UNIVERSITY of WASHINGTON
SCHOOL OF PUBLIC HEALTH

Course Syllabus
ENVH 512, Environmental and Occupational Health for Public Health Practitioners

Winter 2025 (3 credits)

Instructor

Name: Anne Riederer, ScD, MSFS, MS
Email: anneried@uw.edu
***Note**: for questions regarding the course, please contact Anne via the Canvas inbox.*
Pronouns: she/her/hers
Office hours: by appointment

About the Instructor

Anne M. Riederer (she/her), MS, MSFS, ScD

Clinical Associate Professor, Department of Environmental & Occupational Health Sciences

Dr. Riederer is an environmental health scientist focused on assessing exposures of young children and pregnant women to heavy metals, pesticides, air pollution, and other environmental neurotoxicants. Her work involves sampling and analysis of pesticides, heavy metals, and other toxicants in clinical and environmental samples, and analysis of large biomarker data sets (e.g., the U.S. National Health and Nutrition Examination Survey [NHANES]). She also holds adjunct faculty appointments at George Washington University and Emory University where she was Research Assistant Professor and Co-Director of the Global Environmental Health MPH Program from 2004-2010. Since 2006, she has served on the Technical Advisory Board of Pure Earth, a non-profit organization dedicated to cleaning up hazardous waste sites in low- and middle-income countries (LMICs). From 2010-2012, she was an American Association for the Advancement of Science and Technology Policy Fellow, hosted by the Assistant Administrator for Research and Development at U.S. EPA, where she helped develop policies on clean cookstoves, e-waste, and critical materials recycling. From 1991-1998, she was a senior associate for Hagler Bailly Consulting, managing their Manila, Philippines office from 1994-1998, where she was responsible for helping LMIC governments develop air, water, and hazardous waste regulatory programs and climate change mitigation strategies on behalf of clients such as USAID, the World Bank, the Asian Development Bank, and others. She holds a BS

(Neuroscience) from Brown University, an MS (Foreign Service) from Georgetown School of Foreign Service, and an MS (Environmental Science and Engineering) and ScD (Environmental Health) from the Harvard T.H. Chan School of Public Health. She lives in Seattle, WA, with her husband and two children.

Course Description

This three-credit course provides a graduate-level overview of the multidisciplinary field of environmental and occupational health (EOH) sciences. Building on concepts and knowledge introduced in the Determinants of Health and other introductory MPH courses, it covers a broad spectrum of environmental hazards and contexts, their interactions with human health and well-being, and their relevance to the effective assurance and promotion of public health. We will consider environmental and occupational challenges in different settings (e.g. home, community, workplace) and at varying scales (local, regional, and global), using case examples from low-, middle-, and high-income countries, including the United States. Students will learn how to evaluate environmental health concerns using the traditional EOH disciplines of toxicology, exposure science, EOH epidemiology, and EOH microbiology within the context of social, economic, and other health determinants, and consider policy solutions to environmental and occupational health concerns.

This course should be useful for public health and health care professionals, environmental scientists and engineers, public administrators, or any student who wants a broad overview of relationships between the environment and human health in a wide range of contexts.

Course Learning Objectives

Integrative competencies: At the end of this course, students should be able to:

1. **Foundations:** Describe and discuss foundational concepts and strategies of environmental and occupational health sciences and draw generalizable conclusions about how they apply in different situations and at various scales.
2. **Global Health:** Contrast environmental and occupational health problems between higher-income and lower-income populations, and discuss impacts of global social, economic and environmental trends on environmental public health.
3. **Contexts and Systems:** Apply foundational concepts and strategies to EOH problems from a systems perspective; and characterize broader environmental and social contexts and complex system dynamics.
4. **Policy:** Develop evidence-based and sustainable strategies to improve health, well-being and equity related to an EOH problem.
5. **Communication:** Communicate information in plain language to a target audience about environmental and occupational health risks, influential factors, and prevention strategies.
6. **Professionalism:** Perform effectively in groups and on small teams; promote collegiality, inclusion, trust, and ethical principles in learning experiences.

