

INTRODUCTION TO ENVIRONMENTAL HEALTH FOR MAJORS

Fall 2009, Course: HEHS590
Tuesday and Thursday, 5:30 P.M. to 6:50 P.M.,
Tuesdays, East Campus, Classroom 3
Thursdays, East Campus, Classroom 2

Instructor: Michael S. Bloom, Ph.D., M.S. (518) 473-1821, SPH, Rm. 153 (Dept. of Epidemiology & Biostatistics) mbloom@albany.edu

Office Hrs: Monday 12:00-2:00 and by appointment.

Prerequisites: Major program of study in Department of Environmental Health Sciences or Department of Biomedical Sciences, or instructor permission.

Text Book:

Essentials of Environmental Health, Robert H. Friis, 2007, Jones and Bartlett Publishers.

- Available at the University at Albany Bookstore (located in the Student Center on the Uptown Campus), which will have a satellite store located in the Student Lounge of the East Campus during the first few days of the fall 2009 semester.
- Available at Mary Jane Books on 215 Western Ave. Albany, NY 12203-1273 (518) 465-2238.
- A single copy has been placed on restricted reserve at the Dewey Library on the Downtown campus.

Additional required readings will be distributed electronically via the ERES.

Course Description:

This course will employ a combination of team-based learning approaches, which have been demonstrated to effectively convey concepts and critical learning skills, as well as traditional didactic lectures. This course is designed to provide students with an introduction to and overview of the key areas of environmental health. Using the perspectives of the population and community, the course will cover factors associated with the development of environmental health problems. Students will gain an understanding of the interaction of individuals and communities with the environment, the potential impact on health of environmental agents, and specific applications of concepts of environmental health. The course will consist of a series of team-based learning exercises, lectures and an individual project and will cover principles derived from core environmental health disciplines.

Course Objectives:

Students who complete this course will be able to:

- (a) Discuss the history and definition of environmental health.
- (b) Discuss the association between population growth and dissemination of environmental pollutants.
- (c) Describe methods used in epidemiology and toxicology to assess environmental exposures and hazards.
- (d) Describe policies that have been developed to manage health risks associated with exposures to

environmental hazards.

- (e) Identify chemical, physical, and microbial agents that originate in the environment and can impact human health.
- (f) Describe specific applications of environmental health concepts to fields such as water quality control, food safety, and occupational health.

Grades:

- Class Participation: Given the nature of this course, class participation is a crucial component and will comprise 30% of the final course grade. A grade will be assigned for each student for each class session. Class session grades will be based on individual and/or team performance for readiness assessments and in-class projects assigned. Attendance is not required however non-participation or non-satisfactory completion of in-class assignments will result in a grade of zero. The three lowest class participation grades will be dropped from a student's record prior to assignment of the final class participation grade.
- Mid-term Exam: The mid-term exam will cover materials assigned in the readings (which may or may not be covered explicitly in lecture) and discussed in class. The mid-term exam will comprise 20% of the final grade.
- Class Project: Completion of the individual class project is required to pass this course. This project comprises submission of an abstract concerning an environmental exposure of the student's choice and a scientific presentation in class (these are described in detail below). Relevant due dates for the project are provided below. The class project will comprise 25% of the final course grade.
- Final Exam: The final exam will cover materials assigned in the readings and discussed in class; this will be comprehensive. A student must pass the final exam to pass this course. The final exam will comprise 25% of the final grade.
- Appeal process: Should a question or information source, for any assignment, present with substantial ambiguity a student or student-team is permitted to present a written appeal to the instructor in which the ambiguity is described and an evidence based rationale is provided for the incorrect response that had been provided. Appeals must be presented within by the following class session. Contingent on instructor approval a new grade may be assigned to the student or team submitting the written appeal.

The proposed course outline is subject to change which follows is subject to change. All required 'TBD' reading assignments will be provided in advance of topic date.

Date Topics

- 9/1 Course/Syllabus Overview. An Introduction to Team-Based Learning & Team Building
- 9/3 Introduction to Environmental Problems & Issues (**Chapter 1** in Friis; Pimentel et al. 2007)
- 9/8 Environmental Toxicology (**Chapter 3** in Friis; Calabrese & Baldwin, 2001)
- 9/10 Environmental Epidemiology (**Chapter 2** in Friis; Morgenstern & Thomas, 1993)
- 9/15 Environmental Policy & Regulation (**Chapter 4** in Friis; Birnbaum & Hubal, 2006)
- 9/17 Zoonotic & Vector-Borne Diseases (**Chapter 5** in Friis; TBD)
- 9/22 Toxic Metals & Elements (**Chapter 6** in Friis; TBD)
- 9/24 Toxic Metals & Elements, cont. (**Chapter 6** in Friis; TBD)
- 9/29 Pesticides & Other Organic Chemicals (**Chapter 7** in Friis; TBD)
- 10/1* Pesticides & Other Organic Chemicals, cont. (**Chapter 7** in Friis; TBD)
- 10/6 Ionizing Radiation (**Chapter 8** in Friis; TBD)
- 10/8 Non-ionizing Radiation (**Chapter 8** in Friis; TBD)

