CHEM 480.001: CHEMICAL TOXICOLOGY

Fall 2025

Instructor
Dr. Ryan Casey
SC 5301E
T: 410-704-3051
E: racasey@towson.edu

Office Hours: 4:00 – 5:00 MW,
Additional times available upon request.

Meeting Times Lecture: MWF 11:00 – 11:50 AM, SC 2232

Final Exam: 10:15 AM – 12:15 PM, Monday, Dec. 15, 2025

Course Description
Study of the fate, effects, and mechanisms of action of toxicants; physical and biological factors affecting transport, transformation and toxicity of chemical stressors; emphasis on forensic and environmental applications.

Prerequisites CHEM 351, BIOL 200/200L, or consent of instructor

Text Roberts et al. 2022. Principles of Toxicology, Environmental and Industrial Applications, 4th ed. Wiley. ISBN 978-1-119-63517-8
This textbook is optional and other editions are fine.
Additional supplementary resources will be provided in class.

Syllabus Subject to Change
The policies, number and type of assignments and grading practices in this syllabus are subject to change. Any changes will be communicated to students in writing, including posting a revised syllabus on Blackboard.

Grading
Students will be evaluated based on the following assignments.

5 In-class breakout sessions (out of 6, drop lowest; 20 points each)	100 points
3 Exams (150 points each)	450 points
4 Journal Article Discussions (50 points each)	200 points
1 Final Exam	200 points
Total	950 points

Final grades will be based on the following scale: 92-100% = A, 90-91% = A-, 88-89% = B+, 82-87% = B, 80-81% = B-, 78-79% = C+, 70-77% = C, 68-69% = D+; 60-67% = D; < 60% = F. This will be based on points earned out of 950 possible.

Course Communications

All course documents will be available on Blackboard. Students are expected to check their TU email regularly to stay up to date with course communications.

Statement on the Acceptable Use of Artificial Intelligence (AI)

Details on the acceptable use of AI, including large language models like ChatGPT, Microsoft Co-Pilot and Google Gemini will be provided for all assignments and may vary among assignments. Some may require the use of AI, and some may limit the use of AI.

In-class Group Work

The class will divide into groups of approximately three students and each group will be given several questions to work on collaboratively for ~10 minutes. Questions will pertain to recent lecture material and will approximate exam questions. At the end of the session, each group will turn in their assignment then present their results to the class. Credit will be awarded based on accuracy and meaningful participation. The participation grade will be determined by your peers in the group, subject to review by the instructor. There are six scheduled group work sessions. The group work grade will be determined from the five highest session scores. Group work sessions cannot be made up. A missed session will count as the session grade that will be dropped. If more than one session is missed, those sessions will be assigned a grade of zero and will be included in the calculation of the final grade. Unless stated otherwise, the use of AI on these assignments is not permitted.

Journal Article Discussions

We will select several journal articles for discussion in class. You will prepare a summary and critique of the articles in advance and then we will have a group discussion about the science, structure and ramifications of the papers. Credit will be given for the critique and for participation in the class discussion. Some discussions will be conducted synchronously during scheduled class time and others will be conducted asynchronously using a discussion forum on Blackboard. Details will be provided with each assignment. Missed synchronous discussion sessions cannot be made up. Literature assignments turned in late will be penalized 5 points per day starting the day of the missed assignment. Critiques will be accepted late until the assignment is returned to the class, after which no late assignments will be accepted. Points for missed discussions cannot be made up. In the event that a discussion is missed for an authorized University activity and has been approved prior to the date by the instructor, participation points for discussions may be waived. Unless stated otherwise, AI is acceptable for answering instructor questions and proofreading these assignments, but is not acceptable for generating summaries or discussion points about the articles.

Exams

Missed exams cannot be made up. If an exam is missed for an absence that is excused based on University criteria, the % grade from the final will replace the missed exam grade. Unexcused exams will count as a zero toward the final course grade.

Academic Integrity

You will be required to sign an honor statement for all exams stating that you have neither given nor received unauthorized aid on the exam. Violation of the honor statement will result in a zero on the exam. Copying any assignment will result in a zero for the assignment, for all parties involved. A second instance of academic dishonesty will result in an “F” for the course.

