

# CHEM 3205 for Winter 2025 (Updated Dec 19, 2024)

Experimental Organic Chemistry

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:** Jeff Manthorpe

**How to address me:** Professor Manthorpe, Dr. Manthorpe, Jeff

**Gender Pronouns:** (he/him/his)

**Email:** [jeff.manthorpe@carleton.ca](mailto:jeff.manthorpe@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 outside of class.

**Best Ways to be in Touch:** in class, via email, or during student hours

**Student Hours:** To be determined (will be a total of  $\geq 3$  hours/week), SC 418

**Office Location:** Room 418, Steacie Building

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

**Class Times:**

A section: 1:35–5:25 Wednesdays

B section: 8:35–12:25 Thursdays

**Prerequisites:** CHEM 2204 and CHEM 3201

**Preclusions:** None

**Department/Unit:** Chemistry

**Lab Coordinator:**

**Elena Munteanu** (she/her/hers)

([ElenaMunteanu@cunet.carleton.ca](mailto:ElenaMunteanu@cunet.carleton.ca))

**Course TAs:**

**Daniel Knight** (he/him/his)

([DanielKnight@cmail.carleton.ca](mailto:DanielKnight@cmail.carleton.ca))

**Jake Edgley** (he/him/his)

([JakeEdgley@cmail.carleton.ca](mailto:JakeEdgley@cmail.carleton.ca))

---

## Topics Covered and Learning Outcomes

We are committed to fostering an environment for learning that is inclusive for everyone regardless of gender identity, gender expression, sex, sexual orientation, race, ethnicity, ability, age, class, etc. All students in the class, the instructor, the lab coordinator, teaching assistants and any guests should be treated with respect during all interactions. It is our hope that our class will support diversity of experience, thought, and perspective.



### Course Description

A laboratory-based course including advanced concepts and techniques in organic synthesis, structure determination, and the rates and mechanisms of reactions. Students are responsible for literature surveys, acquisition of theoretical background, and design of experimental procedures.

Includes: Experiential Learning Activity

Laboratory 4 hours a week.

### Topics to be Covered

Week	Topic/Content	Report Due	Report Types Due
Jan 8,9	Experiment 1 (SciFinder)	N/A	N/A
Jan 15, 16	Experiment 2 (Enantiomers)	SciFinder	Assignment
Jan 22, 23	Experiment 3 (4,4'-di- <i>tert</i> -butylbiphenyl)	N/A	N/A
Jan 29, 30	Experiment 4 (Horner-Wadsworth-Emmons)	Enantiomer	Short report
Feb 5, 6	Experiment 5 (Glucose pentaacetate)	4,4'-di- <i>t</i> -butylbiphenyl	Short report
Feb 12, 13	Experiment 6 (Photochemistry)	Horner-Wadsworth-Emmons	Short report
Feb 17-21	 WINTER BREAK 	N/A	N/A
Feb 26, 27	Experiment 7 (Identification of Unknown)	Glucose pentaacetate	Formal report
Mar 12, 13	Experiment 8 (Diels-Alder part 1)	Unknown	Assignment
Mar 19, 20	Experiment 8 (Diels-Alder part 2)	N/A	N/A
Mar 26, 27	Interview	Diels-Alder reaction	Formal Interview

### Course level learning outcomes:

1. Improved understanding of the chemical literature, how to search and cite literature sources
2. Reinforced organic chemistry laboratory skills
3. Mastery of NMR, IR spectroscopic analyses, as well as other analyses (e.g., melting point) of experiment product(s)
4. Continued development of report-writing skills

## Assessments

Grade Breakdown (*see lab manual for more information and sample calculation*)

COMPONENT	GRADE VALUE	APPLICABLE EXPERIMENTS
1. PRELAB/NOTEBOOK	30 marks/experiment; avg grade used	2–8
2. QUIZZES	20 marks/experiment; avg grade used	2–8
3. LAB SAFETY AND TECHNIQUE	30 marks/experiment; avg grade used	2–8
4. SHORT REPORT/ INFORMAL INTERVIEW/ ASSIGNMENT	40 marks/experiment; avg grade used	1–8
TOTAL LAB PERFORMANCE	120 marks/experiment (sum of items 1–4 above); grade out of /120. Counts as 70% of course grade	1–8
FORMAL REPORT	15%	5
FORMAL INTERVIEW	15%	8
TOTAL COURSE MARK	Total lab performance (70%) + Formal report (15%) + Formal Interview (15%) = 100%	1–8

**Note:** It is mandatory to complete and submit all of the assignments, short reports, formal report and formal interview to pass the course.

