UNIVERSITY OF MINNESOTA
School of Public Health

Summer Session 2005

June 13 – August 12, 2005

COURSE SYLLABUS
PubH 5103, Exposure to Environmental Hazards- (On-line version)

Credits: 2.0

Course meeting times:	June 13-August 12, 2005, at http://webct.umn.edu
Instructor:	Lead Instructor: Craig Hedberg
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I. Course Description

This course explores the concepts, assessment, and control of exposure to biological, physical and chemical hazards in the environment, placing these in the context of the multi-disciplinary scientific field of environmental health as an essential component of the wider field of public health. The course is comprised of lectures, examples, group discussions, and group presentations.

This course is one of three “core” courses designed to give students in the environmental health masters program a background in the important concepts of exposure, health effects (PubH 5104), and decision-making (PubH 5105).

II. Learning Objectives

This course will provide a basic context for understanding environmental health issues. It will describe various physical, chemical, biological and behavioral exposures; their sources, occurrence, pathways, and receptors. The course will explore strategies for control based on interactions between the agent, host, and environment.

At the end of this course the student will be able to:

1. Demonstrate knowledge about the sources, and nature of exposure to potentially harmful agents
2. Integrate that knowledge into the larger context of environmental health and public health
3. Identify options for intervention strategies
4. Apply the knowledge-based conceptual skills developed to the understanding of practical "real-world" problems
5. Demonstrate the ability to express what has been learned in a quantitative manner
6. Appreciate the similarities and differences in exposure concepts across disciplinary boundaries
7. Articulate what has been learned through effective oral and written communication.

III. Methods of Instruction and Work Expectations

The course is taught on-line and is comprised of lectures, exercises, critical reviews of literature, group discussions, and group presentations. On-line discussions will be focussed on current events submitted during weeks 2-8, and how they relate to the course subject material. There will be three written quiz and a final examination. The total points available will be 100 points, distributed as follows:

3 quizzes	15 points
Final examination	10 points
3 exercises	15 points
Group project	25 points
Discuss current events	10 points
5 article critiques	25 points

Reading assignments, lectures, exercises and critical reviews will be released on a weekly schedule, listed below.

IV. Grading

1. **Grading Criteria**: This course is offered A/F or S/N.

- A/F letter grade will be determined by total effort as follows:

A = 95-100%	(4.0) Represents achievement that is outstanding relative to the level necessary to meet course requirements.
A- = 90-94%	
B+ = 87-89%	
B = 83-86%	(3.0) Represents achievement that is significantly above the level necessary to meet course requirements.
B- = 80-82%	
C+ = 77-79%	
C = 73-76%	(2.0) Represents achievement that meets the minimum course requirements.
C- = 70-72%	
F =	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor

	and the student that the student would be awarded an I.

- S/N option must complete all assignments to a C- level (70%):

S	Achievement that is satisfactory will be expected to complete all assignments and receive a minimum of 70% to receive a passing score (achievement required for an S is at the discretion of the instructor but may be no lower than a 70%).
F	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

2. **Grading Option** – Students may change grading options during the initial registration period or during the first two weeks of the term. **The grading option may not be changed after the second week of class.**

3. **Course Incomplete** – An incomplete grade is permitted only in cases of extraordinary circumstances and following consultation with the instructor. In such cases and "I" grade will require a specific written agreement between the instructor and the student specifying the time and manner in which the student will complete the course requirements. Extension for completion of the work will not exceed one year.

4. **Scholastic Dishonesty** – Students are responsible for knowing the University of Minnesota Board of Regents' policy on student conduct and scholastic dishonesty: http://www1.umn.edu/regents/policies/academic/StudentConductCode.pdf

   Scholastic dishonesty as defined in the policy and will be reported to the Office of Student Judicial Affairs http://www.sja.umn.edu/ and will result in a grade of "F" or "N" for the entire course.

   Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas as your own. Serious, intentional plagiarism will result in an "F" or "N" grade for this course. For more information on this policy and for a helpful discussion of preventing plagiarism, please consult University polices and procedures regarding academic integrity: http://cisw.cla.umn.edu/plagiarism/uofmpolicies.html

   Students are urged to be careful that they properly attribute and cite others' work in their own writing. For guidelines for correctly citing sources, go to http://tutorial.lib.umn.edu/. In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course for which you received credit in another course unless by prior agreement with the instructor. Building on line of work begun in another course or leading to a thesis, dissertation or final project is acceptable.

   If you have any questions, consult the instructor.

V. Course Withdrawal

School of Public Health Students may withdraw from a course **through the second day** of the course without permission. No "W" will appear on the transcript. After the second week, students are required to do the following:

- The student must contact and notify their advisor and course instructor informing them of the decision to withdraw from the course.

- The student must send an email to the SPH Student Services Center (SSC). The email must provide the student name, ID#, course number, section number, semester, and year with instructions to withdraw the student from the course, and acknowledgement that the instructor and advisor have been contacted.
- The advisor and instructor must email the SSC acknowledging the student is canceling the course. All parties must be notified of the student's intent.
- The SSC will complete the process by withdrawing the student from the course after receiving all emails (student, advisor and instructor). A "W" will be placed and remain on the student transcript for the course.

