



COURSE OUTLINE

1. **Course:** CHEM 453, Advanced Organic Chemistry - Fall 2020

Lecture 01: MWF 11:00 - 11:50 - Online

Instructor	Email	Phone	Office	Hours
Dr Thomas Back	tgback@ucalgary.ca	403 220-6256	SB 217	TBA

In Person Delivery Details:

The laboratory will consist of both a computer molecular modeling component and a "wet" lab.

The **modeling component** will be held in person and will consist of three computer molecular modeling experiments which will be conducted in SA 247 between September 14-October 2. The room is sufficiently large to accommodate required distancing for each section, with a maximum of 14 students.

For the rest of the semester, students will conduct three "**wet**" **experiments** in person in EEEL 269. Some experiments will require more than one week to complete. Each section will be divided into two groups with a maximum size of 7, who will attend the laboratory in alternating weeks.

Students are required to wear masks and to practice all recommended hygiene protocols, in addition to the mandatory use of normal laboratory personal protective equipment (PPE). While the rooms for both the computer and wet labs are large enough to accommodate distancing requirements, movements of students during the labs and their interaction with TAs necessitate the use of masks. The class will be provided with more information about safety protocols and specific dates for laboratory experiments prior to the commencement of labs. During the alternating weeks when students are not attending the lab, videos of lab experiments will be provided and students will be asked to answer questions based on them.

Online Delivery Details:

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

Lectures will be synchronous and will take place online via Zoom on Monday, Wednesday and Friday from 11:00-11:50 am, as specified by the registrar. Presentations will be made using PowerPoint and the slides will be provided to students via D2L or through other means. However, lectures will not be recorded and **students are strongly urged to attend the online lectures**, as verbal explanations of the material and opportunities for questions will be provided. Students are urged to participate in the lectures by taking notes to supplement the PowerPoint presentations.

Students who have additional questions can submit them by e-mail, or for more extensive consultations can request a Zoom appointment with the instructor. The instructor will generally respond to e-mail queries during working days within 24 hours.

Midterm and final exams will be written synchronously online. Students are recommended to use Word for text answers and ChemDraw or a similar drawing program for structures. Alternatively, for students who prefer to write and draw by hand, the answers should be written legibly and scanned or photographed. In either case, **answers should be combined and submitted as a single PDF file.** Additional instructions will be provided prior to the exams.

Course Site:

D2L: CHEM 453 L01-(Fall 2020)-Advanced Organic Chemistry

Note: Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s):

Chemistry 351; Chemistry 353, or 355.

3. Grading:

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Midterm exam	25	Nov. 4, 2020
Laboratory	30	Beginning Sept. 14th
Final exam	45	Registrar scheduled

For any synchronous assessment, time will be adjusted for SAS students if needed and accommodation for students will be done on a case-by-case basis. SAS students must notify the instructor of their arrangements at least two weeks before the date of the exam.

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	85 %	80 %	77%	71%	69 %	67 %	60%	56%	54 %	50 %

Each component (lab reports, midterm exam and final examination) submitted by the student will be assigned a percent grade. The student's grade for each component listed above will be adjusted with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade. The conversion between the percentage grade and letter grade is as shown above.

This course has a registrar scheduled final exam.

Students will be expected to understand the material covered in all components of the course at every stage. In order to satisfy prerequisite requirements (i.e. C-) for further Chemistry courses, a student must meet the following requirements:

- (1) achieve a minimum 50% in the laboratory grading, and
- (2) achieve either a minimum 50% on the final examination, or a minimum 50% weighted average on the midterm and final examinations.

This means that **if a student scores below 50% in either the laboratory component or the examinations, then the maximum course letter grade they can obtain in CHEM 453 is a D+.**

This course has a registrar scheduled final exam.

Any student who is unable to attend the lab because of COVID-19 or related concerns may be eligible for a deferral of term work to permit them to complete the lab in the fall semester of 2021; the student's grade would be posted as a GP (grade pending) until completion of the deferred laboratories in 2021. **Students who are unable to attend the lab due to extenuating circumstances should contact the course instructor no later than September 16, 2020.**

Laboratory Exemptions. Students repeating the course within the last two years can be exempted from the Laboratory Component of the course if a grade of 75% or higher was obtained on the lab portion. Students choosing to exempt from the lab should be aware that the lab grade achieved on the previous attempt will be carried forward to the current year.

