Course Syllabus

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ENVIRONMENTAL & OCCUPATIONAL HEALTH SCIENCES
UNIVERSITY of WASHINGTON | SCHOOL OF PUBLIC HEALTH
(https://deohs.washington.edu/)

ENV H 447/547: Environmental Change and Infectious Disease

Quarter: Spring 2025
Credits & Grading: 3 credits, graded
Time: Tuesdays & Thursdays, 10:00 to 11:20 AM
Place: HRC 135

Instructors & TA:

Jerry Cangelosi, Professor
Office: 4225 Roosevelt Way NE
Email: gcang@uw.edu (mailto:gcang@uw.edu)
Phone: 206-543-2005
(mailto:tmb@uw.edu) **Office Hours:** By appointment

Pronouns: he/his

Karen Levy, Professor
Office: 261 Hans Rosling
Email: klevyx@uw.edu (https://canvas.uw.edu/mailto:klevyx@uw.edu)
(mailto:tmb@uw.edu) **Office Hours:** By appointment

Pronouns: she/hers

Viviana Albán, Teaching Assistant
Email: valban@uw.edu (https://canvas.uw.edu/mailto:valban@uw.edu)
(mailto:tmb@uw.edu) **Office Hours:** By appointment

Pronouns: she/her

Course Description

A multidisciplinary approach is used to address the impacts of environmental change (including climate change) on infectious disease. Concepts include categories of environmental change; infectious disease emergence/re-emergence; environmental aspects of infectious disease exposure, acquisition, and progression; pathogen growth/survival in the environment; historical and societal perspectives; surveillance; and strategies for control.

Learning objectives: At the end of the course, the student will be able to:

- Define and describe infectious disease emergence and re-emergence.
- Describe how environmental change can change the incidence, prevalence, geographical distribution, and/or severity of infectious diseases.
- Compare the different ways that climate change can impact infectious diseases, and identify the factors that are likely to have the greatest impacts.

- Identify and interpret reliable sources of information on environmental change, climate change, and infectious disease.
- Recognize the interface between human and animal health in the contexts of environmental change and infectious disease.
- Recognize the impact of climate change on agriculture and nutrition, and describe the importance of these factors to infectious diseases in humans.
- Evaluate and discuss strategies for detecting and combating emerging and re-emerging infectious diseases, including surveillance, prevention, case detection, and treatment.
- Recognize and discuss controversial issues related to the interplay between environmental change and infectious disease.

Format: In-class lectures by the instructors and guest lecturers. In a few cases, pre-recorded lectures (20-30 min), followed by in-class discussions, often in breakout groups.

Schedule of topics: Please see **Modules (https://canvas.uw.edu/courses/1800398/modules/3370472)**

Office hours: By appointment.

Website: Links to lecture presentations, reading lists, assignments, and announcements, including due dates, will be posted and updated on the course website. Students are responsible for checking for changes to schedule or assignments.

Readings: No textbooks. Required reading and recommended resources, mostly from the scientific literature, posted on web site. Students expected to read required materials prior to class.

Video introduction: Each student is required to submit a 1-2-minute long introduction video. The video should indicate the students name, what they like to be called, preferred pronouns, what degree program they are in, and what they hope to get out of the class. Students who do not have the capacity to record a video (though most should on their phones) may submit a 1 page-long statement describing the same information. Videos/Statements will be due by the beginning of the third class period. (5 pts).

Class participation: Students are expected to speak up, ask questions, share insights, and participate in break-out groups. Students who are unable to attend class during the scheduled sessions should watch recorded class sessions, and contribute by posting to the discussion board. All posts are due by the end of the week on Friday by midnight. (10 pts).

Quizzes: Four multiple choice and T/F quizzes offered every 2nd Thursday-Friday in the first 8 weeks of the course. Open books, open notes, 2 hours to complete. In addition, there will be an optional make-up quiz that students can take during finals week, if they choose. The top 4 quiz scores are used to tabulate the grade.

