Course Syllabus

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ENVH 501 Foundations of Environmental Health
Winter Quarter 2018

Instructor:
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Course Assistant:
Mary Saucier (saucier@uw.edu)

Class sessions and location:

T 8:30-10:20 AM HSB T478

Th 8:30-10:20 AM HSB T478

Course description

This course provides an overview of environmental and occupational health, stressing a systems approach to complex problems. The course examines a representative sample of environmental hazards and major environmental media, with comparative local and global case problem solving. The course also emphasizes a “One Health” approach to environmental and occupational health issues that considers the ecological relationships between human, animal, and environmental health. Course assignments stress developing basic literacy in environmental and occupational concepts and applying this knowledge to problem solving.

Pre--requisites: Graduate students majoring in Environmental and Occupational Health Sciences; or other graduate students with permission of the instructor plus previous college-level courses in chemistry and biology.

Learning objectives

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

1. ***Foundations:*** *Describe and discuss foundational concepts and strategies of environmental and occupational health sciences; their relationship to public health practice, and draw generalizable conclusions about how they apply in different situations*.
    - ***Hazards:*** Describe major chemical, microbial, and physical health hazards found in air, water, food, soil, and wastes, and describe their principal effects on health.
    - ***Exposure:*** Describe basic strategies for identifying, evaluating, preventing, and controlling exposures to health and safety hazards in environmental and occupational settings.
    - ***Health risk:*** Describe basic strategies for assessing health risk and identifying acceptable levels of risk associated with environmental and occupational hazards.
    - ***Health impacts:*** Describe major environmental and occupational health problems associated with morbidity and mortality, in industrialized countries and in developing countries.
    - ***Environmental controls:*** Describe basic strategies for preventing and controlling exposures to health and safety hazards in environmental and occupational settings, including the 10 essential services of Public Health and the concepts of primary, secondary, and tertiary prevention.
    - ***Policies:*** Describe major policies, regulations, and institutions involved in controlling or mitigating environmental and occupational health risks, and the history and philosophy of public health related to environmental health policy.
    - ***Vulnerability:*** Discuss the importance of factors that contribute to individual and population vulnerability, such as biological susceptibility, social, political and economic determinants of health and how they contribute to health and health inequities as well as the cumulative burden of environmental health impacts.
    - ***Values:*** Discuss the importance of equity, justice and sustainability in addressing problems related to the environment and health.
    - ***Evolutionary change:*** Describe and discuss potential impacts of demographic change, economic development, energy demand, human--modified environments, pollution, and climate and ecosystem change on human health, food security and water security.

2. ***Systems:*** *Apply foundational concepts and strategies to environmental and occupational health problems; characterize broader environmental and social contexts; and assess relationships that cumulatively influence health, well--being and equity*.
    - ***Environmental context:*** Identify and characterize natural ecosystems and human--altered environments that might influence distribution, human exposure, health risk or vulnerability associated with an environmental hazard.
    - ***Social context:*** Identify and characterize the socioeconomic, political, cultural, behavioral and perceptual factors that might influence or interact with environmental hazards or health risks.
    - ***Stakeholders:*** Identify and describe stakeholders, and characterize stakeholder relationships and power dynamics.

- ***Systems thinking:*** Analyze relationships between and cumulative influences of environmental hazards, environmental and social contexts, and vulnerability on health, well-being and equity.
- ***One Health approach to health systems:*** Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health). Be able to diagram the relationships between human, animal, and environmental systems, ranging from the planetary to the molecular scale.
- ***Opportunities:*** Identify opportunities for and barriers to sustainable changes that could promote health, well-being and equity.

3. ***Investigative skills:*** *Apply foundational concepts and strategies, contextual analysis, and systems thinking in comprehensive investigations of environmental and occupational health*
   - ***Evidence base:*** Locate, organize and analyze information about the problem and context.
   - ***Critical thinking:*** Apply evidence-based decision making and critical thinking in the investigation.
   - ***Scholarship:*** Demonstrate creativity, inquisitiveness, passion, and rigor in the application of public health problem-solving skills.
   - ***Alternatives:*** Formulate evidence--based, context-appropriate and sustainable alternatives to address the problem and promote health, well-being and equity.

