



COURSE OUTLINE

1. **Course:** CHEM 453, Advanced Organic Chemistry - Fall 2019

Lecture 01: MWF 11:00 - 11:50 in ENG 224

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

Course Site:

D2L: CHEM 453 L01-(Fall 2019)-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 6, 2019
Laboratory	30	TBD
Final Exam	45	registrar scheduled

Each of the above components will be given a letter grade using the official university grading system. The final grade will be calculated using the grade point equivalents weighted by the percentages given above and then converted to a final letter grade using the official university grade point equivalents.

This course has a registrar scheduled final exam.

Each piece of work (lab reports, midterm exam and 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 the percentage grade and letter grade is as follows.

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

Notes:

Students will be expected to understand at every stage the material covered in all components of the course. 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.

A student who misses the midterm exam for a legitimate reason (e.g. medical) will not be allowed to write a make-up exam. Instead, the grade on the final exam will count for 70% of the overall final grade.

A student who is repeating the course and has obtained at least 70% on the lab component may, upon request,

carry over the previous lab grade instead of repeating the lab.

4. Missed Components Of Term Work:

In the event that a student misses the midterm or any course work due to illness, supporting documentation, such as a medical note or a statutory declaration will be required (see [Section M.1](#); for more information regarding the use of statutory declaration/medical notes, see [FAQ](#)). Absences must be reported within 48 hrs.

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize themselves with these regulations. See also [Section E.3](#) of the University Calendar.

5. Scheduled Out-of-Class Activities:

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

Activity	Location	Date and Time	Duration
Midterm exam	EDC 179	Wednesday, November 6, 2019 at 7:00 pm	2 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.

6. Course Materials:

Recommended Textbook(s):

B. Miller, *Advanced Organic Chemistry - Reactions and Mechanisms 2004*: Prentice-Hall.

W.J. Hehre et. al., *The Molecular Modeling Workbook for Organic Chemistry 1998*: Wavefunction, Inc..

No Required Textbooks. This course recommends any Introductory Organic Chemistry text book such as those used in Chem 351/353 in previous years for useful background information.

Note: "The Molecular Modeling Workbook for Organic Chemistry 1998" is optional. It provides background on molecular modeling for students with special interest in the subject. It is not required for Chem 453 lab experiments.

The following texts contain supplementary material that is relevant to the course. Students are advised to consult them for additional information and insight into the material presented in lectures. They are available in the Reserve Reading Room of the library.

"Mechanism and Theory in Organic Chemistry" by T.H. Lowry and K.S. Richardson, Harper & Row, N.Y. (1976), or later editions.

"Orbital Interaction Theory of Organic Chemistry" by A. Rauk, J. Wiley & Sons, N.Y. (1994).

"Frontier Orbitals and Organic Chemical Reactions" by I. Fleming, J. Wiley & Sons, Chichester (1976).

7. Examination Policy:

No aids are allowed on tests or examinations.

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 **10 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 immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. 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:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. 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).
- 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. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **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. Farideh Jalilehvand by email ahugchem@ucalgary.ca or phone 403-220-5353. 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.

- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](#) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **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.
- i. **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.
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **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.
- l. **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.

Laboratory Breakage Fees and Locker Check-out: The Department of Chemistry has a laboratory glassware breakage fee. At the start of the course, each student is assigned a locker and checks-in to establish that they have a complete set of usable glassware. By signing for check-in, a student agrees that they are now responsible for the glassware until check out. Any equipment that is missing, unusable or has been replaced during the semester will be charged to the student. All students, even those who withdraw early from the course must check out of the laboratory before the last day of lectures. Any student who fails to check out before the last day of lectures for the term will be assessed a charge of \$30.00. If this fee is not paid by the last day of the final examination period of the term, an additional \$10.00 administrative fee will be charged and university services (registration, transcripts, etc.) may be withheld.

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.

Department Approval:

Electronically Approved

Date: 2019-09-03 08:36

Associate Dean's Approval for out of
regular class-time activity:

Electronically Approved

Date: 2019-09-03 13:31