



**INDIANA UNIVERSITY SCHOOL OF MEDICINE**  
**DEPARTMENT OF PUBLIC HEALTH**  
**Summer, 2009**

**COURSE TITLE:** Environmental Science in Public Health  
**COURSE NUMBER:** P519  
**LOCATION:** IT 167  
**DATE:** Monday, 5:45 – 8:25

**FACULTY:** David McSwane, H.S.D., R.E.H.S.  
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Monday, 3:00 – 5:00

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Meetings by appointment

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**COURSE DESCRIPTION**

The environment influences many aspects of human health and well-being. Many diseases are initiated, promoted, sustained, or stimulated by environmental factors. For these reasons, the interactions people have with their environment are an important component of public health.

Environmental health focuses on the relation between the environment and human health. It encompasses many areas of specialization in the sciences and in one way or another depends on most academic disciplines.

The primary focus of this course will be on pathogenic agents (biological, chemical, and physical) in the environment and their impact on morbidity and mortality of human populations. We will study several types of common and emerging pathogens from anthropogenic and natural sources and how they cause illness and/or injury. Particular attention will be given to the mode of transmission, route of exposure, and acute and chronic diseases or injuries caused by these environmental agents. During the class we will also investigate the strategies, technologies and laws/policies that are used to prevent, control, or eliminate environmental hazards.

### **MPH PROGRAM COMPETENCIES ADDRESSED IN THIS COURSE**

1. Critique ethical, social, cultural, political, economic, historical and legal dimensions of policies and programs which affect the health of diverse populations.
2. Describe environmental, social and biological determinants of health and disease and their political, economic and legal contexts.
3. Make presentations in support of a particular public health proposal using demographic, statistical, programmatic and scientific information.
4. Understand appropriate uses and limitations of both quantitative and qualitative data, and make relevant inferences from such data.
5. Advocate for public health programs and resources.

### **LEARNING OBJECTIVES**

At the conclusion of the course the students will be able to:

1. Explain the man-environment-health interrelationships that formulate man's interaction with his environment.
2. Identify agents in the human residential, occupational and community environment that can cause disease and injury and adversely affect human health and safety.
3. Identify pathways of human exposure to biological, chemical and physical hazards; and explain how these hazards cause acute and chronic diseases.
4. Analyze environmental episodes and determine whether or not an illness is caused or compounded by the synergistic effects of exposure to multiple environmental agents or conditions of human stress and behavior.
5. Describe those environmental control mechanisms that are commonly applied to eliminate or mitigate the adverse health effects of environmental agents.
6. Identify the primary environmental laws and explain how they approach the elimination and control of natural and man-made environmental hazards.
7. Explain how public health professionals from all disciplines and levels of government are working to resolve contemporary environmental health problems.
8. Describe the economic and cultural biases of environment/human interactions.

### **REQUIRED READING**

Howard Frumkin, *Environmental Health: From Global to Local*, Jossey-Bass, San Francisco, 2005, (ISBN 0787973831).

### **SUGGESTED READINGS**

Anne Nadakavukaren, Our Global Environment: A Health Perspective (6<sup>th</sup> edition), Waveland Press, Prospect Heights, Illinois, 2006.

Morgan, Monroe T. Environmental Health, Wadsworth Publishing Company, Englewood, CO, 2003.

Moeller, Dade W. Environmental Health (Third Edition), Harvard University Press, Cambridge, MA, 2004.

Cunningham, William P. and Mary Ann Cunningham, Principles of Environmental Science – Inquiry and Applications (Third Edition), McGraw Hill Publishing Company, New York, 2006.

### **EVALUATION AND GRADING SCALE**

The final grade will be based on the following:

1. Examinations (50%) – A midterm and final examination will be given during the course. The examinations will cover material presented from the text, supplemental readings and class discussion. The final examination will not be cumulative; however, an understanding of material covered previously in the course may be helpful in answering questions on this examination.
2. Research Project and Poster Session (40%) - A research paper and oral presentation are required from everyone in the class. Your research must be on a topic that is germane to the course. However, it is preferable that the topic of your research not substantially duplicate subjects that have been presented in class. Research topics may be local, regional, national, or international in scope.
3. Class Participation (10%) - All students are expected to take an active part in class discussions. Class participation will be based on timely completion of class exercises and activities and attendance throughout the entire class period when student oral research presentations are made during the last two weeks of the course.

### **RESEARCH PAPER GUIDELINES**

Students in the class will form two-member teams for the purpose of researching and writing a report on a contemporary environmental health issue. The instructors will provide a list of potential topics at the first class meeting. Students will be responsible for choosing their own partner for the research project and will select three potential topics for their research from the list of topics provided by the instructors (or another topic of their

choosing) by the second week of class (May 19). The instructors will distribute a list of assigned research teams and topics to everyone enrolled in the class during the third class meeting on May 27.