4. ***Communication skills:*** *Communicate information in plain language (orally and in writing) to a target audience about environmental health risks, influential factors, and prevention strategies; and anticipate or identify risk perceptions and relevant concerns in the target audience*.

5. ***Professional skills:*** *Perform effectively on teams and in different team roles; promote collegiality, inclusion and trust; and apply ethical principles to the learning experience*.

Classroom Climate

Diverse backgrounds, embodiments, and experiences are essential to the critical thinking endeavor at the heart of university education. Therefore, I expect you to follow the UW Student Conduct Code in your interactions with your colleagues and me in this course by respecting the many social and cultural differences among us, which may include, but are not limited to: age, cultural background, disability, ethnicity, family status, gender identity and presentation, citizenship and immigration status, national origin, race, religious and political beliefs, sex, sexual orientation, socioeconomic status, and veteran status. I will acknowledge from the beginning that all of us, including your instructor, have a lot to learn about combatting racism, sexism, classism, and other forms of discrimination and bias, and that this learning process will continue throughout our careers. Please talk with me right away if you experience disrespect in this class, and I will work to address it in an educational manner. UW students can also report incidents of bias or violations of UW policies for non-discrimination using the Bias Reporting Tool available at: **http://www.washington.edu/bias/** **(http://www.washington.edu/bias/)** .

Course Schedule

Week #	Module	Tues date	Tuesday topic	Thurs date	Thursday Topic
1	Introduction to course and cross-cutting themes			1/4	Air, water, soil as media, nutrient cycles, One Health, occupational health, Planetary health, Social and economic determinants of health, history of public health, core functions of public health, primary, secondary, tertiary prevention
2	Ecosystems	1/9	Ecosystems concepts, biodiversity, biomagnification, climate change, disease emergence, niches	1/11	Introduction to Concept mapping workshop
3	Demographics	1/16	Population increase and migration-humans and animals, globalization, global burden of disease, major trends in mortality and morbidity	1/18	• Case Discussion • Due: Draft Concept maps #1
4	Emerging infectious disease	1/23	Zoonoses, human-animal conflicts, vectors, Antimicrobial resistance, disease surveillance	1/25	• Case Discussion • Due: Final Concept map #1
					• Case Discussion

5	Food systems: animal	1/30	Animal agriculture, aquaculture, fisheries-production and distribution chain, role of animal sourced foods on nutrition	2/1	• Due: Draft Concept maps #2
6	Food systems: plant	2/6	Plant agriculture-production and distribution chain.	2/8	• **Midterm Exam** • Due: Final Concept map #2
7	Energy systems	2/13	Energy systems and extractive industries and waste	2/15	• Case Discussion • Due: Group project Causal Loop Diagrams draft and Policy Brief draft.
8	Manufacturing systems	2/20	Industrial ecology, occupational vs. environmental risks	2/22	• Case Discussion • Due: Draft Concept maps #3
9	Built Environment	2/27	Urbanization and urban systems, land use, transportation	3/1	• Case Discussion • Due: Final Concept map #3
10	Student presentations	3/6	**Student project presentations**	3/8	**Student project presentations**
11	Final Exam			FRIDAY 3/16	• **Final Exam** • **Group Project Write-Ups Due**

Course Organization

The course is organized in weekly modules. Each module examines one major environmental "system". For each system, we will examine representative biological, physical, chemical, and social hazards and human health effects (as well as effects on the health of animal populations and the ecosystem). We will also discuss common mechanisms of exposure, risk and health impact; population vulnerability, including

occupational exposures and occupational health vs. community exposures, social determinants of health, inequity; and strategies to control exposure and promote health--favorable change.

Students need to complete assigned preparatory reading, viewing and short tasks *before* each class session.

Module day 1 (Tuesday) sessions will be a combination of instructor-led, active lecture format to reinforce the preparatory material and "flipped classroom" approaches requiring students to have already reviewed an online lecture (using Panopto) and accompanying materials. During these sessions, use of computers, smart phones etc. will not be allowed. Students must come to class on Tuesday prepared to answer any of the questions and define any of the terms on the weekly question and definition list. At the end of the Tuesday session, there will a short discussion about the weekly case work, in preparation for the Thursday session.

