

**Instructor:** Bill (William) Daniell, MD MPH      Office: Health Sciences, F-561E  
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Students are encouraged to visit my office with or without an appointment.

**Teaching Assistant:** Erin Stamper      Email: estamper@u.washington.edu  
MPH student; Environmental  
& Occupational Health Sciences

**Class sessions:** Wednesdays 10:30-12:20 (2 hours); Fridays 10:30-11:20 (1 hour); HSB T-739.  
Optional discussion sessions on Mondays at 10:30-11:50, upon request; HSB T-739.

**Web site:** <http://faculty.washington.edu/bdaniell/envh511/home.shtml>

**Course admin:** <http://moodle.washington.edu> [log in or create profile; choose EnvH 511; key = rutabaga ]

**E-reserves:** <https://eres.lib.washington.edu/eres/coursepage.aspx?cid=6838>

### **COURSE DESCRIPTION**

ENVH 511 (3 credits) provides a graduate level overview of the multidisciplinary field of environmental and occupational health. The course covers a broad spectrum of environmental hazards and influential factors, their interactions with human health and well-being, and their relevance to the effective assurance and promotion of public health. Workplace, community, home, regional and global problems are considered, with frequent use of case situations in the United States and developing countries. The course stresses examination of environmental health concerns in the context of social, economic, and other factors that mitigate the effects of environmental hazards or otherwise influence population health. The course should be useful for public health and health care professionals, environmental scientists and engineers, and public administrators.

**Pre-requisites:** None, although the course is restricted to graduate students.

### **COURSE LEARNING OBJECTIVES**

At the end of this course, the student should be able to:

1. Identify major types and sources of chemical, microbial, and physical contamination in water, air, soil, food, and waste materials.
2. Describe major pathways of human exposure to representative hazards in environmental and occupational settings.
3. Describe major effects of representative environmental and occupational hazards on human health.
4. Describe genetic, physiologic, and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.
5. Describe the potential influence of behavioral, social, economic, and political factors on relationships between environmental hazards and human health.
6. Describe basic strategies for assessing, preventing, and controlling or managing health and safety hazards in environmental and occupational settings.
7. Identify major regulations, agencies, programs, and stakeholders related to environmental and occupational health hazards.
8. Locate, organize and present information about environmental hazards and other health determinants, related to a specific complex situation; and formulate strategies for preventing, controlling, or managing those hazards.
9. Communicate information about environmental health risks and response strategies to an audience with limited knowledge of the subject.

COURSE SCHEDULE

Week	Date (Mon)	Wednesday	Friday	Deadlines
1	5-Jan	Introduction Big picture	Case: South Seattle ( ENVH 590 ) *	
2	12-Jan	Exposure	Built environment	
3	19-Jan	Waste	Waste	Homework #1
4	26-Jan	Exposure-response	Wastewater	Case: Scope Case: Evaluation #1
5	2-Feb	Outdoor air	Outdoor air	Homework #2
6	9-Feb	Assessment	Indoor environment	Case: Outline
7	16-Feb	Water	Water	Homework #3
8	23-Feb	Work	Work	Case: Tech Report Case: Exec Summary Case: Evaluation #2
9	2-Mar	Global scale pollution	Vector/Zoonotic disease	Case: Peer reviews
10	9-Mar	Food	Conclusion	Case: Revised Exec Summary (optional)
Finals	16-Mar	FINAL EXAM Monday 8:30-10:20		

\* Dash-outline boxes indicate ENVH 590 sessions (Fridays 11:30-12:20)

EnvH 590 is a separate 1-credit course ("Environmental & Occupational Health in Developing Countries") providing additional coverage of topics covered in ENVH 511, focused on situations in developing countries. Enrollment in EnvH 590 requires concurrent enrollment in EnvH 511.

Students who are enrolled in EnvH 511—but not enrolled in EnvH 590—are not required to attend the Friday sessions at 11:30-12:20.

There are no scheduled sessions on Mondays. However, if there is interest, *optional* sessions can be arranged on Mondays to discuss the case study, homework assignments, or final exam.

