CHEM3800A for Fall 2026

THE CHEMISTRY OF ENVIRONMENTAL POLLUTANTS

We, the people of the Faculty of Science at Carleton University, acknowledge that our campus is located on the traditional, unceded territories of the Algonquin Anishinabeg people. Miigwetch for your hospitality and stewardship of this territory and the teachings that come from it. We are grateful for this land, the air that we breathe, and the water that sustains us all as well as for the animals, plants and other living beings: these enable us to research, teach, mentor, support, study, and learn. We recognize our responsibility to our natural environment and to reconciliation with Indigenous peoples.

Course Instructor: Amy Rand

How to address me: Dr. Rand

Gender Pronouns: she/her/hers (learn more)

Email: Amy.Rand@Carleton.ca

Note: If you have or question or would like to talk with me, you can send an email, visit me during student hours (see below), or approach me after lecture.

Best Ways to be in Touch: in class, via email, or during student hours. I will respond to emailed questions during office hours or within one business day.

Student Hours: Thurs & Fri, 1-2 pm, 320 Steacie Building

Office Location: Room 320, Steacie Building

Class Location: Room 238, Tory Building

Class Times: Wed & Fri, 8:35-9:55 am

Prerequisites: CHEM2207 OR 2203 OR 2800

CHEM2207: Intro to Organic Chemistry I

CHEM2203: Organic Chemistry I

CHEM2800: Foundations for Env Chemistry

Preclusions: N/A

Department/Unit: Chemistry

Topics Covered and Learning Outcomes

I am committed to providing an inclusive learning environment where all students feel respected and supported. Diverse perspectives and experiences enrich learning in environmental chemistry and toxicology, and students are encouraged to engage respectfully with one another. If any aspects of the course create barriers to your learning, please contact me so we can discuss appropriate support or accommodations.

Topics to be Covered

Date	Day	Topic/Content	Quiz Due Date
Sept 09	W	Course overview	
Sept 11	F	Toxicology – Foundations I	
Sept 16	W	Toxicology – Foundations II	
Sept 18	F	Toxicology – More depth + Worked examples + CS 2–3	
Sept 23	W	Toxicology – Additional concepts/practice + CS 2–3	Toxicology Quiz
Sept 25	F	The Hydrosphere – Foundations I	
Sept 30	W	The Hydrosphere – Foundations II	
Oct 02	F	The Hydrosphere – Foundations III + CS 2–3	
Oct 07	W	The Hydrosphere – More depth + Worked examples + CS 3–4	
Oct 09	F	The Hydrosphere – Additional concepts/practice + CS 3–4	Hydrosphere Quiz
Oct 14	**W**	**MIDTERM**	
Oct 16	F	Pollutant analysis – Foundations I	
Oct 21	W	Pollutant analysis – More depth + Worked examples + CS 2–3	
Oct 23	F	Pollutant analysis – Additional concepts/practice + CS 3–4	
Oct 28	W	**FALL BREAK**	
Oct 30	F	**FALL BREAK**	
Nov 04	W	SETAC – class cancelled	Analysis Quiz
Nov 06	F	Microbial Life – Foundations I	
Nov 11	W	Microbial Life – More depth + Worked examples + CS 2–3	
Nov 13	F	Microbial Life – Additional concepts/practice + CS 3–4	
Nov 18	W	Chemistry of Waste 1 – Foundations I	Microbial Quiz
Nov 20	F	Chemistry of Waste 2 – More depth + Worked examples + CS 2–3	
Nov 25	W	Chemistry of Waste 3 – Additional concepts/practice + CS 3–4	
Nov 27	F	Atm Chemistry 1 – Foundations I	Waste Quiz
Dec 02	W	Atm Chemistry 2 – More depth + Worked examples + CS 2–3	
Dec 04	F	Atm Chemistry 3 – Additional concepts/practice + CS 3–4	
Dec 09	W	Catchup/Summary	Atm Chem Quiz

Case Study Roster	
Topic	Maximum # of presenters
Toxicology	6
Hydrosphere	9

Pollutant Analysis	7
Microbial Life	7
Waste	7
Atmosphere	6

Course level learning outcomes:

1. Evaluate multidisciplinary issues using chemical toxicology and environmental chemistry knowledge and skills.
2. Describe major biochemical pathways targeted by toxicological hazards.
3. Relate physicochemical properties of chemicals to principles of ADME.
4. Apply chemistry principles to predict the transport and fate of chemicals in the environment.
5. Describe various instrumentation and quantitation techniques that can be used for pollutant analysis.
6. Develop principles of effective communication, proficiency in structuring and organizing content for clear and compelling presentations.