Module day 2 (Thursday) sessions will be case-based problem solving sessions that emphasize systems approaches. In general, two cases will be discussed, and the class will have been divided up on Tuesday or before to work on one of these two cases. We will use the Lucid software program which is available for free as an online version. To get the program, sign up using your .edu address at:

https://www.lucidchart.com/pages/usecase/education
(https://www.lucidchart.com/pages/usecase/education)

click on "free account" to get started.

Using this program will allow you to create rich pictures (also known as 'mind maps' or 'concept maps' -we'll talk about what this is!) about particular concepts, and (for group project) progress to interrelationship digraphs and causal loop diagrams. Each student will be expected to come to class on Thursday having uploaded to the Canvas site a copy of their concept map/ rich picture for the case problem they have been assigned. They will be expected to have worked on this independently. During the class discussion, we will review these rich pictures and further our understanding both of the system being discussed as well as the systems thinking approaches that are appropriate. There will be three separate individual concept map assignments.

Required Reading and Viewing

Students are required to complete preparatory reading and viewing assignments *before* each class session. In general, preparatory reading and review of the mini-lecture will be required to be completed before the Tuesday session. Students need to come to class on Tuesday prepared to discuss in depth the questions on the weekly question list, and be able to define the terms listed on that list.

Concept maps (Rich pictures) for the assigned cases of the week will be due at that Thursday session.

A detailed list of assigned reading and viewing materials will be placed and maintained on the Canvas website.

Typical assigned materials for the Tuesday sessions include:

- Short video lectures by the instructor or other faculty speakers (approximately 20 minutes) covering learning objectives, key concepts and definitions for the weekly module.
- Background reading that may include textbook chapters, journal articles, and policy documents.
- List of questions and definitions (based on the background reading) for discussion in the Tuesday session.

Textbook: There is no required textbook

Lucid Software: Highly recommended for the concept mapping/rich picture/causal loop work. Available for free at **https://www.lucidchart.com/pages/usecase/education (https://www.lucidchart.com/pages/usecase/education)** use your edu address click on "free account" to get started.

Manual about Causal Loop Diagrams ("CLD Course Participant Manual"): available on the Canvas Site. It mentions another software program but you will be able to easily adapt to Lucid.

Assignments

Weekly assignments

- **Reading or viewing background materials and lectures, and list of weekly questions and definitions.**
  To be completed before the Tuesday class session, as described above. This preparation is essential for success in the course.
- **Concept maps ("Rich Pictures") (3)**
  Each student will produce one concept map ("Rich picture") before each of seven case-problem sessions. Students will post a scanned or electronic copy on Canvas before class, and if possible bring a paper copy to class.

  Concept mapping is a "systems thinking" exercise to portray ideas about connections between environmental and social causative factors, other influential factors or stakeholder--agents, and impacts on health and well-being. The instructor will provide guidance on concept mapping, including an in class demonstration about how to create a "rich picture" on the second day of class. Students are encouraged to use the free Lucid software to create their maps, although with permission of the instructor they may use other methods.

  For each concept map assignment, I will provide comments through the Canvas site, and expect that you will revise based on the class discussion, my comments, and any other additional input you have. The grade for the concept map will be based on the final draft (due the second session for each map). Each concept map will be worth 10% of your overall grade.

Exams:

There will be an in class midterm and final exam. These will be based heavily on the learning objectives

outlined in each lecture as well as the terms and definitions presented each week in the recorded lecture.

Group-project: Policy Brief supported by a compelling causal loop diagram (1)

Each student will collaborate **once** with a group of approximately 3 students over the course of the term to prepare an in-depth systems analysis of an environmental health problem. This project will include completing a rich picture, inter-relationship digraph, and causal loop diagram for the case problem. Based on this causal loop diagram, the group will collaborate to produce a 2-3-page executive summary level policy brief document, outlining the problem being addressed and presenting some policy priorities for addressing the problem.

What is a policy brief?

> "A policy brief is a concise summary of a particular issue, the policy options to deal with it, and some recommendations on the best option. It is aimed at government policymakers and others who are interested in formulating or influencing policy. Policy briefs can take different formats. A typical format…contain[s] perhaps 700 words. It has an attractive design, and may have one or more photograph[s]" [source: **FAO Food Security Communications Toolkit (http://www.fao.org/docrep/014/i2195e/i2195e00.htm)**]

The policy brief for this assignment should be <1000 words, not counting references. Since this is an academic exercise, the policy brief should include line-item reference notations linked to a separate reference list.