After discussion with their advisor and notification to the instructor, students may withdraw until the end of the second day of class. There is no appeal process.

VI. Disabilities

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and Disability Services at the beginning of the term. All discussions remain confidential. For further information contact the University of Minnesota Disability Services website at http://ds.umn.edu/ or call 612-626-1333 (V/TTY).

VII. Course Text and Readings

Course reading will be online.

VIII. Course Outline/Weekly Schedule

Week 1 (6/13/05) Read Healthy People 2010, Chapter 8, Environmental Health, accessible with the following link: http://www.healthypeople.gov/Document/tableofcontents.htm#volume1

Explore and bookmark the following websites:

Environmental Health Perspectives	http://ehp.niehs.nih.gov
EPA	http://www.epa.gov
CDC/NIOSH	http://www.cdc.gov/niosh
CDC/National Center for Environmental Health	http://www.cdc.gov/nceh

Group project assignments

Objectives for lessons:

- Identify multi-disciplinary nature and broad scope of environmental health
- List essential environmental health services
- Identify and discuss key features of major environmental health issues

Introduction. Course content, review of syllabus, student expectations, intro to web site, group assignments. Ten essential services in environmental health. Concepts for organizing the course: agent, environment, and host; hazard recognition, evaluation, and control; source, pathway, and receptor.

"Big picture" issues. Environmental hazards, exposures, and populations at risk. Surveillance, spatial analysis and epidemiology.

Week 2 (6/20/05) Readings to be assigned at end of week 1. Submit and discuss current events

Objectives for lessons:

- Identify sources and nature of exposure to potentially harmful agents associated with food, water, residential environments and hazardous waste
- Understand need for multi-disciplinary approaches to assessing these hazards
- Relate these hazards to broader public health issues

Concepts & issues in environmental hazards: food, water, residential environments, hazardous waste, environmental justice

Week 3 (6/27/05) Article review 1 due, readings to be assigned at end of week 2. Submit and discuss current events. Quiz 1.

Objectives for lessons:

- Identify sources and nature of exposure to potentially harmful agents associated with air, water, and occupational environments
- Understand need for multi-disciplinary approaches to assessing these hazards
- Relate these hazards to broader public health issues

Concepts & issues in environmental hazards: air, water, occupational environments
Chemical and particulate contaminants of air, chemical contaminants of water, air-water interactions.

Week 4 (7/04/05) Article review 2 due, readings to be assigned at end of week 3. Submit and discuss current events. Exercise 1.

Objectives for lessons:

- Define exposure and related terms in context of the environmental health paradigm
- Define important exposure and toxicological terms;
  chemical fate and transport; multi-media exposure (air, food and water); receptors and human exposure pathways, exposure and population activity patterns.
- Understand need for multi-disciplinary approaches to assessing these hazards

Hazard evaluation: basic concepts of exposure:

Week 5 (7/11/05) Article review 3 due, readings to be assigned at end of week 4. Submit and discuss current events. Quiz 2.

Objectives for lessons:

- Define what a biomarker is and identify the characteristics and uses of biomarkers.
- Identify the role of biomarkers in exposure assessment.
- Understand the concept of gene-environment interactions.

Biomarkers

Week 6 (7/18/05) Article review 4 due, readings to be assigned at end of week 5. Submit and discuss current events. Exercise 2.

Objectives for lessons:

- Describe ways to measure and monitor infectious disease hazards and environmental factors associated with their occurrence.
- Identify limitations on measurement and monitoring and how modeling is used to compensate for these limitations.

Hazard evaluation: Measurement, modeling and monitoring; infectious diseases, environmental microbiology, bioterrorism

Week 7 (7/25/05) Article review 5 due. Readings to be assigned at end of week 6. Submit and discuss current events. Quiz 3.

Objectives for lessons:

- Describe the movement of hazards between environmental media.
- Identify limitations on measurement and monitoring and how modeling is used to compensate for these limitations.

Hazard evaluation: Measurement, modeling and monitoring; multi-media exposures

Week 8 (8/01/05) Readings, to be assigned at end of week 7. Submit and discuss current events. Exercise 3.

Objectives for lessons:

- Describe the links between exposure assessments, interventions and exposure limitation standards.
- Identify strategies for controlling exposures to minimize impacts on human health and ecology, basic rationale to assigning options and priorities, roles of technology, education, public policy.
- Discuss examples of environmental interventions.

Exposure standards and interventions to control exposure to environmental hazards

Week 9 (8/08/05) Post and review class presentations. Final exam.

IX. Class Project:

Purpose: To evaluate human exposure from an environmental hazard.

Methods: Groups will be assigned to review published literature and prepare a Power Point presentation summarizing human exposure to a specific environmental hazard. Groups will choose a hazard to evaluate, subject to approval by the instructor.

The presentation should include:

1. Characteristics of agent
2. Fate and transport of the agent in the environment
3. Methods for monitoring the agent in the environment
4. Exposure pathways
5. Methods for measuring human exposure to the agent
6. Strategies for preventing or controlling exposure

Evaluation: Each group will post their presentation on the course web-site during the last week of class.