## Late and Missed Work Policies

### Late Work

Reports must be submitted on due date; 10% will be deducted off the mark for the first day late and 5% for each of the next three days unless satisfactory arrangements have been made with the Laboratory Supervisor well in advance of the due date. Formal reports later than 4 days after the due date are not accepted and a grade of 0 will be given. A weekend is counted as 2 days.

### Missed Work

Typically, if one experiment is missed the experiment can be rescheduled.

Further discussions with lab coordinator and instructor are required if more than one experiment is missed.

---

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

Ancillary fees associated with this course, e.g., textbooks, course packs, lab manuals, field work, online resources or links required for the course along with their associated cost (if applicable). Estimated costs can be acquired based on current bookstore offerings, Amazon, etc.

Learning Material	Options for Purchasing (e.g. <i>Bookstore, Used, etc.</i> )	Approximate Cost
Lab Manual (required, must be 2025 edition)	Carleton University Science Stores	\$15
New lab notebook (must be for CHEM 3205 only)	Carleton University Science Stores, Carleton University Bookstore	\$10

---

## 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

As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

AI is not going to write your exams for you. AI cannot do your synthetic planning for you (yet). Organic chemistry is advanced by people knowing the fundamentals of the field and generating new ideas based on those fundamentals. Therefore, if you don't understand the fundamentals, you cannot advance organic chemistry (or any science), and AI is more than a decade away from making meaningful contributions in this way. I have personally tested AI writing and research abilities in organic chemistry, and they are woefully inadequate.

The goal of adopting a limited use of AI is to help students develop foundational skills in writing and critical thinking by practicing substantive content creation with little support from AI. The ability to clearly and concisely communicate scientific information is a fundamental skill in a BSc degree and a course-level learning outcome of this course. Organic chemistry employs more chemists than any field, with the possible exception of analytical chemistry. If you do not understand fundamental organic chemistry and adequately communicate it, you are missing out on the single largest employment sector for chemists. Moreover, these communication skills translate across all areas of science; thus, if your report-writing skills (in English) are not strong, you need to continue to improve them. The best ways to do this include:

1. Review the expectations for the structure, content and formatting of your report and any recommendations
2. Read relevant journal articles, review articles, advanced textbooks, encyclopedias, etc. for background information **and** stylistic structure, technical vocabulary and jargon. Keep a list of new words you encounter and their meaning(s).

3. Read sample reports, if they are available
4. Write your own report
5. If desired, use acceptable AI tools (see below) to assist in editing your writing

In this course, students may use **editorial AI** tools for basic word processing and formatting functions, including, (a) grammar and spell checking (e.g., Grammarly, Microsoft Word editing functions) and (b) basic formatting and design suggestions (e.g., Microsoft Word's formatting tools, PowerPoint Design editor).

The use of **generative AI** to do background research and writing (i.e., the AI is generating its own text (or other content) and not polishing your original writing) of lab reports/assignments, etc. is permitted in this course. However, it must be documented as described below. Furthermore, you are expected to rephrase the output in your own words. (This can be frustrating when the AI is a better, more concise writer than you are.)

### ***Documenting AI Use:***

1. **Editorial AI:** It is not necessary to document the use of **editorial AI** for the permitted purposes listed above
2. **Generative AI:** In the references for the report, assignment, etc., you must include the following:
  - a. proper citation of the AI tool used
  - b. the information given to the AI tool, *verbatim*
  - c. the output (text or otherwise) of the AI tool, *verbatim*
3. If you have questions about a specific use of AI that isn't listed above, please consult your lab coordinator or instructor

**Limitations on AI Use:** Any use of AI (for this course) not addressed herein should be discussed in advance with the lab coordinator or instructor.

### **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.

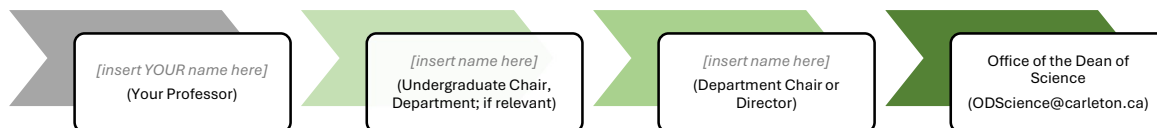
## Mental Health and Wellness:

As a student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. For more information, please consult <https://wellness.carleton.ca/>.

## 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

Writing and Learning Support: <https://carleton.ca/csas/support/>

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

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

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