Each group will present an oral presentation about the problem, the causal loop diagram they have created, and the policy brief during the last week of the class. A written version of the policy brief document as well as the causal loop diagram will be due on the final day of class (same day as the final exam). This write-up must include a description of the roles of each of the group members in creating the document. The write-up should conform to principles of "plain language" as outlined by NIH (see **https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language (https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language)**). A draft of the causal loop diagram is due in Week **7**. The plan is to have the drafts reviewed by the DEOHS technical writing consultant, with feedback to the groups for final revision. The final version and the write-up is due in **Week 11**.

Field experience (optional extra credit):

Students are encouraged - but not required - to complete a field experience.

Additional details will be provided during class, including possible examples. The experience can be connected to the student's policy brief or completely separate. Each student will write a reflective statement about the experience, to be shared with the class on an electronic discussion board. The experience and reflection will count as extra credit in the overall course grade.

Participation

Preparation before class, participation in class discussion, and group collaboration in the group project are essential for successful instruction and learning in this course. While you will not be explicitly graded on attendance, participation in class discussions is an important part of your learning, therefore 15% of your grade will be based on your participations in class discussions and case problem solving sessions.

Communication

One goal of this course is to provide experience with a variety of communication formats, and to cultivate skills in "plain language" communication. See NIH guide to plain language **https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language/training (http://%20https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language/training)**

(http://%20https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language/training) ## Computers or other electronic devices in class:

In general, **students are expected not to use electronic devices and computers during the Tuesday classes**, unless the instructor specifically requests that a student use an electronic device for a particular task (such as to display a rich picture), or to accommodate an individual student's disability needs. The rationale for this is to encourage adequate pre-class preparation and in-class interactive discussion. Copies of any slides will be posted on the Canvas site.

During the Thursday case sessions, computers will be used at the request of the instructor for specific activities such as displaying work on a rich picture or working on an interrelationship digraph.

Grading:

Course grades are determined on the basis of the following weighting:

Preparation and class participation	15%
Weekly concept maps/rich pictures (3X10% each)	30%
Exams	35%
Midterm = 15% Final = 20%	
Group causal loop diagram and Policy brief	20%
TOTAL	**100%**
OPTIONAL: Field experience Additive (5%)	

I will provide evaluation-grading rubrics (based on the course learning objectives) in advance for all major assignments.

3.9-4.0 Excellent and exceptional work…for a graduate student

Work at this level is unusually thorough, well--reasoned, sophisticated, and well--written. Work shows an incisive understanding of issues, and demonstrates clear recognition of appropriate approaches to address problems and questions.

3.7-3.8 Strong work…

Work at this level is thorough and well--reasoned, indicates strong understanding of appropriate approaches to address problems and questions, and demonstrates clear recognition and good understanding of salient issues and problems.

3.4--3.6 Competent and sound work…

Work at this level is thorough and well--reasoned, and shows sound understanding of appropriate approaches to address problems and questions. Shows adequate understanding of issues and problems. Minor misunderstandings or errors may (or may not) be present.

3.2--3.3 Adequate work…, although some weaknesses are evident

Work at this level is moderately thorough and well--reasoned, but understanding of the important issues is less than complete. Approaches to address problems and questions are generally adequate. However, the work has one or more weaknesses or limitations.

2.9--3.1 Borderline work…

Work at this level meets minimal expectations. Understanding of salient issues is incomplete. Approaches to address problems and questions are minimally adequate. The work has substantial weaknesses or limitations.

2.7--2.8 Deficient but acceptable work…

Work at this level does not meet minimal expectations. Work is inadequately developed or flawed by numerous errors and misunderstanding of important issues. Approaches to address problems and questions are weak and fail to demonstrate the expected knowledge or competence.

<2.7 Unacceptable work…

Work below this level is graded relative to performance expected for an undergraduate student. See these two UW web pages for information (student guide; faculty resource).

Academic Integrity

Students at the University of Washington are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed

to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the SPH Academic Integrity Policy. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.

