

**ENV H 502: Assessing and Managing Risks from Human Exposure to
Environmental Contaminants (4 credits)**
Winter 2025

Instructors:

Marissa Baker, PhD, Assistant Professor (bakermg@uw.edu)
(she/her)

Department of Environmental & Occupational Health Sciences
Office: Roosevelt Building (4225 Roosevelt Way NE), 150C
Phone: 206-616-4709

Class: M, W 1:30pm-3:20pm, Health Sciences Education Building (HSEB) 245

****There is no final exam held during finals week****

The University of Washington acknowledges that the land we gather on to learn, teach, and grow is the native land of the Coast Salish people, the land which touches the shared waters of all tribes and bands within the Suquamish, Tulalip, and Muckleshoot nations.

Please note that all classes will be held only in-person. Classes will include group discussion and applied problems, making the in-class learning environment superior to trying to rely on recordings. Attempts may be made to record class, but there is no guarantee that content will be available (e.g., I could forget to record or the recording could fail). Please discuss with me if you think you need recordings of class sessions. If in-person class must be cancelled for any reason at the last minute, content will be recorded and put online, and I will communicate with you all openly.

Office Hours: TBD

Textbook: You will NOT need to buy any textbook for this course. All readings will be provided as PDFs or links to webpages on the Canvas page.

Overview

Exposure science provides the data needed to inform risk assessments and apply regulatory standards to a wide range of chemical, biological, psychosocial, and physical hazards. Exposure assessment tools have wide application in epidemiological studies and in evaluating health interventions. This course introduces techniques such as hazard identification, dose response estimation, sampling for chemical and biological hazards, the use of surveys in exposure assessment, exposure biomarkers and more as applied in both occupational and community environments.

Learning Objectives

At the end of this course, students will be able to:

1. Describe the major exposure pathways for occupational and environmental disease agents.
2. Apply basic box models to assess the fate and transport of environmental contaminants.
3. Contrast the relationship between exposure and dose for the dermal, oral, and respiratory routes of exposure.
4. Identify the public health agencies responsible for foundational environmental health regulations in the US and describe how they utilize exposure data for regulations and risk assessment.
5. Distinguish between exposure strategies used for epidemiology, risk assessment, and public health regulations.
6. Critique the strengths and limitations of exposure data collected through surveys, personal monitoring, area monitoring, and qualitative methods.
7. Apply the EPA Exposure Factors Handbook to construct plausible exposure scenarios

8. Summarize individual and group exposures with appropriate statistical descriptors and methods.
9. Apply the major components of the environmental and occupational risk assessment framework (problem formulation, hazard identification, dose-response assessment, exposure assessment, risk characterization, risk communication, risk management, evaluation, stakeholder engagement, and research) to address environmental public health problems experienced in the community or work environment
10. Use epidemiological and statistical techniques to describe and analyze environmental and occupational health data.

Accreditation Requirements & Competencies Met by This Course

Council on Education for Public Health (CEPH) competencies met by this course:

- Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health (D17.3)
- Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc. (D17.5)
- Explain effects of environmental factors on a population's health (D17.7)
- Explain biological and genetic factors that affect a population's health (D17.8)
- Explain behavioral and psychological factors that affect a population's health (D17.9)
- Explain the social, political and economic determinants of health and how they contribute to population health and health inequities (D17.10)
- Use epidemiological and statistical techniques to describe and analyze environmental and occupational health data (MS-EHS department-level competency)

Courses since the start of COVID

I understand that higher education has changed since COVID-19, and the expectations of students and instructors has changed. I also recognize that you (and I) may encounter unexpected challenges during this quarter. That includes challenges related to health and illness, technology, caregiving responsibilities, work responsibilities, and more. My goal this quarter is to support you in doing the best work you can in light of the challenges you face. I encourage you to remember that your health and well-being are far more important than the work you do in this class or any class, and I encourage you to take the time you need to care for yourself and your loved ones.

If you are finding it difficult to balance your health and well-being with your work in this class, please let me know. It is ok to ask for help and to acknowledge when you are struggling, and I am happy to help connect you with resources and services through campus and also make accommodations to our course plan as needed. I am accessible by email, and I will do my best to respond to messages within 24 hrs.

I also ask that you be patient with me if the challenges of this quarter force me to make last-minute changes to the course plan. I will do my best to communicate any changes clearly, and make them with respect for the inconvenience, frustration, and confusion that change may cause.

Course Format

All content will be delivered in person in live sessions. I may attempt to record some sessions, but this is an in-person class and there is no guarantee that there will be recordings for every session. **You are encouraged to attend in person for the best learning experience. Please discuss with Dr. Baker if you need recordings.**

Assessments

Student mastery of material will be assessed a variety of ways over the course of the quarter. The intended point allocations for this course are below. Please keep in mind that assignments and their point allocation are subject to change at instructor discretion throughout the quarter. There is no final exam during finals week in this course, but there is a final activity.

Group presentation—10%

HW 1—15%

HW 2—15%

HW 3—15%

Endterm take home exam—25%

In-class activities discretionary points—5%

Final Group Activity (Exposure Assessment Assignment)—15%

Readings

Any required readings for this course will be provided as a PDF on the Canvas webpage, or as a link to a publicly-accessible webpage.