Each team must submit a one- or two-page outline and preliminary bibliography consisting of at least eight (8) scholarly sources by the fourth class session (June 2nd). No more than four websites may be used as primary sources of information for the research proposal. The research paper should be written using the MLA Style, or equivalent, and consist of at least 10 pages of text (tables, figures, and works cited pages are not included). The research should include, but not be limited to, the following elements:

An analysis of the conditions and circumstances that brought the issue to prominence,

The short- and long-term public health/environmental consequences associated with the issue for the individual and the community,  
An assessment of the individual and community programs that have been implemented to resolve the environmental health issue under investigation

An analysis of the effectiveness of laws, policies and organizations that have been created to prevent, minimize or eliminate the problem or issue under investigation.

All research papers will be due on July 28.

Research reports will be evaluated on the following criteria:

1. Applicability/Timeliness (Is the information presented in the paper current?)
2. Comprehensiveness (Does the research go beyond a simple description of a problem?)
3. Depth of Analysis (Does the research provide an analysis of the causes and effects of the problem and policy as well as the short- and long-term implications for society? Are the conclusions supported by the content of the paper?)
4. Quality of the Report (Does the research paper contain correct grammar and sentence structure?)
5. Quality of the Sources (Is there a sufficient number of sources provided, and are they timely and of acceptable quality?)
6. Quality of the Oral Presentation (Were the key points of the research paper presented in a clear and concise fashion?)

## **ORAL RESEARCH PRESENTATIONS**

Presentations during the concurrent sessions at professional meetings, such as the American Public Health Association and the National Environmental Health Association, are typically very short. As practice for these types of events, student teams will be expected to make 12-minute presentations that highlight their research. During this presentation, the authors are expected to convey the most significant findings of their research to the other members of the class. **Nine minutes will be allotted for the oral presentation with three minutes allotted to each team to respond to questions from the audience.** It is imperative we keep within the allotted 12 minutes to assure that everyone has an equal chance to share their research with the class. Use of PowerPoint slides or equally effective types of visual aids will be expected during the presentation and will be graded as part of the oral presentation.

## **LATE PAPERS:**

Late assignments will not be accepted unless there is a medical or personal emergency, which can be documented. If you must travel out of town, your work must be submitted prior to leaving.

## **ATTENDANCE**

Attendance at classes is expected unless prevented by work, illness, or family emergencies. If you know in advance that you will be unable to attend a class, you should contact the instructors to make them aware of your situation.

## **STUDENTS WITH DISABILITIES**

Students needing accommodations because of disability will need to register with Adaptive Educational Services (AES) and complete the appropriate forms issued by AES before accommodations will be given. The AES office is located in CA 001E and you can reach the office staff by calling 274-3241.

## **STUDENT COURSE EVALUATION**

The Department of Public Health evaluates all courses. Student course evaluations will be conducted in a manner that maintains the integrity of the process and the anonymity of respondents.

## **ACADEMIC INTEGRITY**

Academic and personal misconduct by students in this class are defined and dealt with according to the procedures in the Student Misconduct section of the IUPUI *Code of Student Rights*, <http://live.iupui.edu/dos/code/htm>.

## **CLASS SCHEDULE:**

<u>Date</u>	<u>Topic</u>	<u>Reading Assignment</u>
May 12	Models for studying environmental science and health; principles of ecology: structure, function and change of ecosystems	Text: Chapters 1, 10, and 16

<u>Date</u>	<u>Topic</u>	<u>Reading Assignment</u>
May 19	Environmental health, epidemiology, and Toxicology <b>Research Teams and Potential Topics Due</b>	Text: Chapters 2, 3, 28, 29, 30, 32, 34 and handout
May 26	No class – Memorial Day Holiday	
May 27	Vector-borne diseases <b>CLASS THIS NIGHT WILL MEET IN ROOM 252 OF THE IT BUILDING</b>	Text: Chapter 20 and 33 (974)
June 2	Food safety and food defense <b>Research Paper Proposal Due</b>	Text: Chapter 21 and 33 (972-973)
June 9	<b>Midterm Examination</b>	
June 16	Air resources and air pollution control	Text: Chapters 11, 14, 17, 22, 33 (961-971)
June 23	Water pollution and drinking water safety	Text: Chapter 18 and 33 (971-972)
June 30	Solid and hazardous waste management	Text: Chapter 19 and 33 (974-975)
July 7	Occupational health and safety, radiological health and noise pollution	Text: Chapters 4, 23, 24, 25
July 14	<b>Final Examination</b>	
July 28	<b>Research Presentation Sessions</b> <b>Research Papers Due</b>	
August 4	<b>Research Presentation Sessions</b>	