

Dr. Stephanie Katz

Environmental Science Syllabus • 2009-2010

- skatz@lindenhall.org • www.chemkatz.com •

Course Philosophy: This course is an introduction to Environmental Science: the study of the interactions between living and non-living things. Through hands-on activities and explorations you will have the opportunity to discover how you are part of a special environmental puzzle, the likes of which you haven't even begun to imagine. We will focus on the relationship between the various parts of our dynamic environment and the current environmental issues we face in the 21st Century.

Course Requirements:

- **Textbook:** Arms, K. *Environmental Science*, 2006, Pearson, ISBN: 0-03-066174-9
- **Required Materials:** One 1", 3-ring binder with loose-leaf notebook paper and dividers; scientific calculator; blue or black pens and/or pencils; and bound Composition book notebook
- **Optional Materials:** pocket folders or other organizational folder system; colored pens (for taking notes); and highlighter pens (for taking notes).

Grading Procedure: Grades are based on a combination of tests, quizzes, writing assignments (including lab reports), and projects. The point value of each assignment will indicate its relative weight during each trimester. The trimesters and exams are weighted as described in the Student Handbook: "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: You will receive a **percentage grade** in this class, using the following method:

$$(\text{Total points earned} \div \text{total points possible to earn}) \times 100\% = \text{your percentage grade}$$

This percentage will be translated into a **letter grade** using the following scale, as dictated by school policy:

A- to A+: 90-100
B- to B+: 80-89
C- to C+: 70-79
D- to D+: 60-69
F: 0-59

Coursework Policies:

We will discuss individual assignments as they arise. However there are some general policies that are common to all assignments.

1. All assignments are due **at 4:00 PM** on the due date. This policy encourages students to come to class on the day an assignment is due and ask questions on parts of the assignment she does not understand. This also allows students to attend Academic Help the day an assignment is due and finish the assignment after hearing other students' questions in class.
2. Late assignments may be subject to a **50% grade penalty** especially assignments that are not submitted on the due date by 4:00PM. According to the Student Handbook, "Short-range

assignments, like daily homework, for example, should be completed by arranging for Academic Help time ***on the day it was due and not turned in*** by coming to the teacher to complete the assignment. If the student does not come for Academic Help on the day of a missed homework assignment, then she must come the next day; point deduction for late work at this time should be at the discretion of the teacher. If the student does not report on the second day for Academic Help, then this action is considered a cut and will be followed by a pink slip.” Therefore, while I will not *usually* deduct 50% for a late assignment, the school policy allows me to decide how many points to deduct, and it is possible I may deduct up to 50%. Excused absences represent an exception to this late policy, so please make sure that you let me know if you have a valid reason for being absent, including the proper documentation to accompany your absence. Additional exceptions are allowable but will be discussed on a case by case basis. Please always feel free to discuss with me your reasons for submitting a late assignment, but always do so in a respectful matter. Also know that while I will ALWAYS accept late work, I will be the judge and jury about what late points will be deducted. If you feel that you will be unable to submit an assignment on time, it is best if you discuss it with me BEFORE the due date!

3. All assignments are to be submitted into my INBOX, which is located at the front of my classroom. Once you place your assignment into the INBOX, ***you*** are not permitted to remove your assignment from the INBOX for any reason. If you need to retrieve an assignment that you previously submitted, ***you should ask me*** to retrieve the assignment for you. This policy protects everyone's assignments. Please submit your assignment into *your class period's* INBOX, i.e. place your assignment in the INBOX marked Environmental Science.
4. PRIOR APPROVAL IS REQUIRED (from me and only me) if you are going to submit an assignment via email. You may only email an assignment that has been okayed by me in advance.
5. Assignments should be submitted with the name of the assignment, your full English name, class name, period, and date (e.g. Experiment 1, Susie Student, Env. Sci, Per G, 8/30/09) PRINTED at the top RIGHT corner of your paper UNLESS if there is a designated space for this information elsewhere. If I receive an assignment without a student name which I cannot identify by process of elimination or handwriting, I will hang the unnamed assignment on the class bulletin board for the student author to claim; please note, assignments received without a student name subsequently turned in the following day may be subject to a late penalty.
6. Handwritten assignments should be completed in either BLUE or BLACK ink or PENCIL only. Other colored pens should NEVER be used. When you are instructed to correct your own assignment, RED pen should be used for corrections.
7. Your work must be legible or it will not receive a grade. Unless otherwise specified, you are permitted to type assignments if you feel that your handwriting is illegible.
8. Missed work, labs, and tests must be made up in accordance with Linden Hall policy. Please note...it is your responsibility to obtain work missed due to absence, regardless of whether it is an excused or unexcused absence! Please consult your classmates, the in-class bulletin board, my webpage, or simply ask me for the assignment when you miss class. If you know, in advance, that you will be absent, please let me know as soon as possible, especially if you are going to be absent the day of a test or quiz.