Supportive learning objectives: At the end of the course, students should be able to:

1. Foundations

- Hazards: Specify major (representative) chemical, microbial, and physical health hazards found in air, water, food, soil, house dust, and waste; and describe their principal effects on health and interactions with biological and genetic health determinants.
- Cycles: Characterize energy, hydrological, and other major cycles relevant to public health and describe these cycles in terms of sustainability and system dynamics.
- Exposures: Describe basic strategies for identifying, evaluating, preventing, and controlling exposures to health and safety hazards in environmental and occupational settings.
- Health risks: Describe basic strategies to assess EOH health risks and identify acceptable levels of risk associated with environmental hazards.
- Vulnerability: Discuss the importance of factors that contribute to individual and population vulnerability, such as biological susceptibility, existing health or social disparities, and cumulative burden of health impacts.
- Values: Discuss the importance of equity, justice and sustainability in addressing problems related to the environment and health.

2. Global Health

- Contrasts: Compare and contrast environmental health problems and applicable policies among low-, middle-, and high-income populations, and settings.
- Trends: Describe and discuss potential impacts of demographic changes, economic development, energy demand, human-modified environments, global-scale pollution, and global environmental change on human health, water security, food security, and equity.

3. Contexts and Systems

- Environmental context: Identify and discuss how the current or changing status of natural ecosystems and human-altered environments might influence health, well-being, and equity.
- Systems: Identify and describe the scope, scale, and dynamics of major systems relevant to environmental and occupational health; describe impacts of these systems and their dynamics on health.
- Social context: Identify and discuss how socioeconomic, political, cultural, behavioral and perceptual factors might interact with environmental factors and influence health risks.
- Systems thinking: Examine relationships between system structure and dynamics, environmental hazards, social contexts, and vulnerability on health, wellbeing, and equity; and discern how complex system dynamics complicate management of associated risks.

4. Policy

- Stakeholders: Identify stakeholders; characterize assets, power and inequities, and anticipate needs, concerns, and risk perceptions.

- Opportunities: Identify opportunities for and barriers to sustainable changes that promote health, well-being, and equity.
- Alternatives: Formulate evidence-based, context-appropriate, and sustainable alternatives to address the problem and enhance health, wellbeing, and equity.

Council for Education of Public Health (CEPH) Competencies

The School of Public Health (SPH) is accredited by the Council on Education for Public Health (CEPH). Students in the Online MPH program will meet the following degree competency(s) in this course and will be assessed as indicated:

- N/A

For additional information on the 2020 SPH CEPH accreditation please visit the SPH's CEPH Accreditation webpage. https://sph.washington.edu/about/ceph-accreditation

Required Course Materials

Frumkin H, editor. Environmental Health: From Global to Local. 3rd ed. San Francisco, CA: Jossey-Bass; 2016.

Note: This book is available as an e-book for free through the University of Washington Libraries. To access it, search by title using the UW Libraries search. Or you can use this link. You will be prompted to login with your UW Net ID to access the book.

- ***Please note:*** Mac computer users may find it easier to access the book using the Safari internet browser. (Some issues have been reported with Google Chrome for Mac.)

Additional course materials will include journal articles, videos, and other materials. These will be posted on the course Canvas site.

Learning Assessments & Grading

To be successful in the course you will need to complete all the learning activities listed.

Final grades will be calculated as follows:

Assessment	*Grade Percentage*
Quizzes	40%
Module activities	10%
Synchronous session activities (Small Group Exercises [SGEs])	15%
Midterm Exam	15%
Final Exam	20%
Total	**100%**

The Online MPH program follows the UW Graduate School Policy on Graduate Degree Requirements (Policy 1.1.1) and the Department of Health Services Grading Policy. Information

about the Grading System is available in the course Canvas site on the Modules page under "Introduction."