Assessments

Grade Breakdown

COMPONENT	GRADE VALUE	FORMAT	DATE
SIX ONLINE QUIZZES	20 %	Best 5 of 6	Sept 23, Oct 9, Nov 4, Nov 18, Nov 27, Dec 9
PRESENTATION	15 %	Individual, 5-6 min	
PARTICIPATION	5 %	Completion/credit system	
MIDTERM	25 %	Multiple choice; short answer	Oct 14
FINAL EXAM	35 %	Cumulative	Scheduled exam period

Online quizzes: six short online quizzes will be completed independently over Brightspace outside of class following each course unit. The best five quiz grades will each contribute 4% to the final grade.
Participation: Students can earn participation credit throughout the semester by making meaningful contributions to class activities and discussions, including asking or answering questions following student case studies and participating in worked problems. Multiple opportunities to earn credit will be provided; attendance alone does not constitute participation.

Late and Missed Work Policies

Missed Work

- **Deferred/missed term work for short-term accommodation (5 days or less)**: Please submit to me via email the academic considerations form to discuss the appropriate accommodation.
- **Long-term accommodation (greater than 5 days):** Please email me for guidance about how accommodation needs can be met for CHEM3800. You will need to go to the Registrar's Office for support and/or the Paul Menton Centre and/or Care Support Team, but I need to be apprised of the long-term accommodation needs.

- Students studying remotely or varsity athletes with in-person tests or exams can apply to write their exam off-campus if they will be at least **160 km** away from campus on the exam day and meet the course requirements for distance exams.

This service has a fee, and all exams must be proctored.

The deadline to apply for a distance exam for the Fall term is September 24.

You can find the **Distance Exam Request Form** here:
https://carleton.ca/ses/examination-services/distance-exams/

Learning Material(s) and Other Course/Lab-Related Resources

Students are not required to purchase textbooks or other learning materials for this course.

Suggested textbook:
G. vanLoon and S. Duffy (2011). *Environmental Chemistry: A Global Perspective, 3 Ed*. Oxford University Press.

Academic Accommodations and Regulations

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes are outlined on the Academic Accommodations website (https://students.carleton.ca/course-outline/).

Statement on Chat GPT/Generative AI usage

The use of generative artificial intelligence tools (e.g., ChatGPT) is not permitted for assessments in this course unless explicitly stated in the assignment instructions. Where AI use is permitted, students are responsible for ensuring that their work reflects their own understanding and reasoning and for complying with all academic integrity requirements. If you are unsure whether AI tools may be used for a particular assessment, you must consult the instructor in advance.

Statement on Academic Integrity

Students are expected to uphold the values of academic integrity, which include fairness, honesty, trust, and responsibility. Examples of actions that compromise these values include, but are not limited to, plagiarism, accessing unauthorized sites for assignments or tests, unauthorized collaboration on assignments or exams, and using artificial intelligence tools such as ChatGPT when your assessment instructions say it is not permitted.

Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in Carleton University's Academic Integrity Policy. A list of standard sanctions in the Faculty of Science can be found here.

Additional details about this process can be found on the Faculty of Science Academic Integrity website.

Students are expected to familiarize themselves with and abide by Carleton University's Academic Integrity Policy.

Student Rights & Responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the 7 Rights and Responsibilities Policy for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

Student Concerns

If a concern arises regarding this course, **your first point of contact is me**: Email or drop in during student hours and I will do my best to address your concern. If I am unable to address your concern, the next points of contact are (in this order):

Note: You can also bring your concerns to Ombuds services.