Panel discussions: Near the end of the Quarter, 447 students in teams of 4 will "debate" controversial issues related to environmental change and infectious disease. 547 students will serve as moderators.

Final research paper: Topic related to the class must be approved by the instructor.

- Paper must be 2-3 pages (not including references), double-spaced, and must include ≥10 primary references. 547 students prepare an additional ≤1-page (single spaced) lay-language "memo" for policy makers.

How do Env H 447 and Env H 547 differ? The graduate course (547) differs from the undergraduate course (447) in the following ways:

- 547 students will present "science behind the story" assignments mid-quarter.
- 547 students will serve as moderators of the Panel Discussions.
- 547 students have an added task in their research paper: A half-page Executive Summary in lay language, designed for policy makers and members of the public.

Grading: Course grades will be based on the following for 447 students:

- Video introduction 5%
- Panel discussion 20%
- Quizzes 45%
- Final research paper 20%
- class participation 10%

Grading: Course grades will be based on the following for 547 students:

- Video introduction 5%
- "Science behind the story" assignment 10%
- Panel discussion 5%
- Quizzes 45%
- Final research paper 25%
- class participation 10%

GRADING: Numerical grades will typically be distributed according to the following scale:

%	GP	%	GP	%	GP
96%	4	86%	3	76%	2
95%	3.9	85%	2.9	75%	1.9
94%	3.8	84%	2.8	74%	1.8
93%	3.7	83%	2.7	73%	1.7
92%	3.6	82%	2.6	72%	1.6

91%	3.5	81%	2.5	71%	1.5
90%	3.4	80%	2.4	70%	1.4
89%	3.3	79%	2.3	69%	1.3
88%	3.2	78%	2.2	68%	1.2
87%	3.1	77%	2.1	67%	1.1
				66%	1

Land Acknowledgment: Washington State is **home (https://www.washingtontribes.org/tribes-map)** to 29 federally recognized and five unrecognized tribes. ***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 Suquamish, Tulalip and Muckleshoot nations.***

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 (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the **SPH Academic Integrity Policy (https://sph.washington.edu/students/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.

Policy on Use of AI:

In this class, you are permitted to use AI tools to assist you in gathering information, writing drafts, and revising your writing. If you choose to use generative AI tools for an assignment in this class, you are required to do the following:

1) Provide a written statement at the end of any assignment in which AI was used that includes the following:

a. A description of how you used generative AI in the assignment or project.

b. A description of how you verified outputs were correct or true.

c. An attestation 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), research or study data, interview transcripts, or personal information of others.
These activities are meant to a) encourage your development of appropriate attribution skills and b) reflect upon how generative AI is contributing to or harming your learning.

Statement on Inclusion and Diversity:

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

1. *To respect individual differences, which may include, but are not limited to, age, cultural background, disability, ethnicity, family status, gender identity and expression, citizenship and 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.*

I am committed to making this class an equitable learning environment. Please talk with me right away if you experience disrespect in this class from other students and/or from me, and I 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. We engage our differences with the intent to build community, not to put down the other and distance our self 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 persons are always doing the best that they can, including the persons 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 her/his 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.

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 are 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 (mailto:uwdrs@uw.edu)** or **disability.uw.edu. (http://depts.washington.edu/uwdrs/)** 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.

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/)** *."*

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.*

Disclaimer: Insofar as possible, the course will adhere to the plan above and the speakers and topics listed in the class schedule. If there are any changes, the TA or instructors will communicate them to the students as soon as possible.

Attendance Expectations

Per UW policy, this class will be conducted in person. You should only register for this class if you can attend in person, or if you meet the criteria for an accommodation from Disability Resources for Students (DRS) or a special arrangement approved by the SPH Office of the Dean that allows you to take the course remotely, or if you receive our approval in advance to attend remotely for other reasons.

