

ENVH 440 and 545: Water, Wastewater, and Health

Fall Quarter, 2022

Tuesday, 2:00-3:20 Room: HSEB 345

Thursday, 2:00-3:20 Room: HSA A420

INSTRUCTORS: Karen Levy (klevyx@uw.edu)

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OFFICE HOURS: By Appointment

COURSE DESCRIPTION

This course will review the various aspects of domestic and global water and wastewater systems as they relate to human health. Topics covered will include source water, basic treatment technologies for water and waste, chemical contaminants, microbial contaminants, and recreational water. This course will be of use for public health professionals, microbiologists, civil and environmental engineers, and environmental scientists.

COURSE OBJECTIVES

On completion of this course, all students should be able to:

1. Identify and describe regulatory frameworks pertaining to water and wastewater.
2. Recognize, characterize, and categorize waterborne contaminants, their sources, and health effects.
3. Summarize and discuss centralized treatment approaches for water and wastewater.
4. Identify and describe decentralized alternatives for water and wastewater treatment.
5. Demonstrate and discuss the impacts of water on personal and community health.

Additionally, graduate students should be able to:

1. Critically review the scientific and gray literature on water and wastewater issues,
2. Compare and contrast alternative solutions to water and wastewater problem scenarios, and
3. Outline, recommend, and justify available solutions.

TEXTS AND REFERENCES

There is no required text for this course. Reading assignments and course materials will be provided through Canvas.

COVID-RELATED EXPECTATIONS

All UW students are expected to follow [state](#), [local](#), and [UW](#) COVID-19 policies and recommendations.

Please be extra conscientious about masking during the first few weeks of the quarter, because we will have a lot of members of the community traveling and can reasonably expect to see a surge in COVID cases.

If you feel ill or exhibit possible COVID symptoms, you should not come to class. If you need to temporarily quarantine or isolate per CDC guidance and campus policy, you are responsible for notifying your instructors as soon as possible by email. *If you receive a positive COVID-19 test result, you must report to campus Environmental Health & Safety (EH&S) by emailing covidehc@uw.edu or calling 206-616-3344.*

Please check your email daily BEFORE coming to class. If we need to conduct class remotely because the instructor or a guest speaker is complying with UW policies and unable to attend in person, we will send all registered students an email with a Zoom link for remote instruction. Please also keep an eye out for email communications from the University or the School of Public Health that will inform you of any future changes to policies or guidelines.

ACCESS AND ACCOMMODATIONS

Your experience in this class is important to us. 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 (Links to an external site.).

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](#) (Links to an external site). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form](#) (Links to an external site).

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, and other misconduct are serious violations of [the University of Washington Student Conduct Code](#) (Links to an external site.)(WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and [the SPH Academic Integrity Policy](#) (Links to an external site.). 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.

SPH LAND ACKNOWLEDGMENT

The University of Washington acknowledges the Coast Salish people of this land, the land which touches the shared waters of all tribes and bands within the Duwamish, Suquamish, Tulalip and Muckleshoot nations.

CLASSROOM CLIMATE

The UW School of Public Health seeks to ensure all students are fully included in each course. We strive to create an environment that reflects community and mutual caring. We encourage students with concerns about classroom climate to talk to your instructor, your faculty or academic advisor, or a member of the departmental or SPH Diversity Committee. Victoria Gardner (vg@uw.edu), SPH Assistant Dean for Equity, Diversity & Inclusion, is also a resource for students with concerns related to equity, diversity, and inclusion.

EQUITY, 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.

BIAS CONCERNS

The Office of the Dean has a [student concern policy](#) (Links to an external site.), 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 at this link <https://sph.washington.edu/about/diversity/bias-concerns> (Links to an external site.). 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.

PERSONAL PRONOUNS

According to the UW First Year Programs, being an ally is not just about intention, it's also about behavior. 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. Dr. Levy and TA Miller use she/her pronouns. Dr. Meschke uses he/him pronouns.

GRADING:

For the sake of this class, letter and numerical grades will typically be distributed according to the university grading scale between the following standards:

A (4.0) = Excellent and exceptional work (typically >>95% of available points)

D (1.0) = Deficient work (typically <66% of available points)

It is expected that most students will perform at a level of ~3.5.

Points will be available according to the following percentage breakdown:

Item	#	440 (undergrad)		545 (graduate)		Notes
		Points	% of Grade	Points	% of Grade	
Intro assignment	1	2	2%	1	1%	Video introduction – who you are, why you are taking the course, and where your water comes from now or when you were growing up
Quizzes	7	3 pts each	21%	2 pts each	14%	Quiz assignments will cover lectures, reading, and pre-recorded lectures. Late quizzes will be penalized 10% of point value for each class period that they are late. Quizzes covering the prior week's material will open on Monday and be due on Thursday.
Midterm	1	20 pts	20%	20 pts	20%	The midterm exam will consist of short answer and multiple choice questions. Exam will be given online and will be open book and open note, but students should not consult with any other people while answering the questions.
Group Discussions	6	3 pts each	18%	2 pts each	12%	Students are expected to participate in group discussion and learning activities. These will consist of 3 journal clubs, 2 <i>In the News</i> activities and attendance/report back for one session of the UNC Water and Health Conference. There will be options each week for participating in discussions through a) in-person discussions during scheduled class time; or b) online asynchronous discussion boards.
Questions for guest lecturers	5	1 pt each	5%	1 pt each	5%	Students are expected to submit questions for the speaker at least 24 hours in advance of each of the guest lectures.
Policy Assignment	1	10	10%	8	8%	Students are expected to review the Bipartisan Infrastructure Act and propose how Seattle/King County should prioritize funds to improve the water system.
Applied scenario project	1	4 pts	4%	20 pts	20%	440 students: Undergraduates are expected to attend graduate student presentations and formulate 5 questions for the speaker. 545 students: Graduate students will develop short presentation (5-7 minutes) that includes a critical review of the relevant literature and potential solutions to a specific scenario (of their choosing), in which health has been impacted by waterborne contaminants. Presentations will be made in person unless other arrangements are needed for an online presentation. Graduate students will present and respond to questions on their presentation during the last 2 weeks of class.
Final Exam	1	20	20%	20	20%	The final exam will be offered during finals week.