- 10/13 Nanotechnology (Hallock et al. 2009; Bystrzejewska-Piotrowska et al. 2009)
- 10/15 **Midterm Examination**
- 10/20 Water Quality (**Chapter 9** in Friis; TBD)
- 10/22 Water Quality, cont. (**Chapter 9** in Friis; TBD)
- 10/27 Air Quality (**Chapter 10** in Friis; TBD)
- 10/29 Air Quality, cont. (**Chapter 10** in Friis; TBD)
- 11/3 Food Safety (**Chapter 11** in Friis; TBD)
- 11/5 Solid Waste Management (**Chapter 12** in Friis; TBD)
- 11/10 Liquid Waste Management (**Chapter 12** in Friis; TBD)
- 11/12* Occupational Health (**Chapter 13** in Friis; Gochfeld, 2005)
- 11/17 **Student Presentations**
- 11/19 **Student Presentations**
- 11/24 **Student Presentations**
- 11/26 University at Albany closed in observance of the Thanksgiving Holiday
- 12/1 Review for Final Examination
- 12/3 **Final Examination**

*Other due dates of relevance: 10/2, *Class Presentation/abstract topic due* (please submit by email)
 11/15, *Written abstract due* (please submit by email).

Abstract and Presentation:

1. *Select an environmental exposure of interest*; this may be a metal, a chemical, a process or a natural phenomenon. Presentation/abstract topics will be approved on a first come first serve bases and no replication of topics will be permitted. Submit your topic of interest via email for approval by Friday October 2nd at the latest (you may submit earlier if you like). You will be assigned a presentation date following approval of your topic.

2. *Conduct a 'mini' literature review of your selected/approved topic.* Use the scientific literature to identify at least 10 pertinent original research publications (i.e., not review papers, websites, government documents, etc) describing studies which address your selected/approved topic. Focus on the human health issues related to the topic including sources of exposure, routes of exposure, human and/or animal/plant health effects, public policy implications etc.
 - a. Write an abstract describing your literature review. The abstract should be a single paragraph of not more than 250 words which clearly summarizes the findings of your paper. The following structured headings should be used to divide the text of abstracts: BACKGROUND, METHODS, RESULTS and CONCLUSIONS. All papers should clearly describe within the BACKGROUND section the background and objective of your paper. The METHODS section should state the search criteria employed to identify the literature reviewed and criteria for inclusion of studies in your review. You'll want to state the number of studies identified and selected for inclusion in your review. The RESULTS section should be a succinct synthesis of the information from the relevant studies you reviewed. The CONCLUSION section of the abstract should encapsulate your interpretation of the findings or provide a recommendation for public policy, prevention, treatment, hypotheses to be tested in future studies to fill critical data gaps. Citations should not appear in the abstract and submission via email is due on Friday November 15th at the latest. See attached form for an example or other examples may be found at <http://humupd.oxfordjournals.org/current.dtl>.
 - b. Design a scientific presentation describing your literature review. Include environmental health issues pertinent to your selected topic including sources of exposure, routes of

exposure, human health effects, animal/plant health effects, public policy implications etc. The duration of the presentation will be approximately 15-20 minutes, followed by a 5-10 question and answer session; however this will be contingent on the number of students registered for the course. You should plan on one title slide, content slides to be presented at the rate of approximately one slide per minute, and a slide describing your references at the end. Be sure to cite sources within the context of your presentation.

Assigned supplemental readings and lecture presentations (post lecture) will be posted on ERES:

- 1) Go to <http://albany.edu> site
- 2) Click on LIBRARIES
- 3) Click on Eres
- 4) Click on Electronic Reserves & Reserves Pages
- 5) Type HEHT590 and click on search
- 6) Choose INTRODUCTION TO ENVIRONMENTAL HEALTH FOR MAJORS
- 7) Type ENVIRONMENT (this is the password) and click on accept
- 8) Choose and click on necessary folder and then file
- 9) You can copy and print the chosen file for your convenience

Example abstract:

High Density Lipoprotein (HDL) Metabolism and the Human Embryo
Fujimoto, V.Y., Kane, J.P., Ishida, B.Y., Bloom, M.S., Browne, R.W.

BACKGROUND: High density lipoprotein (HDL) is the sole lipoprotein particle detected in human follicular fluid. The reported anti-atherogenic properties of HDL have been attributed in part to reverse cholesterol transport. The discoveries of the scavenger receptor class B type I (SR-BI) and the ATP-binding cassette A1 lipid (ABCA1) transporter have generated studies aimed at unraveling the pathways of HDL biogenesis, remodeling and catabolism. The production of SR-BI and ABCA1 knockout mice as well as other lipoprotein metabolism-associated mutants has resulted in reduced or absent fertility, leading us to postulate the existence of a human hepatic-ovarian HDL associated axis of fertility. Here, we review an evolving literature on the role of HDL metabolism on mammalian fertility and oocyte development.

METHODS: An extensive online search was conducted of published articles relevant to the section topics discussed. All relevant English language articles contained in PubMed/Medline, with no specific time frame for publication, were considered for this narrative review. Cardiovascular literature was highly cited due to the wealth of relevant knowledge on HDL metabolism, and the dearth thereof in the reproductive field.

RESULTS: Various vertebrate models demonstrate a role for HDL in embryo development and fertility. In our clinical studies, follicular fluid levels of HDL cholesterol and ApoAI levels were negatively associated with embryo fragmentation, but not embryo cell cleavage rate. However, the HDL component, PON1 arylesterase activity, was positively associated with embryo cell cleavage rate.

CONCLUSIONS: HDL contributes to intra-follicular cholesterol homeostasis which appears to be important for successful oocyte and embryo development.