

ENSC 1: Introduction to Environmental Sciences

**2:30-3:45 pm T/R, Billings-IRA Allen
LH**

Fall 2014

Instructor: Stephen Posner

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Grader: Eliese A. Dykstra (eliese.dykstra@uvm.edu)

Course Objectives: ENSC 1 is designed to help you learn the following:

1. The basic concepts, language, and principles of environmental science.
2. How ecosystems function and how human activities affect ecosystem processes in air, on land and in water.
3. How to interpret environmental data and think critically about complex environmental issues.
4. Addressing the root causes of environmental problems, as well as green actions and practices that can be part of the solution.
5. How to transition to a sustainable society that seeks balance between human and ecological needs.

Key Concepts: systems thinking, critical analysis, sustainability

Course Description:

ENSC 1 is designed for students interested in learning how the environment works. It will introduce you to the environmental sciences, explore how humans affect ecological systems, and demonstrate how scientific knowledge and principles can help solve environmental problems.

We'll begin the course with a brief review of the scientific method, how ecosystems work, and the basics of global population growth. Then we'll consider sources of pollutants and their impacts on global resources. We'll conclude the course by reviewing relevant environmental laws and management practices, examining steps we can all take to better protect our environment.

Textbook: Chiras, D.D. 2012. *Environmental Science*. 9th Edition. Jones and Bartlett Publishers. 637 pp.

Course Grading:

Quizzes: 4@5% each	20%
Homework assignments: 5@ 5% each	25%
Midterm examination: Thursday, Oct 9	25%
Final examination: Tuesday, Dec 9	30%
Total	100%

Quizzes and Examinations: The quizzes will be unannounced and given in class. You may work in groups of 2 or 3 on quizzes if you'd like. All students in a group receive the same grade.

The midterm and final examination will consist of multiple choice, true/false, fill in the blank and free response questions.

NOTE: If you have a valid reason for missing class, you may make up quizzes only if you notify me beforehand.

Homework Assignments: During the semester, you'll have five homework assignments. All assignments will be due on **Friday at noon** the week they are assigned. The due dates of assignments are posted on the syllabus, and the details of each assignment will be posted on Blackboard.

Submitting Homework Assignments: Assignments will be made available as a Word document via Blackboard. Follow these three easy steps.

- 1) Go to <http://bb.uvm.edu>, find the course, click on "Assignments" on the menu at left.
- 2) To complete an assignment, download the Word document and respond to questions in the document.
- 3) To submit the assignment, save it as a Word document with the file name *lastname_firstname_ENSC1_assignment#* and upload through Blackboard. For example, for assignment 3 I would upload a file called *Posner_Stephen_ENSC1_assignment3.doc*

NOTE: No late assignments will be accepted.

Extra Credit: There will be opportunities to earn extra credit during the semester.

Topic Outline

Note: Subject to change

August 25, week 1: Introduction (Ch. 1, pp. 1-13)

- Course introduction and outline
- What is “Environmental Science?” The Scientific Method
- Systems thinking and critical analysis

September 2, week 2: Ecosystem structure and function (Chs. 4 & 5, pp.50-95)

- ABCs of ecology
 - Ecological functions and structure
 - Biomes
 - Aquatic Life Zones
- ASSIGNMENT #1 DUE SEPTEMBER 5th at NOON: The Scientific Method**

September 9, week 3: Ecology and Human Ecology (Chs. 6 & 7, pp. 96 – 133)

- Homeostasis
- Natural succession and evolution
- Human impacts on ecosystems
- Cultural and biological evolution
- PRP model

September 16, weeks 4: Human population (Chs. 8 & 9, pp. 134-166)

- ABCs of population
 - Types and rates of population growth
 - The demographic transition
 - Keys to future growth
- ASSIGNMENT DUE #2 SEPTEMBER 19th at NOON: Math Exercises**

September 23, weeks 5: Community development and environmental protection (Ch.17, pp.365 – 383)

- Cities and towns as networks
- Land use planning
- Sustainable transportation system

September 30, weeks 6: Air quality and noise pollution (Chs. 19 & 20, pp. 410-467)

- Traditional air pollutants
- Global climate change

Ozone depletion

Indoor air quality and noise pollution

ASSIGNMENT #3 DUE October 3rd at NOON: Carbon Budget and Ecological Footprint

October 7, week 7: MIDTERM in class on October 9th

Midterm Review

October 14, week 8: Water resources and water quality (Chs. 13 & 21, pp. 245-277, and 468-495)

Hydrological cycle

Water supply

Wetlands, estuaries, coastlines and rivers

Water pollution: ground and surface

Water pollution control

Integrated Water Resources Management

October 21, week 9: Biodiversity (Ch. 11, pp. 194-220)

What is biodiversity?

Importance of biodiversity to humans

Threats to global biodiversity

Efforts to protect biodiversity: ESA and global “hot spots”

ASSIGNMENT DUE #4 OCTOBER 24th at NOON: Water Resources Management Case Study

October 28 and November 3, week 10-11: Human impacts (Chs. 10, 12 & 23, pp. 167-193, 221-244 & 519-545)

ABCs of soils

Traditional vs. sustainable agriculture

Biofuels vs. GMOs

Forestry and the environment

Global issues: desertification and tropical rainforest loss

Solid waste disposal

November 10, week 12: Sustainable Economics and Development (Chs. 25 & 26, pp. 560-602)

An ecological perspective of economics

Growth and development

Natural capital and the science of ecosystem services

The interface of environmental science and policy

ASSIGNMENT DUE #5 NOVEMBER 14th at NOON: Literature Review Exercise

November 17, week 13: Energy and mineral resources (Chs. 14-16, pp. 275-364)

- Energy ABCs
- Non-renewable energy sources
- Renewable energy
- Our energy future
- Mineral resources

November 24, week 14: NO CLASSES!!! Thanksgiving Recess

December 2, week 15: A look ahead (Chs. 2 & 3, pp. 14-33 & 34-49)

- Environmental regulations: important federal laws
- Living sustainably: reducing our environmental footprint
- Leverage points for change
- Course wrap-up and evaluations

FINAL EXAM

Details TBD. Tentatively scheduled for December 9th, 7:30am -10:15am, Billings Lecture Hall

Academic honesty: You are expected to maintain a high standard of academic honesty. Please read about UVM's Academic Honesty Policy in the **Cat's Tail**. Be particularly careful to avoid plagiarism when working on written assignments.

Religious holidays: You have the right to practice the religion of your choice. Each semester, you should submit in writing to your instructors by the end of the second full week of classes your documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observances to make up this work.

Classroom etiquette:

1. Please **do not talk** during class (except when called upon!). Talking during class distracts me and your classmates.
2. Once in class, please remain seated; if the class decides it needs a brief break, I can arrange that.
3. Please be on time; late arrivals are distracting to all.
4. Please turn off cell phones and don't text, facebook, twitter, etc. during class.
5. Have fun and send me feedback.