

Course Syllabus

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ENV H 305 A: Environmental Poisons and Public Health

Quarter: Winter 2024

Credits & Grading: 3 credits, graded

Time: Monday's and Wednesday's from 1:00-2:20 PM

Location: HSEB 235

Professor: Dr. Yijie Geng (he/him)

Office hours: By appointment

Office: 4225 Roosevelt Way NE, Suite 100, Rm. 210

Telephone: 206-543-8087

Email: yjgeng@uw.edu (<mailto:yjgeng@u.edu>)

TA: Alex He (he/him)

Office hours: By appointment

Email: baixih@uw.edu (<mailto:baixih@uw.edu>)

Course Description

The goal of this course is to introduce undergraduate students in all majors to the various ways in which chemical hazards impact both the environment in which they are found and the humans who interact with them. Topics covered include the history of hazardous substances in the environment, how these substances move through various ecological systems, how humans are exposed to them, what adverse human health effects they may cause, what are the key factors influencing toxicity and susceptibility, and what regulatory frameworks are in place to help minimize risk. The course is designed to facilitate

student-centered, active and investigative learning. In addition to formal lectures, case-based instructional strategies are used to introduce and explore the core concepts of toxicology and related environmental health disciplines and apply these concepts to real-world situations with relevance to students' lives. Through the lens of case-based modules, students learn to critically evaluate media reports about environmental hazards to human health by applying core principles from toxicology and other related environmental public health disciplines.

Course Credit:

The course is a 3-credit course and class time will be used in a balance of didactic lectures as well as participatory exercises, presentation, and discussion.

Course Objectives:

Upon completion of this course students will demonstrate the ability to:

1. Explain where certain exemplary environmental toxicants come from, how they got there, and how they move through the environment.
2. Describe the various ways in which humans are exposed to these toxicants and how they can enter the human body.
3. Identify the key factors that determine how toxic these substances are to humans.
4. Describe the adverse human health effects that can be caused by exposure to these toxicants and how experimental and epidemiological studies have been used to identify these effects.
5. Describe the basic elements of risk assessment and give examples of their application to specific environmental toxicants.
6. Critically evaluate informal and formal reports about environmental hazards to human health by applying core principles from toxicology and other related environmental public health disciplines.
7. Identify factors that affect the susceptibility and vulnerability of individuals as well as human populations to toxicants.

Textbooks & Reading Materials:

No Required Textbooks.

Core Recommended Readings:

- Gilbert, S. (2020). *A small dose of toxicology: The health effects of common chemicals*. <https://www.asmalldoseoftoxicology.org/download-in-english> 

<https://www.asmalldoseoftoxicology.org/download-in-english> (Free download. Links to an external site.)

- Klaassen, Curtis D, & Watkins, John B. (2015). *Casarett & Doull's essentials of toxicology*(3rd). New York, N.Y.: McGraw-Hill Companies.

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Optional Readings:

- Richards, I., & Bourgeois, Marie. (2013). *Principles and practice of toxicology in public health*(2nd ed.). Sudbury, Mass.: Jones & Bartlett Learning.
- Frumkin, H., Editor (2016). *Environmental health: from global to local*(3rd ed). San Francisco, CA: Jossey-Bass, A Wiley Brand.

Zoom/Slide Posting:

All slides will be posted, and we will use Zoom to record videos of all classes.

Grading and Assignments

Grade Breakdown:

Grade %	Assignment
	Graded Assignments:
25%	First Group Presentation
25%	Second Group Presentation
10%	First Individual Reflection Paper
10%	Second Individual Reflection Paper
	Credit/No Credit Assignments:
20%	In-class assignments
5%	First Group Presentation Follow-up Question
5%	Second Group Presentation Follow-up Question

Group Presentations (25% x 2), Follow-Up Questions (5% x 2), and Individual Reflection Papers (10% x 2): This course is organized around four case study modules. Students are required to **actively participate in every module in one of two ways**:

- by working in a small group to prepare an in-class presentation on a specific aspect of the topic (2 of 4 modules, 25% each);
- by preparing and submitting follow-up questions for the presenters and writing a reflection paper (2 of 4 modules, 5% + 10% each). In addition, each student will submit an individual reflective post by 11:59pm Sunday of that week describing aspects of one presentation they liked, and the toxicological concepts they learned from it (2 of 4 modules, 10% each).