Classroom Policies:

1. **General Expectations** – Your Bound composition book and textbook will be kept in the classroom except on days you are assigned HW in your book. You should bring your 3-ring

notebook *and* Laptop computer (Netbook) to class every day. You will be taking notes directly into your Netbook or your notebook, whichever is most comfortable for you; however we will often access websites, guided notes or Power Point presentations electronically. If you prefer to print PowerPoint slides or other electronic resources and bring them to class, they will be made available to you on my website ahead of class time.

2. **Staying informed** - My webpage (www.chemkatz.com) is updated on a regular basis to keep pace with the flow of the class. Students are expected to access my webpage **daily** to stay abreast of changes and daily classroom expectations and assignments. If you print out the "Week-at-a-Glance" (WAG) page over the weekend, it may look very different by Tuesday. Your WAG page can be found on the "Click HERE" link on my website. Once you are redirected to the "teacher web" homepage, you will find the WAG page on the #10 Environmental Science link. You may subscribe to my teacher web homepage via the RSS link at the bottom of the teacher web homepage; however, if you do so, you will get updates when I make changes to any and all of my classes. Alternatively you can save the #10 link as one of your favorites and check the WAG page each day to monitor important changes. Our class's agenda will change to best serve your learning needs. You will also notice you can access your grades on the #15 Grades Env Sci link. You will be given an ID number to log in and access your grades. If you or your parents have questions, please contact me via email. Finally, at the top right hand corner of the teacher web homepage, there is an email link (looks like a mailbox) which is the same email at the top of this syllabus. My school voice mail extension is listed on the #1 Dr. Katz link. Voicemail is the place to leave me a voice message; however, email is the best way to reach me! I will check email up until 9pm and then again on the following day; I will usually return email within one day, if possible. I only check voice mail until 4pm and I will usually return voicemail messages within one day if possible.

3. **Class Participation** - Learning is not an individual endeavor. Therefore, class cooperation is an essential component of the learning environment. Each marking period, you will be assessed on your class cooperation by my subjective evaluation of your ability to work effectively with your classmates and contribute to class discussions. Class participation will be assessed as part of your effort grade.

4. **Safety in the Laboratory** – Safety is everyone's responsibility. We will be performing many experiments in this class that pose potential safety risks. The risks will be significantly minimized by using common sense precautions and following the appropriate safety rules. You will be expected to read, learn, and sign a two-page safety contract (found on the #5 Handouts link) before you perform any experiments in my class. Your signature on this safety contract is a promise to me and your classmates that you will take all precautions necessary to keep the lab environment hazard-free. Your parents or guardians (dorm parents will suffice) are also expected to sign the safety contract because it is important that they are aware of the potential risks you may encounter and that you are being tasked with the responsibility of following these safety rules. Please have your parents read and sign both pages after you have read and signed both pages of the contract. Once you and your parents have both read and signed it, please promptly return it to me.

5. **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.

6. **Honor Code** – Students are expected to uphold the Linden Hall Honor Code. While students are often encouraged to work collaboratively, there are unequivocal differences between collaboration (working together when I allow you to) and collusion (working together when you're not allowed to). Intentional acts of plagiarism or other types of academic dishonesty will be met with firm consequences as outlined in the Student Handbook.

7. **Labs** – We will be performing a variety of laboratory experiments throughout the year. You will receive a separate handout explaining your lab requirements and the lab report format. You will be notified in advance on the day we perform a wet lab involving chemicals. On these days you are required to wear long pants and closed toed shoes for safety reasons.

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	
19-20	Mid Year Eco Project	Supplemental Resources
21	Ecosystems: Everything is Connected	Ch. 4
22	The Diversity of Living Things	Ch. 4
23	Energy Flow in Ecosystems	Ch. 5
24	Review/ Mid-Year Exams	Ch 1-5, 11-13, 17-18
25	Cycling of Materials	Ch. 5

26	What is a Biome/ Forest Biomes	Ch. 6
27	Grassland, Desert, and Tundra Biomes	Ch. 6
28	Freshwater Ecosystems	Ch. 7
29-30	Spring Break	
31	Marine Ecosystems	Ch. 7
32	Land Use/ Water Use and Pollution	Ch. 14, Ch. 11
33	Feeding the World/ Human Population Growth	Ch. 15, 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	

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