Activities, Assignments & Assessments

Module Learning Objectives

We will cover a lot of ground in this course! The learning objectives at the beginning of each module section are your guide to the most important things we want you to take away from the material. Please read carefully through them, several times, before you start each section. This will help cue your brain to the most important items before you start viewing.

The learning objectives are your key to success on the exams and will help the content feel less overwhelming. You can even turn them into study guides, for taking notes while viewing content and doing the readings, and to prepare for the exams.

Knowledge Checks

Knowledge checks are interspersed throughout most modules. They provide a way to test your learning and practice for the module quizzes. They are not graded and do not count toward your course grade but do your best to complete them because you will see related questions on the exams.

Module Quizzes

Most modules also include a quiz. These quizzes make up 40% of your grade. You can take each quiz twice and your highest score will be saved. These quizzes are open book and must be completed individually. Use of Artificial Intelligence (AI) tools (such as ChatGPT, Copilot, etc.) during quizzes is prohibited.

Module Activities

In many of the modules, you will be asked to complete activities that give you additional opportunities to dive deeper into the topic you are learning. Some module activities are graded credit/no credit and others will receive a numerical grade. See the assignment page for each module activity page for details. These make up 10% of your course grade.

Synchronous Session Activities

The live class sessions are held on **Tuesday evenings**. These sessions provide opportunities to practice what you've learned in the asynchronous materials in small group activities, to learn from each other, and to ask questions. You can find details on how to prepare for each synchronous session on Canvas.

Please plan to attend the entire live session. If you are not able to attend a session, please contact the instructor in advance.

During synchronous sessions, you will work together to complete guided small group exercises [SGEs] that are a culmination of materials learned during the week. The SGEs are designed to

reinforce learning the course content in collaborative, fun, and low stakes ways. Synchronous session activities are group assignments that will receive a numerical grade. See the assignment page for each synchronous session for details. These activities make up 15% of your course grade.

- **January 14**, 8pm
- **January 21**, 7pm
- **February 4**, 7pm-9pm (2-hour session)
- **February 11**, 8pm
- **March 4**, 8pm
- **March 11**, 7pm

Exams

This course includes a midterm given during Week 7, and a final exam during the last week of the course (Week 11). These exams are open book. Combined, they make up 35% of the course grade (midterm 15%; final 20%). The final exam is not cumulative in the traditional sense, but it will draw on the EOH disciplines content in the Toxicology, Exposure Science, and EOH Epidemiology modules. Use of Artificial Intelligence (AI) tools (such as, but not limited to, ChatGPT, Copilot, etc.) during exams is prohibited.

Citing Sources and avoiding Plagiarism

You are required to cite your sources clearly for each written assignment. In assignments where you are reviewing specific article(s), please include the complete bibliographic reference for each article. You can review the page on Citation Style and Citation Management as needed. Try as much as possible to use your own language when reviewing these articles, and if you must quote directly from a paper, be sure to place the quote in quotation marks and include the page number in the in-line citation. (Example: Raz et al., 266.)

You are encouraged to review the resource page on Plagiarism.

TurnItIn has been enabled where noted.

Late Work Policy

If you are unable to turn in an assignment by the due date, please email the teaching team **in advance** to request an extension and specify duration. You do not need to state a reason for the extension. It is at the discretion of the instructor to approve the duration of the extension. If assignments are turned in late, without prior discussion with one of the instructors, a late penalty will be determined at the discretion of the instructors.

Class Time & Work Expectations

For this **3-credit hour course**, students are expected to spend **9 hours per week** on learning activities. Each learning activity will be given a time estimate that will be noted in Canvas.

https://registrar.washington.edu/curriculum/assigning-credit/

To get the most out of this online course, students are highly encouraged to:

- Log in to their courses frequently to check their required readings, activities, and assignment deadlines
- Maintain a regular academic schedule to keep the workload manageable
- Actively participate in classroom discussions and activities
- Contact the instructor if they are unable to meet an assignment deadline or are experiencing other issues in the course.

