

The Chemistry of Environmental Pollutants

CHEM3800A (Fall 2023)

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 a 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.

I will respond to emails/messages about **lecture material** during student hours ONLY. Any **academic accommodations and missed course work** will receive a response from me within one business day.

Student Hours: Wednesday & Friday, 1-2 pm

What are 'Student Hours'?

Student hours are dedicated times through the week for the course instructor to meet with YOU. Pop in to introduce yourself, ask questions about the course, or discuss content from the course.

Note: If these times don't work for you, email me and we can arrange an alternate time to meet.

Office Location: Room 320, Steacie Building

[Click here for visual directions.](#)

Class Location: Room 238, Tory Building

[Click here for visual directions.](#)

Class Times: Wednesday & Friday, 4:35pm-5:55pm

Prerequisites: CHEM2207 or 2203 or 2800

Department/Unit: Chemistry

Teacher's Assistant: Leo Tse

Email: leotse@cmail.carleton.ca

Welcome!

This course will build on the chemistry knowledge acquired in first and second year and apply it to problems in environmental science, with a focus on contaminants in biota, water, and air. It covers topics such as the sources, fate, transport, and transformation of pollutants, the chemistry of natural systems, and the impact of human activities on environmental quality. The course will also provide an opportunity to work in a group preparing a presentation of a case study in environmental chemistry. An existing knowledge of basic organic and analytical chemistry is expected and will not be reviewed in class.

Course level learning objectives:

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. – Understand the components of information literacy and its importance.
5. – Apply chemistry principles to predict the transport and fate of chemicals in the environment.
6. – Develop principles of effective communications, proficiency in structuring and organizing content for clear and compelling presentations.
7. – Gain confidence in overcoming public speaking anxiety and managing nerves.
8. – Receive constructive feedback and learn to provide meaningful evaluations to peers.

Inclusive teaching statement:

I am committed to fostering an inclusive and equitable learning environment that values the diverse perspectives and experiences of every student. I recognize the importance of creating a space where all students feel respected, valued, and empowered to contribute. I believe that diversity in all its forms enriches the educational experiences. I am committed to providing equal learning opportunities for all students and am mindful of potential barriers to learning and work to create an environment where each student has access to accommodations needed to excel. Throughout the semester, there will be opportunities to provide feedback to adapt teaching methods, materials, and assessments to suit student needs and enhance learning experiences.

Land Acknowledgement

Here at Carleton University, it is important that we acknowledge that the land on which we gather is the traditional and unceded territory of the Algonquin nation.

DATE	DAY	THEME	LEARNING OUTCOMES	IN PERSON?	ASSIGNMENT DUE DATE
Sep 06	W	Syllabus		Y	
Sep 08	F	Info Literacy & Toxicology 1	1-4	Y	
Sep 13	W	Info Literacy & Toxicology 2	1-4	Y	
Sep 15	F	Info Literacy & Toxicology 3	1-4	Y	
Sep 20	W	The Hydrosphere 1	5	Y	
Sep 22	F	The Hydrosphere 2	5	Y	Assignment 1
Sep 27	W	The Hydrosphere 3	5	N – Recorded	
Sep 29	F	The Hydrosphere 4	5	N – Recorded	
Oct 04	W	Science Communication	6,7	Y	
Oct 06	F	Water Pollution: Case Study	5	Y	
Oct 11	W	MIDTERM		Y	
Oct 13	F	Microbial Life I (Dr. T Harris)	5	Y	
Oct 18	W	Microbial Life II (Dr. T Harris)	5	Y	
Oct 20	F	Chemistry of Waste I	5	Y	Presentation Outline (10%)
Oct 25	W	FALL BREAK			
Oct 27	F	FALL BREAK			
Nov 01	W	Chemistry of Waste II	5	Y	
Nov 03	F	Atm Chemistry I	5	Y	
Nov 08	W	Atm Chemistry II (Dr. J Corbin)	5	Y	Assignment 2
Nov 10	F	Student Presentation 1-2	6-8	Y	
Nov 15	W	Student Pres 3-4	6-8	Y (Record)	
Nov 17	F	Class cancelled			
Nov 22	W	Student Pres 5-6	6-8	Y	Assignment 3
Nov 24	F	Student Pres 7-8	6-8	Y	
Nov 29	W	Student Pres 9-10	6-8	Y	
Dec 01	F	Student Pres 11-12	6-8	Y	
Dec 06	W	Student Pres 13-14	6-8	Y	Reflections

Note: Some classes might be moved online pending unforeseen illness, etc.

Learning Materials

Suggested textbook:

G. vanLoon and S. Duffy (2011). *Environmental Chemistry: A Global Perspective, 4 Ed.* Oxford University Press.

Technology Checklist:

- An internet-enabled computer (laptop/desktop)
- Zoom software installed on computer (can also install on phone as backup!)
- Access to reliable internet

For students who do not have access to these resources: Options include financial aid from Carleton, inexpensive options for technology (Best Buy refurbished products, Kijiji), & single workspaces available for student use on campus.

Assessment in this Course

Research about learning strongly suggests that the most important factor in learning is doing the work of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why we have high standards in this course. We are confident that, with appropriate effort, you **all** can meet those standards.

