

CHEM 1004: Drugs and Human Body (Winter 2026)

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: Apollo Tsopmo

Gender Pronouns: (he/him)

Email: apollinaire.tsopmo@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.

Best Ways to be in Touch: in class, via email, or through an appointment at my office

Student Hours: By appointment

Office Location: Room 207D Steacie Building

Class Location: Please check Carleton Central for the room location.

Class Times: Fridays, 11:30 am – 2:30 pm

Prerequisites: N/A

Preclusions: N/A

Department/Unit: Chemistry

Description:

This course offers an intuitive and engaging introduction to the science of drugs and their effects on the human body, designed for students with minimal background in science. Students will explore the basic structures and properties of organic molecules and how they are used by chemists to design and develop drugs. The course examines how drugs interact with biological systems to produce therapeutic or psychoactive effects

. An emphasis is placed on pain development and control, the function of the immune system, and the complex ways in which certain substances can alter brain chemistry and behaviour, leading to tolerance, withdrawal, and addiction.

I am here to help you succeed by answering questions in class, providing review questions, answering e-mail messages, and offering office appointments. If you put in effort, I am confident that you can achieve your target grade.

Materials: Online resources are available on Brightspace. If you are interested in extra material for this course, I recommend Khan Academy [Chemistry](#) and [Biology](#). Students are not required to purchase textbooks or other learning materials for this course.

Attendance: Attendance is mandatory. This is a lecture-based course. All testable material will be covered in class.

Topics to be Covered

Detailed list of topics to be covered, including dates and required reading for each week.

Week	Topic/Content	Readings/Prep for Class
1	Introduction: Body organization, Solubility of molecules, Receptors, Drug administration, Macromolecules, Nucleotides	13.2: Organization of the Human Body - Biology LibreTexts Overview of Pharmacodynamics - Clinical Pharmacology - Merck Manual Professional Edition Pharmacokinetics & Pharmacodynamics.: https://www.ncbi.nlm.nih.gov/books/NBK595006/
2	Introduction to organic chemistry: Structures, Bonding, Functional groups, Properties, Drug metabolism	1: Basic Concepts in Chemical Bonding and Organic Molecules - Chemistry LibreTexts
3	Pain and Inflammation: Cell membrane channels, Synapse; Pain modulation, Analgesics, Anesthetics	Pain Management Medications. StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK560692/
4	The immune system: Immune & lymphatic systems Antibodies-antigens, Allergies; Antihistamines Asthma & anaphylaxis, Immunosuppressants, Vaccines	Overview of the Immune System - Immune Disorders - Merck Manual Consumer Version
5	Anti-infectives: Antibiotics, Antifungals, Antivirals, Antiparasitics	Overview of Antibacterial Drugs – Merck Manual
6	Tumor and cancer: Definition & Incidence, Chemotherapeutic agents (types and mechanisms)	Overview of Cancer Therapy https://www.drugs.com/drug-class/alkylating-agents.html

8	Endocrine system: Type of systems, hormones (production, control and function)	An Overview of the Endocrine System – Anatomy & Physiology 2e (Open Educational Resource) Endocrine System -
9	Mental Health: Anxiolytics, Mood stabilizers, Anti-psychotics, Schizophrenia	General Overview of Mental Health Medication Psychological Medications and Their Role in Mental Health Treatment
10	Addiction: Alcohol, Depressants, Opioids, Caffeine Nicotine, Amphetamine, Cocaine, Hallucinogens	Overview of Substance Use – Merck Manual Professional Edition Addiction Medicine Primer – CDC
11	Cannabinoids: History, Biosynthesis, Role, Endocannabinoid system, Addiction	Introduction and Origins of Cannabis in Medicine Overview of the Endocannabinoid System – Open Educational Resource
12	The cardiovascular system: Function, Diseases, Blood pressure control, Clot busters and blood thinners, Angina	Heart Anatomy, Regulation of the Vascular System

Important dates and deadlines can be found here: [The Academic Year \(Graduate and Undergraduate Studies\) < Carleton University](#), including class suspension for fall, winter breaks, and statutory holidays

Assessments

Grade Breakdown

COMPONENT	GRADE VALUE	DATE
MIDTERM 1	25 %	Feb 1, 2026
MIDTERM 2	25 %	March 2, 2026
MIDTERM 3	25 %	March 23, 2026
FINAL EXAM	25 %	To be determined

Evaluation: 3 midterms, one final exam.