						<p>The final exam will be a similar format to the midterm exam, and will be comprehensive of all material covered in the course, weighted more heavily to material covered since the midterm. Exam will be given online and will be open book and open note, but students should not consult with any other people while answering the questions.</p>
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COURSE SCHEDULE

Day of Week	Date	Topic	Speaker/Lead	In-class Activity	Homework
Thurs	9/29	Introduction/Welc ome/ Overview of Syllabus	Levy / Meschke / Miller	Video: https://crosscut.com/video/ deeply-rooted/tale-two- waters	-Video introduction -Reading for 10/4 -Watch pre- recorded lecture
Tues	10/4	Lecture: Water Regulation & Water Rights	Meschke	In-class report-back on where your water comes from (from video introduction) and discuss water as a global right	-Readings for 10/6 -Watch pre- recorded lectures -Disc. topic 1 response
Thurs	10/6	Lecture: Microbial contaminants	Meschke	<u>Discussion topic 1:</u> Microbial contaminants	- Quiz 1 by 10/13 (online, covers 10/1 + 10/6) -Readings for 10/11 -Watch pre- recorded lectures -Disc. topic 2 response
Tues	10/11	Lecture: Water Chemistry + chemical contaminants	Meschke	<u>Discussion topic 2:</u> Emerging contaminants	-Readings for 10/13 -Watch pre- recorded lectures - <i>In the News 1</i> response
Thurs	10/13	Lecture: Water sources + access, groundwater	Meschke	<u>Discussion Topic 3:</u> <i>In the News 1</i>	- Quiz 2 by 10/20 (online, covers 10/11 + 10/13) -Readings for 10/18 -Watch pre- recorded lectures
Tues	10/18	Lecture: Water treatment processes	Meschke	In-class discussion: how water sources dictate treatment	-Readings for 10/20 -Watch pre- recorded lectures -Research infrastructure policy bill
Thurs	10/20	Lecture: Distribution systems + cross connections	Meschke	In-class discussion on infrastructure/age/vulnerabi lity and the infrastructure policy bill	- Quiz 3 by 10/27 (online, covers 10/18 + 10/20) -Readings for 10/25 -Watch pre- recorded lecture

Tues	10/25	Guest Lecture: Hot tubs and pools	Easterberg	Field trip	-Readings for 10/27 -Watch pre-recorded lecture -Attend Water & Health conference
Thurs	10/27	Centralized/Decentralized wastewater treatment	Meschke	In-class discussion on comparison of centralized vs. decentralized + discussion in groups about policy assignment	- Quiz 4 by 11/3 (online, covers 10/25 + 10/27) -Readings for 11/1 -Watch pre-recorded lecture -Attend Water & Health conference -Conference report-back
Tues	11/1	Lecture: Industrialized pre-treatment	Meschke	<u>Discussion topic 4: UNC Water & Health conference report-backs</u>	-Readings for 11/3 -Watch pre-recorded lecture -Questions for Drs. Schoen and Mitchell
Thurs	11/3	Guest lecture: QMRA (ZOOM)	Schoen/Mitchell	Midterm review	-Study for Midterm! (covers 10/1 – 11/1) -Readings for 11/8
11/3-11/8		MIDTERM (online)			
Tues	11/8	Lecture: Waterborne disease epidemiology	Levy	Infrastructure policy presentations + voting	-Readings for 11/10 - <i>In the News 2</i> response
Thurs	11/10	Lecture: Global water quality	Levy	<u>Discussion topic 5: In the News 2</u>	- Quiz 5 by 11/17 (online, covers 11/8 + 11/10) -Readings for 11/15
Tues	11/15	Lecture: Global sanitation	Levy	Midterm debrief	-Readings for 11/17 -Questions for Dr. Kramer
Thurs	11/17	Guest lecture: SOIL (ZOOM)	Kramer	Discussion with guest speaker	- Quiz 6 by 11/24 (online, covers 11/15 + 11/17) -Readings for 11/22 -Disc. topic 6 response

Tues	11/22	Lecture: Agricultural water	Levy	Discussion topic 6: What's on your Thanksgiving table?	-Readings for 11/29 -Questions for Dr. Mattioli
Thurs	11/24	THANKSGIVING	n/a	n/a	
Tues	11/29	Guest lecture: Wastewater epidemiology (ZOOM)	Mattioli	Discussion with guest speaker	-Readings for 12/1 -Questions for Paulina Lopez
Thurs	12/1	Guest lecture: Duwamish River (ZOOM)	Lopez	Questions for the speaker	-Quiz 7 by 12/8 (online, covers 11/22 + 11/29 + 12/1) -Readings for 12/6
Tues	12/6	Lecture: Water-Energy Nexus	Levy	Final review + Discussion of global droughts	-Final presentation (ENVH 545)
Thurs	12/8	Student presentations	ENVH545 students		-Study for Final exam! (Covers all material from entire class) -Questions for presenters (ENVH 440)
12/12-12/15		FINAL EXAM (online)			