

ENV H 516 A: TOXIC AGENTS: EFFECTS AND MECHANISMS SYLLABUS

Quarter: Spring 2024
Credits & Grading: 4 credits, graded
Time: Monday & Wednesday, 8:30 – 9:50 AM; Friday 8:30 – 9:20 AM
Location: [Health Sciences Education Building](#) (HSEB), Room 426

INSTRUCTOR

Instructor: Toby B. Cole (*he/him/his*), Clinical Assistant Professor, DEOHS
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Office hours: By appointment; Institute on Human Development & Disability, Room #CD288.

COURSE DESCRIPTION

ENV H 516 A is the second course of a two-course sequence (ENV H 515/516). The overall goal of the series is for students to expand the basic concepts and mechanisms of toxicology gained in ENV H 503 to understand how chemicals interact with biological systems to produce adverse effects, i.e., the science of toxicology. Thus, prerequisites for this series generally include having taken ENV H 503 and ENV H 515. While ENV H 515 focused on organ toxicology and organ systems, the content of ENV H 516 focuses on the most important **classes of toxic chemicals** (as well as physical and biological agents), their toxic effects in humans and animals, and the underlying mechanisms. There will be experts in some of the proposed topics providing guest lectures throughout the course. Lectures will cover the toxicology of natural toxins, metals, phthalates, BPA, PCBs, dioxins and other halogenated contaminants, PBDEs, PFAS, solvents, radiation, pesticides, air pollutants, and nanomaterials, as well as food toxicology, ecotoxicology, and clinical / occupational toxicology.

COURSE LEARNING OUTCOMES

After completing this course, students will have acquired a fundamental understanding of the toxic effects of different agents. They will be able to identify major issues related to the toxicity of environmental agents, recognize toxic effects induced by these agents, explain mechanisms of toxicity, identify routes and nature of exposures, evaluate types of toxic effects, have a basic understanding of the main aspects of ecotoxicology, occupational toxicology and clinical toxicology, and their roles within toxicology, public health and environmental and occupational health sciences.

REQUIRED TEXTBOOKS & READINGS

Casarett & Doull's Toxicology, The Basic Science of Poisons, 9th Edition, Curtis D. Klaassen & John B Watkins III, McGraw Hill, 2021. Chapters in this textbook cover most topics taught in the class.

(This textbook is available as an eBook through the UW Libraries, or through this [website](#))

Recommended, optional, or supplementary readings

Additional reading material, handouts with slides, etc. will be available as Canvas Pages or Adobe Acrobat files that can be viewed on Canvas or downloaded. In some cases, the readings may be links to websites. Videos will also be available on Canvas Pages.

GRADING

Grades will be determined by weekly take-home quizzes (25%), midterm exam (35%), final exam (35%), and classroom participation (5%). Each of the two exams will cover all material presented in the preceding lectures. The final exam will be held during finals week but will not be a cumulative exam.

Weekly take-home quizzes

Weekly take-home quizzes covering the previous week's material will be posted to Canvas on Mondays and will be due by end of day Friday. These quizzes consist of multiple-choice, true/false, or matching questions. Students are free to use lecture materials, notes, and textbook chapters to answer the questions.

Midterm Exam

The midterm exam (Exam #1) covers the material in the first half of the course, and will be an in-person, closed-book exam consisting of 3-4 essay / short answer questions.

Final Exam

The final exam (Exam #2) is NOT a comprehensive exam. It covers only the material in the second half of the course, and will also be an in-person, closed-book exam consisting of 3-4 essay / short answer questions.

Grading Criteria

A 4.0 scale will be calculated using the following conversion:

4.0 Scale	Percentage	4.0 Scale	Percentage	4.0 Scale	Percentage
4.0	100%	3.1	86%	1.7	72%
4.0	99%	3.0	85%	1.6	71%
3.9	98%	2.9	84%	1.5	70%
3.9	97%	2.8	83%	1.4	69%
3.8	96%	2.7	82%	1.3	68%
3.8	95%	2.6	81%	1.2	67%
3.7	94%	2.5	80%	1.1	66%
3.7	93%	2.4	79%	1.0	65%
3.6	92%	2.3	78%	0.9	64%
3.6	91%	2.2	77%	0.8	63%
3.5	90%	2.1	76%	0.7	62%
3.4	89%	2.0	75%	0.7	61%
3.3	88%	1.9	74%	0.7	60%
3.2	87%	1.8	73%		

Late assignment policy / Excused absence from class

All quizzes must be submitted through Canvas by the due date. The instructor understands that in some instances, certain personal situations may make it impossible to submit a specific material on time. Please reach out to Dr. Cole as early as possible if you have extenuating circumstances.

