

RISK ASSESSMENT FOR ENVIRONMENTAL HEALTH HAZARDS

SYLLABUS

Autumn Quarter, 2017

ENVH 577, PUBPOL 589, CEE 560

Elaine M. Faustman, PhD

Items to be discussed include:

1. Course Description
2. Class Schedule
3. Extra Credit Class Schedule
4. Description for Course Assignments
 - A. Memo to the Governor
 - B. Short Term Assays
 - C. Group Project Topics: Case Studies
5. Readings Table of Contents
6. Assignment and Reading Schedule

Risk Assessment
ENVH 577, PUBPOL 589, CEE 560
Autumn Quarter 2017
Tuesday/Thursday from 8:30am-10:20 AM
Room: More Hall (MOR) 234

<u>Date</u>	<u>Schedule</u>	<u>Session Leader</u>
September 28 th Thursday	Introduction Perceptions of Risk	Faustman (Remote)
October 3 rd Tuesday	Course Requirements – Review and Discussion Q & A with Tyler Nicholas, Bre Bennett Role of Non-Governmental Organizations (NGOs) Risk Perception Due: Choose short term essay to review Due: Review Risk Assessment Group Project Choices	Faustman Nicholas
October 5 th Thursday	Identification of Hazard I: Chronic Bioassay Due: Choose Risk Assessment Group Project	Faustman
October 10 th Tuesday	Identification of Hazard III: Epidemiological Principles	Faustman
October 12 th Thursday	Identification of Hazard II: Short Term and In Vitro Assays Assign Group Projects DUE: Short term essay assignment	Faustman
October 17 th Tuesday	Exposure Assessment	Faustman
October 19 th Thursday	Quantitative Risk Characterization I: Dose Response Assessment and Extrapolation to Low Dose Can Risk Assessment modeling be used for predicting public health impacts? Opportunities for Probabilistic Risk Assessment Modeling	Faustman
October 24 th Tuesday	Approaches for Microbial Risk Assessment of Zoonoses and Vectorborne Disease	Meschke
October 26 th Thursday	Quantitative Risk Characterization II: Approaches for Evaluating Uncertainty and Variability for Public Health	Faustman
October 31 st Tuesday	Pharmaceutical Risk Assessment Approaches: Balancing Risk and Benefits in Patients	Sprugel
November 2 nd Thursday	Ecological Risk Assessment: Practical Approaches to Ecosystems Assessment Lessons Learned from the U.S. EPA	Garry
November 7 th Tuesday	Context for Risk Communication and Case Examples	Faustman Nicholas Smith

November 9 th Thursday	Broadening our Concepts of Public & Environmental Health: Well-being, One Health and Sustainability Due: Quantitative Worksheet	Faustman
November 14 th Tuesday	Cyanobacteria and Soy Student Presentation	Faustman
November 16 th Thursday	Adverse Outcome Pathways: Translating Mechanistic Data	Nicholas
November 21 st Tuesday	Where Research Meets Practice: Developing innovative environmental policies in King County Hazardous Waste Site Risk Assessments	Whittaker Kinno Grimsted
November 23 rd Thursday	Thanksgiving Holiday	
November 28 th Tuesday	Civil Action TCE Case Study: Clash of the Titans Science vs. Regulation in the Courtroom Due: Memo to the Governor	Lewandowski
November 30 th Thursday	Particulates and MTBE Student Presentation	Faustman
December 5 th Tuesday	Hurricanes Student Presentation	Faustman
December 7 th Thursday	Putting Risk Assessment and Risk Management into Context: What have we learned? Need to learn? Thinking about Risk Management as Critical Infrastructure Due: Student Group Risk Assessment Project Papers	Faustman
December 12 th Tuesday	Final Exam 10:30am-12:20, MORE Hall 234	

Instructor: Dr. Elaine M. Faustman
Office Hours: By appointment
4225 Roosevelt Way NE, Suite 100, Rm. 208
Telephone: 206-685-2269
Email: faustman@uw.edu

Teaching Assistant: Tyler Nicholas
Office Hours: By appointment
Email: nicholat@uw.edu

Academic Integrity (<http://sph.washington.edu/students/academicintegrity>)

Students at the University of Washington (UW) 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.

UW Disability Statement (<http://depts.washington.edu/uwdrs/faculty-resources/syllabus-statement>)

Access and Accommodations: Your experience in this class is important to me. 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 (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. 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(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

Course Description

Risk Assessment for Environmental Health Hazards

Autumn 2017

4 credits

ENVH 577, CEE 560, PUBPOL 589

Elaine M. Faustman, Ph.D.



Risk Assessment is a lens through which you will learn to explore and tackle environmental and public health sciences problems and characterize risk within a broad public health context.