## COURSE REQUIREMENTS

The **due time** for assignments is usually *about* 5 pm, on the specified date. Any due date or time is flexible, with advance agreement from the instructor or TA. All assignments except in-class tasks must be turned in electronically, using the specified Catalyst site. The **file name** for electronically submitted files must include the student's last name (or group name) and the assignment name.

### **1. Community environmental health case study**

Each student will work in a group of 3 or 4 students, to investigate environmental health hazards in communities located in and near the Duwamish River and industrial area in South Seattle. A hypothetical case scenario provides "real world" instructions for the assignment.

Each group will provide two intermediate status reports during their investigation, and write a technical report. Each student will write a "plain language" executive summary.

The technical report and executive summary should use double spacing, 12-point font, and 1-inch or larger margins. Alternative formats can be acceptable, with advance approval from the instructor or TA.

#### *Group tasks*

**Technical report:** Each group will write a technical report (about 10-12 pages; maximum 3,000 words) describing available information about: important environmental health hazards in the community; socioeconomic or political factors that might mitigate the influence of environmental hazards; and other relevant determinants of health.

**Status reports:** Each group will produce two intermediate status reports. The "scope of problems" report is a list and brief description of topics or problems under investigation, sorted into categories of relative importance (as determined by the group at that point in time). The second report is an annotated outline.

#### *Individual tasks*

**Executive summary:** Each student will write a 1-2 page "plain language" executive summary (max. 500 words), based on their group's technical report, but reflecting the individual student's conclusions or opinions. The summary should: briefly describe environmental health problems that the student judged to be most important or unexpectedly lower importance; identify any non-environmental influences considered relevant; explain overall conclusions (e.g., why certain hazards or influences are or are not most important); and offer recommendations for the case-study organization or community.

Students will have an opportunity to revise their executive summary after receiving "peer review" comments by class members. Revision is optional.

**Peer performance evaluation:** Each student will complete two brief online surveys evaluating the relative performance of students in their group.

Due dates for intermediate and final tasks are:

- Jan 28 Wed Scope of problems
- Feb 11 Wed Annotated outline
- Feb 25 Wed Technical report
  
- Feb 27 Fri Executive summary
- Mar 13 Fri Executive summary revision—optional
  
- Jan 30 Fri Peer performance evaluation #1
- Feb 27 Fri Peer performance evaluation #2

2. **Peer review:** Each student will complete a peer review for two other students' case-study executive summaries, using the same evaluation rubric that the instructor and TA will use. The due date is Friday, March 6.

### 3. **Homework**

There are three homework assignments with short-answer or fixed-option questions addressing basic, cross-cutting "principles" of environmental health. The assignments will be handed out 1-2 weeks before the due date. Students are encouraged to discuss the questions and possible answers together; however, each student must submit an individual response, in their own words. Due dates are:

- Jan 23 Fri Homework #1: exposure characterization and control
- Feb 6 Fri Homework #2: dose-response relationships; descriptive toxicology
- Feb 20 Fri Homework #3: risk assessment

4. **Final Examination:** There will be a final exam, during Finals week. There is no mid-term exam.

### 5. **Class participation and professionalism**

**Participation:** The ultimate goal of this course is for students to become capable of applying material they learn during this class, and not just be exposed to or memorize a collection of facts and principles. Class sessions will include a mix of lectures and class participation, including short verbal or written exercises completed as individuals or in small *ad hoc* groups during class, or completed as individuals online after class; for example, polls, responses to a question(s) or prompt, question formulation.

**Professionalism:** Students are expected to display courtesy and respect for classmates—during class and in electronic comments or peer reviews—and for the instructor and TA.

Students are also expected to maintain high standards of **academic conduct**. In particular, in written materials, students must acknowledge the source of information or concepts that do not originate entirely from the student's own work or thoughts. The instructor will assume that graduate students enrolled in this class are already familiar with proper use of citations and the definition of plagiarism. Information about UW and School policies, plus links to useful resources are available at:

- UW—Academic Honesty: cheating and plagiarism: <http://depts.washington.edu/grading/issue1/honesty.htm>
- SPHCM—Plagiarism; proper use of citations: <http://sphcm.washington.edu/gateway/plagiarism.asp>

## **STUDENT EVALUATION**

Course grades are determined on the basis of:

- 40% Community environmental health case study
  - ( 5%) Intermediate status reports: scope of problems; outline
  - 25% Technical report (grade is based on final report, if intermediate reports are adequate)
  - 15% Executive summary
  - Peer performance evaluation (included in Participation and Professionalism, for grading)
- 5% Peer review
- 15% Homework
- 20% Final examination
- 20% Participation and professionalism

Each student's grade for the case-study technical report is determined by the "group" grade assigned for that report, with possible adjustment up or down based on peer performance evaluations and observations by the instructor or TA.