I will reduce unintentional bias in grading by using methods such as grading assignments one question at a time (i.e., grading all of question 1 before grading any of question 2), grading anonymously, and using rubrics.

Grade Breakdown

COMPONENT	GRADE VALUE
ASSIGNMENT 1	10%
ASSIGNMENT 2	15%
ASSIGNMENT 3	10%
MIDTERM	25%
PRESENTATION	30%
REFLECTIONS & EVALUATIONS	10%

Assignments

There are three assignments in this course. Full assignment descriptions and marking rubrics will be posted on Brightspace.

ASSIGNMENT	GRADE VALUE	TOPIC	DUE
1	10%	Info Literacy & Tox	Sep 22
2	15%	Microbial Life & Waste Chem	Nov 08
3	10%	Atm Chem	Nov 22

Late Assignment Penalties:

Late assignments will lose 10% per day (1 grade point value). An assignment can no longer be submitted 9 days following its initial deadline.

Midterm Exams

One midterm will take place in the classroom. The midterm will consist of multiple choice, short answer and problem-solving questions like the ones that we have practiced in the course.

MIDTERM	GRADE VALUE	TOPIC	DATE
1	25%	Info Literacy, Tox, The Hydrosphere & Water Pollution	Oct 11

Looking for help preparing for midterms? [Student Academic Success Services \(SASS\)](#) at Carleton offers course-targeted study groups and supports and the [Science Student Success Centre \(SSSC\)](#) provides help with study skills.

Presentations, reflections, peer-evaluations

There will be group presentations of 4-5 students per group, expected to take 40 minutes of class time. More detail on the expectations for the presentation and the written evaluations/reflections will be provided.

Feeling Sick?

If you feel very sick (e.g., fever, chills, upset stomach) do not come to class or campus. Missed lectures can be made up by watching the recorded lecture, which I will post on Brightspace within 24 hours after the lecture.

Mental Health

If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. In terms of class, if you need extra help or missed a lesson, don't stress! Email me and we will set a time to meet. Remember that Carleton also offers an array of mental health and well-being resources, which can be found [here](#).

University Policies

In accordance with the Carleton University Undergraduate Calendar Regulations, the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59
A = 85-89	B = 73-76	C = 63-66	D = 53-56
A- = 80-84	B- = 70-72	C- = 60-62	D- = 50-52
F = <50			

WDN = Withdrawn from the course

DEF = Deferred

Academic Accommodations, Regulations, Plagiarism, Etc.

Carleton University is committed to providing access to the educational experience to promote academic accessibility for all individuals.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University.

More information can be found at: <https://students.carleton.ca/course-outline/>

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the [Paul Menton Centre website](#).

Addressing Human Rights Concerns

The University and all members of the University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the [Department of Equity and Inclusive Communities](#) at equity@carleton.ca.

Religious Obligations

Please contact me with requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the [Student Guide to Academic Accommodation \(PDF, 2.1 MB\)](#).

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/sexual-violence-support/>

Accommodations for Missed Work

Notify me within 24 hours of the missed work. Carleton recognizes that students may experience unexpected, temporary incapacitation (i.e., illness, injury, or extraordinary circumstances outside of a student's control). As a result, Carleton has put into place a protocol for students to apply for accommodations using a self-declaration form in the event of missed work. The form can be found at: <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf> Note that these forms should be used for short-term concerns related to missed work; if you are experiencing chronic, ongoing challenges which necessitate a broader solution, I recommend reaching out to the Paul Menton Centre and/or the Care Support team.

For Pregnancy

Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the [Student Guide to Academic Accommodation \(PDF, 2.1 MB\)](#).

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the [Senate Policy on Accommodation for Student Activities \(PDF, 25KB\)](#).

Academic Integrity

Academic Integrity is upholding the values of honesty, trust, respect, fairness, responsibility, and courage that are fundamental to the educational experience. Carleton University provides supports such as academic integrity workshops to ensure, as far as possible, that all students understand the norms and standards of academic integrity that we expect you to uphold. Your teaching team has a responsibility to ensure that their

application of the Academic Integrity Policy upholds the university's collective commitments to fairness, equity, and integrity.

(Adapted from [Carleton University's Academic Integrity Policy](#), 2021).

Examples of actions that do not adhere to Carleton's Academic Integrity Policy include:

- Plagiarism
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Using artificial intelligence tools such as ChatGPT when your assessment instructions say that it is not permitted

Please review the checklist [linked here](#) to ensure you understand your responsibilities as a student with respect to academic integrity and this course.

Sanctions for Not Abiding by Carleton's Academic Integrity Policy

A student who has not upheld their responsibilities under Carleton's Academic Integrity Policy may be subject to one of several sanctions. A list of standard sanctions in 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 follow the Carleton University [Student Academic Integrity Policy](#). The Policy is strictly enforced and is binding on all students.

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.

Assistance for Students

Academic and Career Development Services: <http://carleton.ca/sacds/>

Writing Services: <http://www.carleton.ca/csas/writing-services/>

Peer Assisted Study Sessions (PASS): <https://carleton.ca/csas/group-support/pass/>

Math Tutorial Centre: <https://carleton.ca/math/math-tutorial-centre/>

Science Student Success Centre: <https://sssc.carleton.ca/>