Assessment: Your grade will be calculated based on 3 midterms and a final exam. See the section Late Policy in case of missed midterm(s).

- **You must complete all 3 midterms and the Final Exam to pass this course.**
- **Failure to complete any midterm/Exam in the course will result in a 0% grade for that midterm and a 25% reduction in final grade.**

- **Students that do not complete/miss at least 2 midterms will not be able to pass the course.**

Examination style: Questions are a mix of application and knowledge based on lecture material. Questions are multiple choice or true/false. There will be a review for each midterm hosted by the TAs.

Access: Midterms are available through BrightSpace and will open at midnight and close at 11:59PM the following day (you have 24 hours to write the midterm). You can start the midterm at any time within that 24 h period. **Do not start a midterm past 11:20PM because it may close before you finish resulting in a 0% grade.**

Midterm rescheduling: Missed midterms **may** be rescheduled on a case-by-case basis. There is no guarantee that a midterm may be rescheduled for a student if that student failed to justify their absence.

Late and Missed Work Policies

Failure to complete any midterm/Exam in the course will result in a 0% grade for that midterm and a 25% reduction in final grade.

In case you have a valid reason to justify your absence, complete one of the two forms below

- 1) **Missed work less than 5 days (assignments):** Complete a self-declaration using the online [Academic Consideration for Coursework Form](#). If you don't have medical documentation.
- 2) **Missed work longer than 5 days:** Submit the [Long Term Academic Consideration Request Form](#).

How to Succeed in CHEM 1004

- Attend lectures.
- Take notes. Slide content will be elaborated on during lecture, key concepts will be highlighted in class that will be on the midterms.
- Communicate: If you need help on a concept, or have a question about the material, send me and/or the TA an e-mail! Try to keep the question brief and focused so we can answer them properly.
- More important dates and deadlines for the Winter 2026 term can be found [here](#).

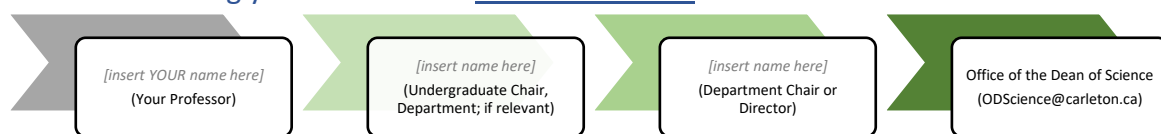
Academic Integrity

- Any suspected violation of [Carleton University's Academic Integrity Policy](#) will be reported to Chemistry Department.
- Midterms: Sharing answers during midterms is not allowed. Due to the online nature of the midterm, I ask that you do not participate in a chatroom or in any way share/provide answers regarding any midterm in CHEM1004. This has occurred in the past- someone inevitably takes a screenshot of the chatroom (usually Discord) and reports it to the administration and/or prof (me). Everyone involved ends up in some sort of trouble. University is a time to make connections and learn skills that you will apply in the future. Doing something silly like this can compromise your academic future and can hurt your reputation (e.g., you may struggle to get a reference letter from a prof in the future if you have academic violations attached to you). **Your reputation as a person is worth more than how many followers you have.**
- **Tldr:** write the midterms alone, don't share answers with other students.
- Please reach out to me if you have any questions about Academic Integrity and read the [University's Policy](#).

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](#).



Internet/Computers Policy

- Not having access to the internet/electronic device will not be accepted as a valid reason for missing a midterm. Please contact Information Technology Services (ITS) Service Desk if you have any questions: <https://carleton.ca/its/>
- Carleton University MacOdrum Library also has computers available for students to use.

Links

- Academic Integrity: <https://carleton.ca/registrar/academic-integrity/>
- Academic Accommodations: <https://students.carleton.ca/course-outline/>
- Carleton Health and Counselling Services: <https://carleton.ca/health/>
- Carleton Information Technology Services: <https://carleton.ca/its/>
- Carleton Library: <https://library.carleton.ca/>
- Carleton VPN: <https://carleton.ca/its/help-centre/remote-access/>