Grading of the case-study technical report and executive summary will use evaluation rubrics, provided at the start of the assignment. Students will have opportunities to suggest revisions to rubrics, before use.

Assignment of numeric grades uses guidelines adapted from the Department of Health Services grading guidelines for graduate students ( <http://depts.washington.edu/hserv/policy/grading.shtml> )

3.9-4.0	Excellent and exceptional work...for a graduate student
3.7-3.8	Strong work...
3.4-3.6	Competent and sound work...
3.2-3.3	Adequate work..., although some weaknesses are evident
2.9-3.1	Borderline work...
2.7-2.8	Deficient but acceptable work...
<2.7	Unacceptable work...

Many of the participation assignments (e.g., in-class survey) are relatively straightforward and generally will be graded only as complete ("check") or not. Excellent or deficient effort can be recognized with a check "plus" or "minus."

### CLASSROOM POLICY

Use of **laptops** is not allowed during class sessions, other than in limited circumstances where internet access might enhance a class exercise. **Cell phones** should be silenced. Students should exit the classroom if they want to listen to a voice message or answer a call or text message.

### ACCOMMODATIONS

Students with disabilities are welcome to request academic accommodations. To request academic accommodations due to a disability, please contact Disability Resources for Students, 448 Schmitz Hall, 206-543-8924 (V/TTY). If you have a letter from Disability Resources for Students indicating that you have a disability which requires academic accommodations, please present the letter to the instructor (Bill Daniell) so we can discuss the accommodations you might need in this class.

### READING ASSIGNMENTS

Course textbook: **Friis** RH. *Essentials of Environmental Health*. Boston: Jones & Bartlett, 2007. [Hard copy on reserve in Health Sciences Library].

All other assigned readings will be downloadable (or URL is provided) at the course E-Reserves site.

<b>Week</b>	<b>Topic</b>	<b>Reading</b>
<b>1</b>	Big Picture South Seattle	Friis Ch. 1 Assignment: Community Environmental Health Case Study McClure R and McDonald C (Brown PJ, photography). A River Lost: Decision time on the Duwamish. <i>Seattle Post-Intelligencer</i> . Nov, 2007. <a href="http://seattlepi.nwsource.com/specials/duwamish/">http://seattlepi.nwsource.com/specials/duwamish/</a> Slodysko C. Burning Rubber: Toxic Emissions Roll Over South Seattle. <i>the Stranger</i> January 2, 2008. <a href="http://www.thestranger.com/seattle/Content?oid=474273">http://www.thestranger.com/seattle/Content?oid=474273</a>
[Week 1 continues on next page]		