Group Presentations: Groups of 4-5 students will research an Area of Further Inquiry (AFI) related to the topic of the module and prepare a **15-minute** PowerPoint presentation. A presentation must include discussion of data from at least one peer-reviewed scientific article. Presentation slides must be submitted online 24 hours before the in-class presentation (by 1 pm the day BEFORE the presentation). Grades for each small group presentation will be based on a combination of instructor/TA evaluation (60%) and peer evaluation by group members for individual contribution (40%). Peer evaluations must be submitted by each group member within 24 hours of the presentation (by 1 pm the day AFTER the presentation). Everyone in the group will receive the same grade unless peer evaluation feedback indicates that an individual group member deserves a lower/higher grade based on their contribution to the project.

- Full points earned: 15 (by instructor/TA) + 10 (by group peer review) = 15 points
- Late submissions will be deducted 1 point unless approved by the instructor/TA for valid reasons (illnesses, family emergency, etc).
- Extra credits: earn up to 3 extra bonus credits per presentation if presenting more than the minimum required amount of data from peer-reviewed scientific publications. Minimum requirement: presenting and discussing at least one data/result from one peer-reviewed scientific article. Examples of extra credit: discussing multiple data from one paper or discussing data from several papers.

Follow-up questions: Groups of 4-5 students will be assigned the task of reviewing a presentation on the course website and submitting follow-up questions to the presenters at the beginning of the class. This is not a group task, so each student is expected to submit at least one question individually. A copy should be submitted to the instructor/TA for record keeping and grading.

Reflection Papers: Students will write a short reflection paper describing aspects of one presentation they liked, the toxicological concepts they learned from it, and/or how it might be relevant to their lives, future career goals, etc.

- Format: electronic, no longer than 1 page, double spaced.
- Due: within 1 week of the conclusion of the module. Late turn-ins will be deducted 1 point each day unless approved by the instructor/TA.
- Extra credits: earn up to 1 extra bonus credit per paper if you have learned additional information beyond what was discussed in the presentation and follow-up questions, especially those from peer-reviewed scientific journals.

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In-Class Assignments (20%): Over the course of the ten-week quarter (18 lectures/presentations), students' participations and understanding of course materials will be assessed periodically through in-class activities:

- *Presentation Topic Brainstorm Sessions* (3 pts. each, 4 times = 12 total pts. Group activity.)
- *Question of the Day* (2 pts. each, 4 times = 8 total pts. Individual responses.)
- All submissions (in paper) will be collected in class.
- Not graded, earn credit for participation.

Course Outline & Schedule

Time: Monday and Wednesday from 1:00 – 2:20 PM

Location: HSEB 235

Note: Each case study module includes lectures and activities related to some of the following core concepts of EHS/Toxicology as they pertain to that particular substance/toxicant:

- Fate & Transport
- Dose response
- Absorption
- Effects of distribution, metabolism, and excretion on toxicity
- Effects of routes, frequency, and duration of exposure on toxicity
- Individual susceptibility
- Toxicity testing
- Occupational and environmental epidemiology

- Risk assessment, policy and regulatory framework

Session Topic Covered or Activity

MODULE 0: *Introduction to Foundational Concepts of Toxicology*

1 (1/6) Course introduction and overview. Fundamentals of toxicology.

2 (1/8) Fundamentals of toxicology.

MODULE 1: *Case Study-- Aflatoxins*

3 (1/13) Overview of Case Study #1 (*Aflatoxins*), Interactive Lecture: Foundations of *Aflatoxins*

Groups brainstorm to identify Areas for Further Inquiry (AFI)

4 (1/15) Groups submit AFI and report to the class

Class picks AFIs and decides group assignments

In-class group work

5 (1/22) Group presentations – session 1 (3 presentations)

6 (1/27) Group presentations – session 2 (3 presentations)

MODULE 2: *Case Study-- BPA*

7 (1/29) Overview of Case Study #2 (BPA), Interactive Lecture: Foundations of BPA

Groups brainstorm to identify Areas for Further Inquiry (AFI)

8 (2/3) Groups submit AFI and report to the class

Class picks AFIs and decides group assignments

In-class group work

9 (2/5) Group presentations – session 1 (3 presentations)

10 (2/10) Group presentations – session 2 (3 presentations)

MODULE 3: Case Study-- Cadmium

11 (2/12) Overview of Case Study #3 (Cadmium), Interactive Lecture: Foundations of Cadmium

