

ENVIRONMENTAL HEALTH
ENVR 521/321

Course Description: Discusses health effects of environmental (biological, physical, and chemical) hazards and the design of environmental controls and regulations for the health and well-being of humans. Environmental Health will provide the student with information on the more immediate environmental health issues, and on the long-term needs of the laboratory and field worker.

Prerequisite: TDEC 122 or equivalent.

Credits: 3 – 0 – 3

Required Text: Our Global Environment, A. Nadakavukaren, Waveland Press

Recommended Texts: Any Environmental Chemistry text.

Course Objectives: At the end of the course, the student will have acquired competence that will:

- 1) Include practical and applied knowledge and skills;
- 2) Include theoretical basis for problem solving;
- 3) Supply preparation for independent research projects;
- 4) Supply the background needed for employment in today's demanding market;
- 5) Provide the communication skills needed to communicate simple and complex scientific data and conclusions not only to the peer group, but to management with no science backgrounds;
- 6) The learning of a broad basis of environmental issues;

These skills will be achieved through lectures, field trips and guest seminars.

Topics covered:

- 1) **Introduction to Ecological Principles**
 - a. Ecosystems.
 - b. Limiting Factors & Limits of Tolerances.
 - c. Relevant government safety standards.

- 2) **Environmental Disease**
 - a. Mutation.
 - b. Birth Defects.
 - c. Cancer.
 - d. PCBs
 - e. Dioxin
 - f. Asbestos

- g. Lead
 - h. Mercury
 - i. Cadmium
- 3) **Pests & Pesticides.**
- a. What is a Pest?
 - b. Problems Caused by Pests & Pest Control.
 - c. Environmental Impact of Pesticide Use.
 - d. Hazards of Human Health.
 - e. Alternatives to Chemical Pest Control.
- 4) **Radiation.**
- a. Ionizing Radiation.
 - b. Health Impact of Ionizing Radiation.
 - c. Ultraviolet Radiation.
 - d. Microwaves.
- 5) **Atmosphere**
- a. Composition.
 - b. Human Impact.
 - c. Depletion of the Ozone Layer.
 - d. Rising Levels of Atmospheric CO₂.
 - e. Impacts on Global Warming.
 - f. Greenhouse Policy Debate.
- 6) **Air Pollution**
- a. Sources of Air Pollution.
 - b. Impact of Air Pollution on Human Health.
 - c. Pollution Control Effects – The Clean Air Act.
 - d. Global Air Quality Trends.
- 7) **Noise Pollution**
- a. Sources of Noise.
 - b. Noise as a Nuisance.
 - c. Nature of Sound.
 - d. Noise & Hearing Loss.
- 8) **Indoor Air Pollution.**
- a. Sources of indoor air pollution
 - b. Interior design and indoor air quality.
 - c. “Sick Building” syndrome.
 - d. Handling indoor air pollution issues.
 - e. Building codes.
- 9) **Water Resources**
- a. Hydrologic Cycle.

- b. Water Supply: Our Next Crisis?
- c. Water Management: Increasing Supply vs. Reducing Demand..

10) Water Pollution

- a. Controlling Water Pollution: The Clean Water Act.
- b. Sources of Water Pollution.
- c. Municipal Sewage Treatment.
- d. Septic Systems.
- e. Industrial Discharges.
- f. Water Pollution and Health.
- g. Looking Ahead.

11) Solid and Hazard Wastes.

- a. Waste Disposal – A Brief History.
- b. Municipal Solid Wastes (MSW).

In addition to a Midterm and a Final, each student will be expected to make an oral presentation on a topic of her/his choice and to submit a written report on the same topic. A one page review of each seminar or field trip will also be required.

Homework will be assigned and reviewed. The homework problems will supply the basic examination questions.

Field Trips are being scheduled for visits to one or two of the following:

1. the environmental handling systems of a local institution;
 2. a Hazardous Materials Response team;
 3. a Superfund site;
 4. a pharmaceutical firm's safety team.
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Guest lectures will be chosen from experts in the fields of:

1. laboratory ventilation;
 2. hazardous materials handling [EPA];
 3. fire codes in Philadelphia [Philadelphia Fire Department]
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Grading

Reports (2): 750 – 1000 words. Due one week after each seminar/trip. **20%**

Library Report: 750 – 1000 words. Using the syllabus as the major source of topics, focus on an area of your particular professional background or interest. Written report due August 18th. **10%**

Verbal report: A 10 – 15 minute verbal presentation of this report will be given during the week of your choice. **5%**

Exams: Midterm & Final: Exams will be based on homework & on Lectures. **60%**

Homework: Weekly Assignments: Taken from the study guide. Turn In upon entering the classroom. **5%**

Total: 100%

Exam Policy:

There will be no make-up for exams, laboratories, field trips or seminars. All potential Schedule conflicts must be discussed in advance. A make-up exam will be given ONLY if Arrangements were made in advance, or unless there is a medical or family emergency as approved by the instructor.

Code of Conduct:

Academic Honesty is required. It is assumed that students in this course are mature and responsible adults. Charges will be brought against any student violating the student Code of Conduct and will be referred to the appropriate disciplinary committee. Plagiarism and cheating are especially prohibited. Quotations and opinions of other authors may be cited or they must be rewritten in one's own words.