Course Outline

Week	Module Topic	Activities & Deliverables
Week 1 *Jan. 6 – 12*	**Introduction; EOH Disciplines: Toxicology, Epigenetics & Risk Assessment**	*No synch session* Due January 12: • Module 1 Quiz • Choose your poison activity
Week 2 *Jan. 13 – 19*	**EOH Disciplines; Exposure Science & EOH Epidemiology**	Synch Session: January 14 Due January 19: • Module 2 Quiz
Week 3 *Jan. 20 – 26*	**Energy and Ambient Air Pollution**	Synch Session: January 21 (Raz et al. review exercise) Due January 21, 7:59pm PT: • Module 3 Quiz Due Weds, Jan 22: • Small Group WoE Part 1: Critique of Raz
Week 4 *Jan. 27 – Feb. 2*	**Household Air Pollution**	*No synch session* Due Sun, February 2: • Primary Study Review, Parts 1 & 2 • Module 4 Quiz: Air Pollution
Week 5 *Feb. 3 – 9*	**Honing your Epi Evidence Skills**	Synch Session: February 4 (2 hours) (Four study review activity) Due Weds, Feb 5: • Small Group WoE Part 2: Four study review

Week	Module Topic	Activities & Deliverables
		Due Sun, February 9: • Mid-Course Survey (optional)
Week 6 *Feb. 10 – 16*	**Climate and Health Updates; RCTs in EOH**	Synch Session: February 11 Due Sun, February 16, 7:59pm PT: • Module 6 Quiz: HAPI Trial
Week 7 *Feb. 17 - 23*	**Midterm Exam**	*No synch session* Due February 23: • Midterm Exam
Week 8 *Feb. 24 – March 2*	**Water, Sanitation, and Hygiene**	*No synch session* Due Sun, March 2: • M8 Quiz: Microbiology Refresher • M8 Quiz: WASH • EOH Interventions: PICO Exercise Homework
Week 9 *March 3 - 9*	**Solid and Hazardous Waste**	Synch Session: March 4 (In-class PICO Exercise) Due Weds, March 5: • Small Group Exercise: EOH Randomized Intervention Trial Design Due Sun, March 9: • M9 Quiz: Lead Interventions, Part 1 & Part 2
Week 10 *March 10 - 16*	**Occupational Safety and Health in the United States and Abroad**	Synch Session: March 11 Due Sun, March 16: • *No items due this week; study/prepare for final exam*
Week 11 ***Finals*** *March 17 - 21*	**Finals Week**	*No synch session* Due March 21: • Final Exam

Zoom Privacy Statement

This course has scheduled synchronous sessions via Zoom. These Zoom class sessions may be recorded. If recorded, the recording will capture the presenter's audio, video and computer screen. Student audio and video will be recorded if they share their computer audio and video during the recorded session. The recordings will only be accessible to students enrolled in the course to review materials. These recordings will not be shared with or accessible to the public.

The University and Zoom have FERPA-compliant agreements in place to protect the security and privacy of UW Zoom accounts. Students who do not wish to be recorded should not share their computer audio or video during their Zoom sessions.

Land Acknowledgement

The UW School of Public Health and ENVH 512 teaching team acknowledge the land we occupy today as the traditional home of the Coast Salish people, including the Tulalip, Muckleshoot, Duwamish and Suquamish tribal nations. Without them we would not have access to this working, teaching and learning environment. We humbly take the opportunity to thank the original caretakers of this land **who are still here**.

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 Coursework

The instructor(s) understand that **generative artificial intelligence (AI) tools** (such as Chat GPT, Google Bard, or similar programs) may be helpful to you in some cases, such as for explaining difficult concepts or gathering information. However, extensive use of such tools to write drafts or revise your work is not acceptable and constitutes academic misconduct. Do not copy and paste AI outputs directly into discussion board posts or submit the output as an assignment. Do not copy and paste an assignment prompt or instructions into an AI tool. Use of generative AI tools is prohibited for quizzes and exams.