Students are expected to attend class and to participate in all graded activities. A student who is anticipating being absent from class due to a Religious Accommodation activity needs to complete the Religious Accommodations request process by the second Friday of the quarter. Students who anticipate missing class due to attendance at academic conferences or field trips, or participation in university sponsored activities should provide a written notice to the instructor ahead of the absence. The instructor will determine if the graded activity or exam can be rescheduled or if there is equivalent work that can be done, as determined by the instructor.

To protect student privacy and the integrity of the academic experience, students will not be required to provide a medical excuse note to justify an absence from class due to illness. A student absent from any graded class activity or examination due to illness must request, in writing, to take a rescheduled examination or perform work judged by the instructor to be the equivalent.

Student responsibilities

Students are expected to participate in class by asking questions or providing comments to the lecturers, and by involvement in class discussions. Guest lecturers will be an asset to the course and will assist in providing coverage of subject areas within their respective areas of expertise. Over the course, there will be content posted on Canvas before and/or after each session. All sessions will be recorded and uploaded to Canvas for instructional purposes related to this class. Students are not permitted to copy or share the recording with others. If you have privacy concerns about Zoom recordings in this class, please contact the course instructor.

The instructor welcomes any feedback you may have to improve their teaching and this course.

COURSE SESSION SCHEDULE

Below is a tentative lecture schedule. Any changes will be announced in class and/or posted on Canvas.

Date	Topic	Instructor	Reading
3/25 (Mon)	Introduction / Overview	Toby Cole	
3/27 (Wed)	Animal & Plant Toxins I	Toby Cole	Chapter 26
3/29 (Fri)	Animal & Plant Toxins II	Toby Cole	Chapter 26
4/01 (Mon)	Metals/metalloids I	Tom Lewandowski	Chapter 23
4/03 (Wed)	Metals/metalloids II	Tom Lewandowski	Chapter 23
4/05 (Fri)	Metals/metalloids III	Tom Lewandowski	Chapter 23
4/08 (Mon)	Metals/metalloids: IV	Tom Lewandowski	Chapter 23
4/10 (Wed)	Radiation & Radioactive Materials	William Griffith	Chapter 25
4/12 (Fri)	Pesticides	Lucio Costa	Chapter 22
4/15 (Mon)	Pesticides	Lucio Costa	Chapter 22
4/17 (Wed)	Pesticides	Lucio Costa	Chapter 22

Date	Topic	Instructor	Reading
4/19 (Fri)	Polybrominated Diphenyl Ethers (PBDEs)	Julia Cui	Supplemental
4/22 (Mon)	Polychlorinated Biphenyls (PCBs)	Edward Kelly	Supplemental
4/24 (Wed)	Dioxins & Other Halogenated Chemicals	Edward Kelly	Supplemental
4/26 (Fri)	Phthalates & Bisphenol A (BPA)	Sheela Sathyanarayana	Supplemental
4/29 (Mon)	Ecotoxicology	Evan Gallagher	Chapter 30
5/01 (Wed)	Mid-term Exam (covers 3/25 – 4/26)		
5/03 (Fri)	Solvents: Aliphatic solvents	Toby Cole	Chapter 24
5/06 (Mon)	Solvents: Aromatic solvents	Toby Cole	Chapter 24
5/08 (Wed)	Solvents: Alcohols; Safer solvents	Toby Cole	Chapter 24
5/10 (Fri)	Per- and Poly-fluoroalkyl Substances (PFAS)	Tom Lewandowski	Supplemental
5/13 (Mon)	Air Pollution	Cora Sack	Chapter 31
5/15 (Wed)	Air Pollution	Toby Cole	Chapter 31
5/17 (Fri)	Nanoparticle Toxicology	Chris Carosino	Chapter 29
5/20 (Mon)	Nanoparticle Toxicology	Chris Carosino	Chapter 29
5/22 (Wed)	Food Additives	Toby Cole	Chapter 27
5/24 (Fri)	Food Toxicology	J. Scott Meschke	Chapter 27
5/27 (Mon)	Memorial Day	Holiday (No class)	
5/29 (Wed)	Occupational Toxicology	Katia Harb	Chapter 34
5/31 (Fri)	Clinical / Occupational Toxicology	Deborah Cherry	Chapters 33, 34
6/04 (Tue)	Final Exam 8:30 – 10:20 AM (covers 4/29 – 5/31)		

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 the Course Canvas 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 make an announcement via Canvas with a Zoom link for remote instruction, or a plan for making up the class.