Groups brainstorm to identify Areas for Further Inquiry (AFI)

12 (2/19) Groups submit AFI and report to the class

Class picks AFIs and decides group assignments

In-class group work

13 (2/24) Group presentations – session 1 (3 presentations)

14 (2/26) Group presentations – session 2 (3 presentations)

MODULE 4: Case Study-- Marijuana and pesticides

15 (3/3) Overview of Case Study #4 (Marijuana and pesticides), Interactive Lecture: Foundations of Marijuana and pesticides – from adverse health effects to medicine

Groups brainstorm to identify Areas for Further Inquiry (AFI)

16 (3/5) Groups submit AFI and report to the class

Class picks AFIs and decides group assignments

In-class group work

17 (3/10) Group presentations – session 1 (3 presentations)

18 (3/12) Group presentations – session 2 (3 presentations)

Class Policy & Resources

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](https://apps.leg.wa.gov/WAC/default.aspx?cite=478-121) [↗](https://apps.leg.wa.gov/WAC/default.aspx?cite=478-121) (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](https://www.washington.edu/cssc/) [↗](https://www.washington.edu/cssc/).









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/) (<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>) [↗](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/) (<https://registrar.washington.edu/staffandfaculty/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/) (<https://registrar.washington.edu/students/religious-accommodations-request/>) [↗](https://registrar.washington.edu/students/religious-accommodations-request/) (<https://registrar.washington.edu/students/religious-accommodations-request/>) [↗](https://registrar.washington.edu/students/religious-accommodations-request/) (<https://registrar.washington.edu/students/religious-accommodations-request/>).

Access & 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 accommodation 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](https://portal.deohs.washington.edu/index.php/disability.uw.edu) [↗](https://portal.deohs.washington.edu/index.php/disability.uw.edu) (<https://portal.deohs.washington.edu/index.php/disability.uw.edu>).

Course Summary:

Date	Details	Due
Mon Jan 6, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087859&include_contexts=course_1786402	1pm to 2:30pm
Wed Jan 8, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087860&include_contexts=course_1786402	1pm to 2:30pm
Mon Jan 13, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087861&include_contexts=course_1786402	1pm to 2:30pm
Wed Jan 15, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087862&include_contexts=course_1786402	1pm to 2:30pm
Wed Jan 22, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087864&include_contexts=course_1786402	1pm to 2:30pm
Mon Jan 27, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087865&include_contexts=course_1786402	1pm to 2:30pm
Wed Jan 29, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087866&include_contexts=course_1786402	1pm to 2:30pm
Mon Feb 3, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health	1pm to 2:30pm

Date	Details	Due
	https://canvas.uw.edu/calendar?event_id=4087867&include_contexts=course_1786402	
Wed Feb 5, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087868&include_contexts=course_1786402	1pm to 2:30pm
Mon Feb 10, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087869&include_contexts=course_1786402	1pm to 2:30pm
Wed Feb 12, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087870&include_contexts=course_1786402	1pm to 2:30pm
Wed Feb 19, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087872&include_contexts=course_1786402	1pm to 2:30pm
Mon Feb 24, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087873&include_contexts=course_1786402	1pm to 2:30pm
Wed Feb 26, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087874&include_contexts=course_1786402	1pm to 2:30pm
Mon Mar 3, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087875&include_contexts=course_1786402	1pm to 2:30pm

Date	Details	Due
Wed Mar 5, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087876&include_contexts=course_1786402	1pm to 2:30pm
Mon Mar 10, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087877&include_contexts=course_1786402	1pm to 2:30pm
Wed Mar 12, 2025	 ENV H 305 A Wi 25: Environmental Poisons And Public Health https://canvas.uw.edu/calendar?event_id=4087878&include_contexts=course_1786402	1pm to 2:30pm
	 First Group Presentation Follow-up Question https://canvas.uw.edu/courses/1786402/assignments/10056535	
	 Group Peer Evaluation Feedback https://canvas.uw.edu/courses/1786402/assignments/10056508	
	 M1 Group Presentation https://canvas.uw.edu/courses/1786402/assignments/10056474	
	 Presentation Topic Brainstorm Sessions #1 https://canvas.uw.edu/courses/1786402/assignments/10056582	
	 Question of the Day - 1/6/2025 https://canvas.uw.edu/courses/1786402/assignments/10025865	
	 Question of the Day - 1/8/2025 https://canvas.uw.edu/courses/1786402/assignments/10041951	