If you choose to use AI tools in this class, please use with caution and review any AI outputs critically before including in your academic work. In addition, **you are required to do the following:**

1. Use track changes to demonstrate how much of the written product was written by generative AI, and how much was written by you.
2. Maintain a history within the AI tool of your prompts and outputs (for example the chat history in ChatGPT) and provide to the instructor if requested.
3. Provide a written statement as part of your assignment that includes the following:
    a. Describe how you used generative AI in the assignment or project.
    b. Describe how you verified outputs were correct or true.

c. Provide a reflection on how using generative AI tools befitted you or potentially harmed the learning goals of the assignment.
d. Attest that you did not put any protected data into an AI tool during your completion of the assignment; including copyrighted materials, the intellectual property of others (including papers written by others, **or the text of your instructor's assignment instructions**), research or study data, interview transcripts, or personal information of others.

These activities are meant to a) encourage your development of appropriate attribution skills, b) reflect upon how generative AI is contributing to or harming your learning, and c) protect you in the event of an academic misconduct investigation.

Diversity and Inclusion

Diverse backgrounds, embodiments and experiences are essential to the critical thinking endeavor at the heart of university education. In SPH, students are expected:

1. To respect individual differences, which may include, but are not limited to, age, cultural background, disability, ethnicity, family status, gender, immigration status, national origin, race, religion, sex, sexual orientation, socioeconomic status, and veteran status.
2. To engage respectfully in the discussion of diverse worldviews and ideologies embedded in course readings, presentations, and artifacts, including those course materials that are at odds with personal beliefs and values.
3. To encourage students with concerns about classroom climate to talk to their instructor, adviser, a member of the departmental or SPH EDI Committee, the Assistant Dean for EDI, or the program's director.

The teaching team is committed to making this class an equitable learning environment. Please talk with the instructor right away if you experience disrespect in this class from other students and/or from an instructor, and we will work to address it in an educational manner.

Statement on Classroom Climate

We are co-creators of our learning environment. It is our collective responsibility to develop a supportive learning environment for everyone. Listening with respect and an open mind, striving to understand others' views, and articulating your own point of view will help foster the creation of this environment. This applies to both synchronous session as well as discussion boards and other interactive fora. We engage our differences with the intent to build community, not to put down the other and distance ourselves from the other. Being mindful to not monopolize discussion and/or interrupt others will also help foster a dialogic environment.

The following guidelines can add to the richness of our discussion:

- We assume that individuals are always doing the best that they can, including the individuals in this learning environment.

- We acknowledge that systematic oppression exists based on privileged positions and specific to race, gender, class, religion, sexual orientation, and other social variables and identities.
- We posit that assigning blame to persons in socially marginal positions is counter-productive to our practice. We can learn much about the dominant culture by looking at how it constructs the lives of those on its social margins.
- While we may question or take issue with another class member's ideology, we will not demean, devalue, or attempt to humiliate another person based on their experiences, value system, or construction of meaning.
- We have a professional obligation to actively challenge myths and stereotypes about our own groups and other groups so we can break down the walls that prohibit group cooperation and growth.

[Adapted from Lynn Weber Cannon (1990). Fostering positive race, class and gender dynamics in the classroom. Women Studies Quarterly, 1 & 2, 126-134.]

We are a learning community. As such, we are expected to engage with difference. Part of functioning as a learning community is to engage in dialogue in respectful ways that supports learning for all of us and that holds us accountable to each other. Our learning community asks us to trust and take risks in being vulnerable.

Here are some guidelines that we try to use in our learning process:

- LISTEN WELL and be present to each member of our group and class.
- Assume that I might miss things others see and see things others miss.
- Raise my views in such a way that I encourage others to raise theirs.
- Inquire into others' views while inviting them to inquire into mine.
- Extend the same listening to others I would wish them to extend to me.
- Surface my feelings in such a way that I make it easier for others to surface theirs.
- Regard my views as a perspective onto the world, not the world itself.
- Beware of either-or thinking.
- Beware of my assumptions of others and their motivations.
- Test my assumptions about how and why people say or do things.
- Be authentic in my engagement with all members of our class.