Additional recommendations include:

1. **Get boosted with the updated COVID-19 vaccines.** These vaccines are available at clinics and pharmacies, as well as [through UW Medicine](#) and local health agencies.
2. **Get your annual flu shot.**

3. **Wear a high-quality mask in indoor public spaces and while traveling. Masks are strongly recommended the first two weeks of winter quarter.** High-quality masks help protect against a range of respiratory viruses, and are [available for free in locations on each UW campus](#).
4. **Take a coronavirus test if you have symptoms or have been exposed.** Rapid antigen tests are widely available for [free at on-campus locations linked here](#). The [Husky Coronavirus Testing](#) voluntary research study is also available for UW students.
5. **[Activate WA Notify on your phone](#)** to receive exposure notifications and so that you can anonymously let others know of their exposure if you test positive.

IMPORTANT POLICIES & RESOURCES

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/).

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, 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](#).

Communication and Writing Skills

Communication through writing and speaking is an important transferable skill for all career pathways. Establishing a strong foundation in communication skills will help you be successful throughout your future course work and career. Therefore, this course includes assignments with the goal to help you identify areas of strength and improvement in your oral and written communication skills. If you feel that you could benefit from additional opportunities to improve your writing skills in particular, a list of resources at the UW and others accessible online can be found on the SPH website [here](#).

LAND ACKNOWLEDGEMENT

Washington state is home to 29 federally recognized and multiple unrecognized tribes. We include a land acknowledgment statement as a sign of respect for the original caretakers of the land: “We acknowledge 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.”

EQUITY, DIVERSITY & INCLUSION

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, 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.

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.

Learning Environment

The Department of Environmental and Occupational Health Sciences (DEOHS) strives to create welcoming and respectful learning environments that promote access and opportunity for all students, regardless of their experiences, perspectives, identities, and abilities. The DEOHS, along with The UW School of Public Health, seek to ensure all students are fully included in each course. We strive to create an environment that reflects community and mutual caring. Students are encouraged to talk to instructors, advisors, members of the departmental or SPH Diversity Committee and/or program director with concerns about the classroom climate.

If you feel like this class is not living up to that commitment, there are several ways you can register your concern and seek resolution:

- If you feel comfortable doing so, begin by discussing your concern with the instructor and/or teaching assistant. Your instructor is expected to take your concerns seriously and work with you to identify a resolution.
- If you are not comfortable discussing the concern with the instructor, or you did so and the issue has still not been resolved, contact Trina Sterry, DEOHS Manager of Student and Academic Services (tsterry@uw.edu) to discuss your concern. She can also connect you to the appropriate member of DEOHS faculty leadership as needed.
- If you prefer to discuss your concern directly with someone from the School of Public Health (SPH) Dean's Office, you can review [the SPH Student Concern Policy](#) and follow the procedures described there, including reaching out to the SPH Assistant Dean for Equity, Diversity and Inclusion, Dr. Victoria Gardner (vg@uw.edu). If you prefer to anonymously report your concern, you can email dcinfo@uw.edu or use [the SPH Bias Incident Report Form](#).
- If your concern is related to a bias incident, you can review [the UW's guidance on reporting bias incidents](#), which includes a link to the UW Bias Reporting Tool.
- If you have experienced sex or gender discrimination, including sexual assault, relationship or intimate partner violence, stalking, sexual harassment, or other sexual misconduct, you have the right to make a formal complaint and request an investigation under Title IX. Information about Title IX reporting options is available at <https://www.washington.edu/titleix/report/>. The University also has other designated offices to help you avoid and/or report sexual harassment: SafeCampus (<https://www.washington.edu/safecampus/>); Office of the Ombud (<https://www.washington.edu/ombud/>); and University Complaint Investigation and Resolution Office (<https://www.washington.edu/uciro/>).

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](#).