Late Assignment Policy

I have set target completion dates for all quizzes/exercises/homework that are at least one week after it has been posted on Canvas. In order to keep up with the course, it is important that you try to meet these deadlines. However, if you need an extension for any reason, please contact the instructor to discuss your options. If you let me know what's up, it is highly likely you will not be docked any points.

Access and Accommodations:

Your experience in this class is important to me. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you have already established accommodations with Disability Resources for Students (DRS), please activate your accommodations via myDRS so we can discuss how they will be implemented 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), contact DRS directly to set up an Access Plan. DRS facilitates the interactive process that establishes reasonable accommodations. Contact DRS at disability.uw.edu.

Academic Integrity

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, unauthorized use of artificial intelligence (AI) tools, and other misconduct are serious violations of the [University of Washington Student Conduct Code \(WAC 478-121\)](#). 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](#).

Use of Generative Artificial Intelligence in this Course

There are a variety of AI programs available to assist us as writers and researchers, but AI programs are not a replacement for human creativity, originality, and critical thinking. While you are permitted to use AI tools in gathering information, writing drafts, and revising your assignment, you will be asked to disclose on each assignment how you used AI for that assignment. This is meant to encourage your development of appropriate attribution skills, reflect upon your use of generative AI, and protect you in the event of an academic misconduct inquiry. AI tools will not be a replacement for proper citation/attribution. Assignments will have further guidance on how to properly disclose the use of AI on that particular assignment.

Winter Respiratory Illness—Protocols and Safety

If you feel ill or exhibit respiratory or other symptoms, you should not come to class. Seek medical attention if necessary and notify your instructor(s) as soon as possible by email. [UW Environmental Health & Safety](#) recommends that you wear a well-fitting mask while you are symptomatic.

Additional recommendations include getting your [annual flu shot](#) and getting boosted with the updated COVID vaccines (available [at clinics and pharmacies, as well as through UW Medicine](#) and local health agencies).

Please check your email and Canvas announcements daily BEFORE coming to class. If we need to conduct class remotely because the instructor or a guest speaker is unable to attend in person, we will send all registered students an email and/or post a Canvas announcement with a Zoom link for remote instruction or a plan for making up the class.

Religious Accommodations

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at [Religious Accommodations Policy \(https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/\)](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form \(https://registrar.washington.edu/students/religious-accommodations-request/\)](https://registrar.washington.edu/students/religious-accommodations-request/).

Course Schedule (Subject to change)

Date	Session Topic	In class activities	Out of Class Assignments
1: Mon 1/6/25	Course intro/what is exposure assessment?		HW 1 released
2: Wed 1/8/25	How exposure assessment informs public health (Exposure Regulations)	Group practice problems	
3: Mon 1/13/25	Exposure data sources/exposure factors handbook	Group practice problems	
4: Wed 1/15/25	Air Sampling for Chemical/Particulate Exposures	Group practice problems	
Mon 1/20/25	No Class: MLK Jr. Day		
5: Wed 1/22/25	Chemical Exposures (Data analysis and Interpretation)	Red Group Presentation	HW 1 due, HW 2 released
6: Mon 1/27/25	Chemical Exposures (Box and Plume models)	Orange Group Presentation	
7: Wed 1/29/25	Exposure Assessment Considerations for Epidemiology	Yellow Group Presentation	
8: Mon 2/3/25	Dermal/Ingestion Exposures	Green Group Presentation	
9: Wed 2/5/25	Qualitative Methods (Errett)		HW 2 due, HW 3 released
10: Mon 2/10/25	Biological Agents 1 (Meschke)		
11: Wed 2/12/24	Biological Agents 2 (Meschke)		
Mon 2/17/25	No Class: President's Day		
12: Wed 2/19/25	Assessing physical exposures	Blue Group Presentation	HW 3 due Endterm released
13: Mon 2/24/25	Assessing psychosocial exposures	Indigo Group Presentation	
14: Wed 2/26/25	The use of surveys/questionnaires for exposure assessment	Violet Group Presentation	
15: Mon 3/3/25	Biomonitoring for exposure assessment		
16: Wed 3/5/25	Collecting Exposure Data in the Field: Panel discussion	Panel questions Group work time	

Date	Session Topic	In class activities	Out of Class Assignments
17: Mon 3/10/25	Group Work Session	Work on exposure assessment assignment	Endterm due
18: Wed 3/12/25	Communicating exposure risk	Work on exposure assessment assignment	
Wed 3/19/25	Finals Week		Exposure Assessment Assignment Due

Grades for this course

Grades for this course will be assigned based on the table below. Rounding will be done at the instructor's discretion.

Lower Percent Cut-Off	Assigned GPA
≥98	4.0
≥96.4	3.9
≥94.9	3.8
≥93.3	3.7
≥91.7	3.6
≥90.2	3.5
≥88.6	3.4
≥87	3.3
≥85.5	3.2
≥83.9	3.1
≥82.3	3.0
≥80.8	2.9
≥79.2	2.8
≥77.7	2.7
≥76.1	2.6
≥74.5	2.5
≥73	2.4
≥71.4	2.3
≥69.8	2.2
≥68.3	2.1
≥66.7	2.0
≥65.1	1.9
≥63.6	1.8
≥62	1.7
<62	0.0