • <u>Loss of Biodiversity</u>: Habitat loss, overuse, pollution, introduced, endangered and extinct species, maintenance through conservation • <u>Fishing</u>: Fishing techniques, overfishing, aquaculture, fisheries management 	10, 11, 12
10	Impacts on Health & the Environment	<ul style="list-style-type: none"> • <u>Hazards to human health</u>: risks and toxicology • <u>Solid Waste</u>: Types of hazardous waste, treatment/disposal, clean-up of contaminated sites, biomagnification, reduction, landfill design, recycling 	18, 22
11	Urban Land Use	<ul style="list-style-type: none"> • <u>Urban Land Use</u>: Urban development, transportation infrastructure, public and federal lands, land conservation options, sustainable land-use strategies • <u>Noise Pollution</u>: Sources, effects, control measures 	23
12	Exam Prep	• Exam Review and Post-AP Exam project	