Prior to applying for an exemption, students are encouraged to connect with their course instructor or coordinator to better understand the risks and benefits in their specific online course, as well as what access they will (or will not) have to lab materials or feedback as an exempt student.

Students applying for a lab exemption should contact the Undergraduate Science Center (science.advising@ucalgary.ca) no later than Monday September 14th, 2020 to apply. Students registering in the course after this date should contact the USC as soon as possible if they wish to apply for an exemption.

4. Missed Components Of Term Work:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

There will be no make-up midterm exam; if a student misses the exam for legitimate reasons, the final exam will count for 70% of the final grade.

If a student misses a lab for legitimate reasons, attempts will be made enable the student to make up the lab in another section. However, since lab sections will likely be full and distancing must be strictly enforced, such arrangements will be made on a case-by-case basis.

5. **Scheduled Out-of-Class Activities:**

The following out of class activities are scheduled for this course.

Activity	Location	Date and Time	Duration
Midterm	Web-Based	Wednesday, November 4, 2020 at 7:00 pm	3 Hours

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

The midterm exam will be synchronous and held online on Wednesday, November 4, 2020 from 7:00-9:00 pm. The exam itself is designed to take two hours to complete. An extra hour will be provided for unexpected technical issues in submitting answers electronically. Thus, students will have a total of three hours in all to submit their answers. Time will be adjusted for SAS students on a case-by-case basis. Further details will be provided prior to the exam.

6. **Course Materials:**

Recommended Textbook(s):

B. Miller, *Advanced Organic Chemistry - Reactions and Mechanisms* (Note it is available at Bound and Copied, not at the bookstore): Prentice Hall.

Students are advised to keep whichever book they used in their Introductory Organic Chemistry course (300 level) for background information. A molecular model kit is also recommended.

PowerPoint slides used in lectures will be made available to the class, but recordings of the lectures will not be provided.

Computers and appropriate software will be provided for the molecular modeling component of the lab.

Students will require either Word and Chem Draw (or a similar drawing program) for writing exam answers, or a scanner in the case of hand-written answers. Students who do not have a scanner may photograph their answers instead. Answers must be clearly legible in any case.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

7. **Examination Policy:**

Students can write the midterm and final exams at home or at another place of their choosing but no aids or consultations with others are allowed. Further details on the submission and administration of the exams will be provided prior to the exams.

Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

10. **Human Studies Statement:**

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

11. **Reappraisal Of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. **Other Important Information For Students:**

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Center:** For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Chemistry, Dr. Yuen-Ying Carpenter by email

ahugchem@ucalgary.ca or phone 403-220-6908. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](#) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](#) Email: sciencerep@su.ucalgary.ca. [Student Ombudsman](#), Email: ombuds@ucalgary.ca.
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

Course Outcomes:

- Rationalize the properties of organic molecules and the outcome of organic reactions by using molecular orbital (MO) interactions as a unifying concept.
- Understand how frontier MO interactions and related stereoelectronic effects can affect the rates, regio- and stereochemistry of organic reactions.
- Understand the origin of the Woodward-Hoffman rules and how to apply them to the prediction and rationalization of a broad range of pericyclic reactions.
- Perform basic MO and molecular mechanics calculations and apply them to problems involving the structure and behaviour of organic molecules in a computer modelling laboratory.
- Re-examine concepts such as aromaticity and resonance from an MO perspective and apply these basic principles to a deeper understanding of a broad range of molecules, their properties and reactions.
- Understand how short-lived reactive intermediates govern the outcome of numerous types of organic reactions.
- Comprehend the basic principles of photochemistry and their application to organic reactions.
- Employ more advanced synthetic skills in the “wet” lab, as well as in recording and analyzing spectra for structure elucidation. Learn how to perform computer molecular modeling to predict structure and properties. Safety protocols will be emphasized throughout the laboratory component of the course.

Electronically Approved - Sep 04 2020 17:38

Department Approval

Electronically Approved - Sep 05 2020 12:05

Associate Dean's Approval