Students are responsible members of the academic community. You are therefore obligated not to violate the basic standards of integrity. You are also expected to take an active role in encouraging other members of the community to respect those standards. Should you have reason to believe that a violation of academic integrity has occurred, you are encouraged to make the suspicion known to a member of the faculty or University administration. Cheating means using, attempting to use, and/or

disseminating unauthorized materials, information, notes, study aids, videos or other devices in any academic exercise. This includes unauthorized communication of information during an exercise or exam. Some examples include but are not limited to: Copying from another student's paper or receiving unauthorized assistance during any graded deliverable; using books, notes or other devices (e.g., calculators, phones, watches, laptops, or other internet enabled devices) when these are not authorized; procuring without authorization tests or examinations before the scheduled exercise (including discussion of the substance of examinations and tests when it is expected these will not be discussed); copying reports, laboratory work, computer programs or files and the like from other students; collaborating on laboratory or computer programs or files and the like with other students; collaborating on laboratory or computer work without authorization and without indication of the nature and extent of the collaboration; sending a substitute to take an examination, using solutions manuals, providing exam and assignment questions to student websites or using such a website to complete an assignment and/or exam (including free or pay websites that maintain textbook and/or instructor solutions). To clarify, copying or collaborating with other students or using external resources, including other people, on any type of assignments that are expressly designed to be completed individually is cheating.

Recorded sessions and any associated materials are designated ONLY for registered students in the class. Any sharing or dissemination of recordings beyond the student body registered in the course and section constitutes a violation of privacy and may also be categorized as cheating or defamation of character (depending on the circumstance), a possible copyright infringement.

Complicity in Academic Dishonesty means helping or attempting to help another commit an act of academic dishonesty. Some examples include but are not limited to: Allowing another to copy from one's paper during an examination or test; distributing test questions or substantive information about the material to be tested without authorization before the scheduled exercise; collaborating on academic work that is expressly designed to be completed individually; taking an examination or test for another student; signing a false name on an academic exercise; or sharing assignment or exam information before, during, or after the deliverable in written, electronic, video, or verbal form. (Note: Collaboration and sharing information are characteristics of academic communities. These become violations when they involve dishonesty. Students should seek clarification when in doubt).

The full description of University academic integrity policies dishonesty can be found here. Please contact me if you have any questions regarding acceptable academic conduct in this course.

Disruptions to the Class Schedule

In the event of University closure or disruption of the class meeting schedule due to COVID, snowstorm, hurricane, etc., alternate instructions will be posted on Blackboard. Make sure to check as soon as you are able to connect to the internet.

Course Repeat Policy

Students may not repeat a course more than once without prior permission of the Academic Standards Committee.

Accommodations

This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Accessibility and Disability Services (ADS), 7720 York Road, Suite 232, 410-704-2638 (Voice) or 410-704-4423 (TDD). Students who expect that they have a disability but do not have documentation are encouraged to contact ADS for advice on how to obtain appropriate evaluation. A memo from ADS authorizing your accommodation is needed before any accommodation can be made.

Chemistry Department Statement on Classroom Diversity and Inclusion

The students, faculty, and staff at Towson University represent a diverse and vibrant community of learners and scholars. As a community, we value the unique contributions of each individual and promote active participation in all aspects of the learning process by each community member. Your instructor supports Towson University's goal of fostering a diverse and inclusive educational setting. Your instructor strives to create a classroom environment built upon the principles of mutual respect and support. Toward this end, all members participating in this course are expected to demonstrate respect for all other members of the class. If you feel these expectations have not been met, please speak with your instructor or the designated diversity liaison, Dr. Cindy Zeller (czeller@towson.edu). For further information regarding the diversity and inclusion policies of Towson University, please see the Towson University Commitment to Diversity, the Fisher College of Science and Mathematics Diversity Action Website, and the Chemistry Department Diversity Action Plan.

Copyright Notice

Lecture Outline (subject to modification)
Material covered on each exam is approximate. Specific coverage of topics for each exam will be announced in class.

Topic	Text Chapters	
General Principles of Toxicology	1	
Absorption, Distribution	2	
Metabolism and Excretion	2, 12.1-12.4	Exam 1
Toxicokinetics	3	
Human Health and Ecological Risk Assessment	23, 24	
Hepatotoxicity	8	
Nephrotoxicity	9	Exam 2
Neurotoxicity	10	
Reproductive and Developmental Toxicity	14	
Mutagenesis and Carcinogenesis	15, 16	Exam 3

Note: Content from Chapters 17, 18, 19 and 20 will be distributed throughout the course. I will refer students to specific examples in these chapters as part of our coverage of material in earlier chapters.