Risk Assessment is a transdisciplinary, multifaceted approach to solving public and environmental health science problems because it combines the key principles of exposure sciences (through assessment of exposure), toxicology (through hazard identification), and modeling (through dose-response assessment) to characterize risks from biological, chemical, or physical agents and public health situations. Risk management includes delineating options, making decisions, and taking actions to address the risks identified. Making decisions in the face of significant uncertainty is a key challenge to which risk assessment and risk management approaches can be applied. Risk communication identifies approaches to exchange information about risks to stakeholder groups.

Course Description

ENVH 577 “Risk Assessment for Environmental Health Hazards” is a graduate course that introduces students to the fundamentals of environmental risk assessment through a series of lectures, case examples, readings, assignments, and the final group project. Students learn to identify, characterize and predict environmental health risk for a spectrum of public and environmental health science problems. Prediction methods are taught and students will have an opportunity to use these approaches. Methods for evaluating uncertainty in such predictions are presented. Approaches for preventing and controlling potential risks are also included in the course content and this will involve discussion of legislative and regulatory options as well as risk communication techniques. Students will prepare a risk assessment within a group project setting.

Since risk assessment practice requires a transdisciplinary understanding across technical and social sciences, this course has transdisciplinary student participation which is exemplified by its listing in three schools. It is designed for students in public health in all of the 5 core disciplines. In addition, students in engineering and environmental disciplines (civil and systems) are key participants. It is also designed for students in law, policy, and risk management thus students in public affair provide essential context for risk assessment.

Through the use of case examples in all lectures and in the group project, students will become familiar with examples of chemical, physical and biological agents and will be able to understand the sources of such risks within the community. For example, media-specific (air, water, soil) as well as context-specific (food, occupational, medicine, etc.) factors will be included. Natural as well as man-made risks will be assessed. Lectures and student exercises will emphasize the significance of integrating information from core public health disciplines of environmental health, epidemiology, health policy management and social and behavioral sciences. Opportunities to participate in facilitated exercises and group discussions will be encouraged.

Course Credit: The course is a 4 credit course and class time will be used in a balance of didactic lectures as well as participatory exercises and discussion.

Course Objectives and Evaluation

Course Objectives

The course objectives include:

1. Identifying hazards and understanding the methodologies and types of data generated by public health studies (epidemiology, toxicology, etc)
2. Define risk assessment, describe the what, why and how of risk assessment, i.e., describing and differentiating the public health risks, benefits and costs of a particular action or chemical and thereby developing a framework for decision-making in environmental health and safety.
3. Characterizing the public health risks of a specific hazard by accounting for variables, differing sensitivities and uncertainties of analysis.
4. Identifying factors that contribute to the diversity of the response of human populations to environmental toxicants.
5. Prepare and present a group risk assessment project that identifies, characterizes, and manages an environmental, ecological, or occupational risk.
6. Define risk management and identify means to control risk including intervention as well as use of legislative and regulatory guidelines.
7. Effectively communicate environmental and public health risks and prevention strategies to potentially affected communities including culturally diverse populations.

Course Competencies

Upon completion of this course students shall be able to:

1. Describe and distinguish between risk assessment and management approaches.
2. Describe how risk information from core public health disciplines is integrated to identify potential health risks.

3. Describe and apply both qualitative and quantitative approaches to characterize the magnitude of environmental and public health risks.
4. Predict potential for human health risks using the risk assessment framework.
5. Identify key areas of uncertainty in risk predictions.
6. Describe risk management approaches for addressing (controlling and preventing) predicted risks including identifying legislative, regulatory and risk communication options.
7. Perform an environmental and public health risk assessment.

Course Evaluation

<u>Graded Assignments</u>	<u>Percentage of Grade</u>
Final Exam	25%
Student Project	50%
Oral Presentation and Student Project Critique (20%) Paper (30%)	
Memo to the Governor	20%
<u>Credit/No Credit assignments *</u>	
Short Term and Biomarker Assay Review	2%
Quantitative Worksheet examples	2%
Class Participation	1%
	100%

Text Books/Reading Materials

Required

1. ENVH 577 Readings (On Canvas site)
2. Harr, J., A Civil Action. Vintage Press, 1996 (on reserve at HS Library)

In some cases you will be asked to select from 1 or more from a group of reading options, and the selected reading are considered required assigned reading. However, in other cases readings listed are specified as optional or supplemental and are not considered required. Unless otherwise noted, readings listed serve as suggested readings that the student may wish to read if desired.

Readings/Slide Posting: All slides will be posted and we will use Panopto to record videos of all classes.

Academic Integrity (<http://sph.washington.edu/students/academicintegrity>)

Students at the University of Washington (UW) 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.

UW Disability Statement (<http://depts.washington.edu/uwdrs/faculty-resources/syllabus-statement>)

Access and Accommodations: Your experience in this class is important to me. 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 (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. 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(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.