Bias Concerns

The Office of the Dean has a student concern policy, a faculty concern policy and standard HR procedures for staff concerns. Our 2018 climate survey states that most people in SPH do not report bias incidents because they do not know where to go. Students are encouraged to report any incidents of bias to someone they feel comfortable with, including instructors, advisers or department staff. They can email dcinfo@uw.edu for immediate follow up. Bias concerns can be anonymously and confidentially reported via the online form found here: https://sph.washington.edu/about/diversity/bias-concerns. Data is collected by the Assistant Dean for EDI and the Director of Program Operations for Student and Academic Services and tracked for resolution and areas are identified for further training.

Sexual Harassment

Sexual harassment is a form of harassment based on the recipient's sex that is characterized by:

1. Unwelcome sexual advances, requests for sexual favors, or other verbal or physical conduct of a sexual nature by a person who has authority over the recipient when:
    - Submission to such conduct is an implicit or explicit condition of the individual's employment, academic status, or ability to use University facilities and services, or
    - Submission to or rejection of the conduct affects tangible aspects of the individual's employment, academic status, or use of University facilities.
2. Unwelcome and unsolicited language or conduct that creates an intimidating, hostile, or offensive working or learning environment, or has the purpose or effect of unreasonably interfering with an individual's academic or work performance.

If you believe that you are being harassed, or have observed harassment, you can report it to SPH using the bias concerns link. The University also has designated offices to help you: SafeCampus; Office of the Ombud; Title IX Investigation Office; and University Complaint Investigation and Resolution Office.

Access and Accommodations

Your experience in this class is important to the teaching team. 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.

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/).

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/)."

Pronouns

We share our pronouns because we strive to cultivate an inclusive environment where people of all genders feel safe and respected. We cannot assume we know someone's gender just by looking at them. So we invite everyone to share their pronouns.

Communication and Writing Skills

Writing is an important transferable skill for all career pathways. Establishing a strong foundation in writing skills will help you be successful throughout your future course work and career. Therefore, this course includes written assignments with the goal to help you identify areas of strength and improvement in your writing. However, if you feel that you could benefit from additional opportunities to improve your writing skills, a list of resources at the UW and others accessible online can be found on the SPH website.

Guidance for Students Taking Courses Outside the United States

Faculty members at U.S. universities – including the University of Washington – have the right to academic freedom which includes presenting and exploring topics and content that other governments may consider to be illegal and, therefore, choose to censor. Examples may include topics and content involving religion, gender and sexuality, human rights, democracy and representative government, and historic events.

If, as a UW student, you are living outside of the United States while taking courses remotely, you are subject to the laws of your local jurisdiction. Local authorities may limit your access to course material and take punitive action towards you. Unfortunately, the University of Washington has no authority over the laws in your jurisdictions or how local authorities enforce those laws.

If you are taking UW courses outside of the United States, you have reason to exercise caution when enrolling in courses that cover topics and issues censored in your jurisdiction. If you have concerns regarding a course or courses that you have registered for, please contact your academic advisor who will assist you in exploring options.

Statement on SimCheck (Turnitin)

The University has a license agreement with SimCheck, an educational tool that helps prevent or identify plagiarism from Internet resources. Your instructor may use the service in this class by requiring that assignments are submitted electronically to be checked by SimCheck. The SimCheck Report will indicate the amount of original text in your work and whether all material that you quoted, paraphrased, summarized, or used from another source is appropriately referenced.

Copyright Statement

education. For example, you may download materials to your computer for study, but you may not copy the materials and distribute or upload to a website. Such “fair use” by you does not include further distribution by any means of copying, performance or presentation beyond the circle of your close acquaintances, student colleagues in this class and your family.