Please **contact UW Disability Resources for Students (DRS) (https://depts.washington.edu/uwdrs/)** directly if you feel you may be eligible for an accommodation based on your status as an immunocompromised individual or based on other diagnosed physical or mental health conditions that might prevent you from being able to take classes in-person.

If you are a student enrolled in a program in SPH, and you are either living with an individual who is immunocompromised, OR you are unable to obtain a visa to travel to the US, you may be eligible for a "special arrangement" that will allow you to take this course remotely. To further clarify, immunocompromised refers to individuals with no/critically weakened immune response to the vaccines. Immune compromised is not the same as underlying health concerns which may lead to a more severe response to COVID. Requests for special arrangements to take the class remotely should have been submitted to and approved by the Students and Academic Services team in the Office of the Dean before the beginning of the quarter.

We strongly recommend wearing masks indoors during the first two weeks of spring quarter. Please monitor yourself daily for symptoms and stay home if you are sick. It's also strongly recommended to get tested after travel. Refer to the **UW Face Covering Policy (https://www.ehs.washington.edu/covid-19-prevention-and-response/face-covering-requirements?_ga=2.102791810.305611696.1646677337-2095419026.1632253748)** for the latest guidance and follow the campus-wide face-covering policy at all

times. You are expected to follow state, local, and UW COVID-19 policies and recommendations. 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/or **campus policy (https://www.washington.edu/coronavirus/2022/03/08/spring-quarter-classes-and-uw-mask-policies-message-to-uw-students/?utm_source=uwhp&utm_medium=tiles&utm_campaign=spring-quarter)**, 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 (mailto:covidehc@uw.edu) or calling 206-616-3344**.

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.

Please check your email 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 with a Zoom link for remote instruction or a plan for making up the class.

Collapse All | View Progress | Publish All | + Module

Instructors: START HERE

- About Your Course
- Getting Started with Your Canvas Course
- Improving Accessibility
- Canvas Help and Resources
- Technology Support and Resources (SHARE WITH STUDENTS)

MODULE 1: Definitions and history: Emerging infectious diseases, environmental change

Session 1: April 1 (Course Information and Core Concepts)

- Env H 447-547 SQ2025 Session 1 presentation file - Logistics, emerging infectious diseases.pdf
- IPCC 6th Assessment Synthesis Report.pdf

IPCC Sixth Assessment Synthesis Report (link) (https://www.ipcc.ch/assessment-report/ar6/)

IPCC 6th Assessment Working Group 2 - Impacts, Adaptation, Vulnerabilities.pdf

IPCC Working Group 2: Impacts, Adaptation, and Vulnerabilities (link) (https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/)

Special lecture: Microorganisms - A primer

Microorganisms - a primer.ppt - presentation file

Session 2: April 3 (Factors Affecting Disease Emergence)

Session 2 - factors affecting disease emergence - presentation

03:30:23 ENVH 447:547 How do Infectious diseases emerge.mp4

Session 2 reading: Woolhouse and Gaunt 2007.pdf

Session 3: April 8 (Nick Bond: Fundamentals of Climate Change)

EH_447_Bond_Lecture_2024.pptx.pdf

04_07_23 Nick Bond climatologist for WA guest lecture to post.mp4

Session 4: April 10 (History and Prehistory)

- Env H 447-547 2024 Session 4 (history Part 1).pdf
- Env H 447-547 2024 Session 4 (history Part 2).pdf
- 04:04:23 ENV H class lecture: History and Pre History.mp4
- Assigned reading: McMichael 2011 past millenia.pdf

Session 5: April 15 (Exacerbation of Existing Problems - TB and Diseases of Poverty)

- Env H 447-547 2024 Session 5 - TB and diseases of poverty.pdf
- TB ENV H 447:547 Tues lecture 04:11:23.mp4
- WHO Global Tuberculosis Report 2022
- Assigned reading: Naranbat et al seasonal TB in Mongolia.pdf