Week	Topic	Reading
1	Plain Language	Larson G. <i>King County Plain Language Writing Guide</i> . <a href="http://www.metrokc.gov/exec/styleguide/plain/">http://www.metrokc.gov/exec/styleguide/plain/</a>  * (Recommended) NIH. PlainLanguage.gov: Improving Communication from the Federal Government to the Public. <a href="http://www.plainlanguage.gov/index.cfm">http://www.plainlanguage.gov/index.cfm</a>  * (Recommended) NIH. Plain Language Online Training. <a href="http://plainlanguage.nih.gov/CBTs/PlainLanguage/login.asp">http://plainlanguage.nih.gov/CBTs/PlainLanguage/login.asp</a>
	Environmental Justice	Brulle RJ, Pellow DN. Environmental justice: human health and environmental inequalities. <i>Annu Rev Public Health</i> . 2006;27:103-24.
2	Exposure and Control	Ryan PB. Exposure assessment, industrial hygiene, and environmental management. Ch 4 in Frumkin; pp. 72-95. [Notes: full "Frumkin" citation, below; PDF can be viewed but not printed]
	Regulation	Friis Ch 4 (pp 71-81).
	Built Environment	Shaw M. Housing and public health. <i>Annu Rev Public Health</i> . 2004;25:397-418.  Frumkin H. Urban sprawl and public health. <i>Public Health Rep</i> . 2002;117:201-17.
3	Waste	Friis Ch 12 Friis Ch 6, Ch 7 (pp 141-44, 155-64).
4	Exposure-Response	Friis Ch 2 (pp 36-41), Ch 3.  * (Recommended) Richardson JR, Miller GW. Toxicology. Ch 2 in Frumkin, pp. 24-45. [Notes: citation, below; PDF cannot be printed]
	Wastewater	Friis Ch 12 (pp 314-21).
5	Outdoor Air	Friis Ch 10.  <i>GEO-4</i> Ch 2 (pp 52-59). [Note: full "GEO-4" citation, below]
6	Assessment	Friis Ch 4.  Cole BL, Fielding JE. Health impact assessment: a tool to help policy makers understand health beyond health care. <i>Annu Rev Public Health</i> . 2007;28:393-412.  Goldstein BD. Advances in risk assessment and communication. <i>Annu Rev Public Health</i> . 2005;26:141-63.
	Indoor Environment	Friis Ch 10 (249-53), Ch 8 (pp 165-72).
7	Water	Friis Ch 9.  <i>GEO-4</i> [see below] Ch 4 (pp 129-35).
8	Work	Friis Ch 13.
9	Global Scale Pollution	Friis Ch 10 (pp 253-60), Ch 8 (pp179-88).  <i>GEO-4</i> [see below] Ch 2 (pp 59-77).
	Vector/Zoonotic Dz	Friis Ch 5.

Week	Topic	Reading
10	Food	Friis Ch 11, Ch 7 (145-54). Story M, et al. Creating healthy food and eating environments: policy and environmental approaches. <i>Annu Rev Public Health</i> . 2008; 29:253-72

A limited number of web based materials may be assigned for individual lectures, during the course.

**Recommended resources** (not required)

A variety of resource materials for specific subject areas will be suggested or referenced during individual class sessions. The following resource materials can be useful throughout the class.

General environmental and occupational health textbooks [Hard copy on reserve in Health Sciences Library]

**"Frumkin"**

Frumkin H (ed). *Environmental Health: From Global to Local*. San Francisco: Jossey-Bass (John Wiley & Sons), 2005.

Moore GS. *Living with the Earth: Concepts in Environmental Health Science*. 3<sup>rd</sup> ed. Boca Raton: CRC Press, 2007.

Rosenstock L, et al (eds). *Textbook of Clinical Occupational and Environmental Medicine*. 2<sup>nd</sup> ed. Philadelphia: Elsevier-Saunders, 2005.

Global environmental health

**"GEO-4"**

UNEP (United Nations Environment Programme). *Global Environmental Outlook, GEO-4: Environment for Development*. UNEP: 2007. <http://www.unep.org/geo/geo4/media/>

Toxicology and risk assessment

Gilbert SG. *A Small Dose of Toxicology: The Health Effects of Common Chemicals*. NY: CRC, 2004.

- Explore the book: <http://www.asmalldoseof.org/SmDs.poster.03.28.06.pdf>
- History of Toxicology; Milestones & Discoveries: <http://www.asmalldoseof.org/historyoftox/index.php>
- Interactive materials at author's web site: <http://www.asmalldoseof.org/>

Rodricks JV. *Calculated Risks: The Toxicity and Human Health Risks of Chemicals in our Environment*. Second Edition. NY: Cambridge Univ Press, 2007. [Bill Daniell has old version].

Klaasen CD and Watkins JB. *Casarett and Doull's Essentials of Toxicology*. NY: McGraw-Hill, 2007. Electronic resource accessible via UW at: <http://www.accesspharmacy.com/resourceToc.aspx?resourceID=400>

Klaasen CD (ed). *Casarett and Doull's Toxicology: Basic Science of Poisons*. NY: McGraw-Hill, 2008. [on reserve in Health Sciences Library]