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Office hours Monday 1-2 PM by appointment: (contact Vickie Ramirez ramirezv@uw.edu to schedule appointments)

Class sessions and location T 8:30--10:20 AM HST T 739
Th 8:30--10:20 AM SOCC 308

Web site UW Canvas: <https://canvas.uw.edu/courses/1099255>

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)
 - **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 problems.*
- **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.

Course Schedule:

Week	Module	Tues date	Tuesday topic	Thurs date	Thursday Topic
1	Introduction to course and cross-cutting themes	1/3	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	1/5	Concept mapping, case examples
2	Ecosystems	1/10	Ecosystems concepts, biodiversity, biomagnification, climate change, disease emergence, niches	1/12	Cases: (concept maps due)
3	Demographics:	1/17	population increase and migration- humans and animals, globalization, global burden of disease, major trends in mortality and morbidity,	1/19	Cases: (Concept maps due)
4	Emerging infectious disease	1/24	Zoonoses, human-animal conflicts, vectors, Antimicrobial resistance, disease surveillance	1/26	Cases: (concept maps due)
5	Food systems: animal	1/31	animal agriculture, aquaculture, fisheries- production and distribution chain, role of animal sourced foods on nutrition	2/2	Cases: (concept maps due)
6	Food systems: plant	2/7	plant agriculture- production and distribution chain:	2/9	Midterm
7	Energy systems	2/14	Energy systems and extractive industries and waste	2/16	Cases: (concept maps due) Group project causal loop diagrams due

ENV H 501 Foundations of Environmental Health**Winter 2017**

8	Manufacturing systems	2/21	Industrial ecology, occupational vs. environmental risks	2/23	Cases: (concept maps due)
9	Built Environment	2/28	Urbanization and urban systems, land use, transportation	3/2	Cases: (concept maps due)
10	Student presentations	3/7	Student project presentations	3/9	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 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 and accompanying materials. 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 cases, 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 VenSim software program (<http://vensim.com/free-download/>) to create rich pictures 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.

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 minilecture 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.

Vensim Software: Highly recommended for the concept mapping/rich picture/causal loop work. Available for free download at <http://vensim.com/free-download/> (click that you are using it for educational purposes)

Manual about Causal Loop Diagrams (“CLD Course Participant Manual”): available on the Canvas Site. Required reading about how to use the Vensim software and in general how to do causal loop diagrams.

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”) (7)**

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 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 Vensim software to create their maps, although with permission of the instructor they may use other methods.

Group-project: causal loop diagrams and policy brief documents (1)

Each student will collaborate **once** with a group of 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 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]” [FAO Food Security Communications [Toolkit](#)]

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>). A draft of the causal loop diagram is due in Week 7. The final version and the write-up is due in **Week 10**.

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, and group collaboration in the group project are essential for successful instruction and learning in this course.

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>

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 classes, computers may 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		24%
• Weekly concept maps/rich pictures (7X5% each)		21%
• Exams		35%
o Midterm	(15%)	
o Final	(20%)	
• Group causal loop diagram and Policy brief		<u>20%</u>
Total		100%
• OPTIONAL: Field experience	Additive (5%)	

The instructor will provide evaluation--grading rubrics (based on the course learning objectives) in advance for all major assignments. Grading guidelines are adapted from Department of Health Services guidelines: [[link](#)]

- 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.

Diversity, inclusion and respect

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 promoting an inclusive environment and respecting the many social and cultural differences among us. These may include but are not limited to: race, ethnicity, age, cultural background, disability, family status, gender identity and presentation, citizenship and immigration status, national origin, religious and political beliefs, sex, sexual orientation, socioeconomic status, and veteran status.

Please talk with me right away if I fail to meet these or your expectations, or if you experience or witness disrespect in this class. I will work promptly to address it in a constructive and educational manner, while assuring your privacy. Alternatively, you could communicate your concerns through the Graduate Program director (Richard Fenske, rfenske@uw.edu) or Ms. Trina Sperry, or your chosen contact person in your department or the Dean's office.