Session 6: April 17 (Nutrition/Food Security/Immunity, and COVID-19 Discussion)

- Immunology ENVH 447:547 04:13:23.mp4
- Presentation slides - SQ 2024 - Food security, nutrition, and immune function.pdf

2021 recording - Nutrition, immunity, and food security

Assigned video and discussion topic - nutrition and food security

MODULE 2: Infectious disease impacts of changing environments

Session 7: April 22 (Vector-Borne Disease)

Presentation file - SQ 24 vector-borne disease.pdf

Assigned reading: Siraj et al - malaria altitude temperature.pdf

Optional Reading: Quantifying effects of temperature on mosquito and parasite traits that determine the transmission potential of human malaria.pdf

Session 8: April 24 (Vector-Borne Diseases Part 2 and Science Behind the Story Part 1)

2021 recording - vector-borne diseases (continued)

Quiz 2
Apr 19, 2024 | 10 pts

Session 9: April 29 (Food and Waterborne Diseases)

ENV H 447:547 food and water-borne disease 04_25_23mp4.mp4

Lecture slides - SQ 24 waterborne disease.pdf

Assigned: V. parahaemolyticus outbreak in Alaska nejmoa051594.pdf

Sessions 10: May 1 (Science Behind the Story Part 2)

Session 11: May 6 (Antimicrobials in the Environment, Part 1)

Lecture slides - antimicrobials in the environment - 2024.pdf

ENVH447:547_Antimicrobials in the Environment_05:02:23.mp4

Assigned reading: Johnsen et al Lancet Factors affecting the reversal of drug resistance.pdf

2021 recording - Antimicrobials in the environment - definitions, mechanisms, and evolution

Session 12: May 8 (Antimicrobials in the Environment Part 2 and Science Behind the Story Part 2)

05:04:23_Antimicrobials in the Environment, Part 2.mp4

Discussion topic on antimicrobials in the environment

Quiz 3
May 3, 2024 | 10 pts

Session 13: May 13 (Air/Dust Borne Diseases)

- Lecture slides - air and dustborne disease.pdf
- Env H 447-547 Panel Discussion Assignment 2023.docx
- Panopto recording (2021): Air- and dust-borne disease

MODULE 3: Related impacts of environmental change

Session 14: May 15 (Environmental Change and the Human Microbiome)

- Panel discussion example - Zika and yellow fever vaccination.pdf
- Science Behind the Story_Example 1 (good presentation of a bad article).pdf
- Science Behind the Story_Example 2 (good presentation of a goodarticle).pdf

Session 15: May 20 (Microbiomes (cont) and Panel Discussion Prep)

Lecture slides - microbiomes part 1.pdf

Discussion for Tuesday May 14: The "Hygiene Hypothesis"

Assigned video - Rob Knight TED Talk on the human microbiome

Assigned video: Jessica Greene - Microbiomes of built environments

2021 recording - Human Microbiomes 101

Session 16: May 22 (Harmful Algae Blooms and Panel Discussions)

Lecture slides - microbiomes pt 2 and HABS.pdf

Microbiome#2_Harmful_Algal_Blooms_05_18_23.mp4

Assigned reading: cyanoHAB and ALS.pdf

Sessions 17-19: May 27 - June 3 (Panel Discussions)

Quiz 4
May 17, 2024 | 10 pts

ENVH 447:547_Microbiome_05_16_23.mp4

Panel DiscussionsGMO_Antibiotics_05_23_23.mp4

Panel Discussion Facilitator 547 students only

5 pts

Panel Discussion Assignment 447 students only
20 pts

Env H 447-547 Panel Discussion Assignment 2023.docx

Final Research Paper 447 students only
Jun 8 | 20 pts

Final Research Paper 547 students only
Jun 8 | 25 pts

Session 20 : June 5 (Summary Topics)