Access and accommodations

The student experience in this class is important to me (Peter Rabinowitz, instructor). If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations, you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. Qualifying conditions include but are not limited to mental health, attention-related, learning, vision, hearing, physical or health impacts. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor and DRS. It is policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

(https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language/training)

Course Summary:

Date	Details	
Thu Jan 4, 2018	**Reading & Viewing for Week 1** (https://canvas.uw.edu/courses/1129352/assignments/3998960)	due by 8:30am
Tue Jan 9, 2018	**Reading & Preparation for Week 2** (https://canvas.uw.edu/courses/1129352/assignments/3998957)	due by 8:30am
Thu Jan 11, 2018	**Introduction to Concept Mapping workshop, Week 2** (https://canvas.uw.edu/courses/1129352/assignments/3998939)	due by 8:30am
Tue Jan 16, 2018	**Reading & Preparation for Week 3** (https://canvas.uw.edu/courses/1129352/assignments/3998958)	due by 8:30am
Thu Jan 18, 2018	**Draft Concept Map #1 Assignment, Week 3** (https://canvas.uw.edu/courses/1129352/assignments/3998940)	due by 8:30am

Tue Jan 23, 2018	Reading & Preparation for Week 4 (https://canvas.uw.edu/courses/1129352/assignments/3998959)	due by 8:30am
Thu Jan 25, 2018	Final Concept Map #1 Assignment , Week 4 (https://canvas.uw.edu/courses/1129352/assignments/3998941)	due by 8:30am
Tue Jan 30, 2018	Reading and Preparation for Week 5: (https://canvas.uw.edu/courses/1129352/assignments/3998952)	due by 8:30am
Thu Feb 1, 2018	Draft Concept Map #2 Assignment & Begin Group Concept Maps, Week 5 (https://canvas.uw.edu/courses/1129352/assignments/3998942)	due by 8:30am
Tue Feb 6, 2018	Reading and Preparation for Week 6 (https://canvas.uw.edu/courses/1129352/assignments/3998953)	due by 8:30am
Thu Feb 8, 2018	Final Concept Map #2 Assignment, Week 6 (https://canvas.uw.edu/courses/1129352/assignments/4032598)	due by 8:30am
	MIDTERM, Week 6 (https://canvas.uw.edu/courses/1129352/assignments/3999425)	due by 8:30am
Tue Feb 13, 2018	Reading and Preparation Week 7 (https://canvas.uw.edu/courses/1129352/assignments/3998956)	due by 8:30am
Thu Feb 15, 2018	Drafts Due: Group Causal Diagram and Policy Brief (https://canvas.uw.edu/courses/1129352/assignments/3998948)	due by 8:30am
	Group Project: Draft Causal Loop Diagrams & Draft Policy Brief, Week 7 (https://canvas.uw.edu/courses/1129352/assignments/3998943)	due by 8:30am
Tue Feb 20, 2018	Reading and Preparation for Week 8 (https://canvas.uw.edu/courses/1129352/assignments/3998954)	due by 11:59pm
Thu Feb 22, 2018	Draft Concept Map #3 Assignment , Week 8 (https://canvas.uw.edu/courses/1129352/assignments/3998944)	due by 8:30am
Tue Feb 27, 2018	Reading and Preparation for Week 9 (https://canvas.uw.edu/courses/1129352/assignments/3998955)	due by 8:30am
Thu Mar 1, 2018	Final Concept Map #3 Assignment, Week 9 (https://canvas.uw.edu/courses/1129352/assignments/3998945)	due by 8:30am
Tue Mar 6, 2018	Group Presentation #1 (https://canvas.uw.edu/courses/1129352/assignments/3998950)	due by 8:30am

Thu Mar 8, 2018	**Group Presentation #2** (https://canvas.uw.edu/courses/1129352/assignments/3999426)	due by 8:30am
Tue Mar 13, 2018	**Group Project: Final Causal Loop Diagrams & Policy Brief** (https://canvas.uw.edu/courses/1129352/assignments/3998949)	due by 8:30am
	Final Exam (https://canvas.uw.edu/courses/1129352/assignments/3998947)	due by 11:59pm
	Midterm Review Week 6 (https://canvas.uw.edu/courses/1129352/assignments/3998951)	