

Chemistry 3373F Course Outline

Organic Chemistry III: Reactions and Strategies for Synthesis

1. Course Information

Course Information

Chemistry 3373F – [REDACTED]

Labs (one of): [REDACTED]

The labs will be held in [REDACTED] The schedule for the laboratory experiments is available in the lab manual and on page 2 of this outline.

Description

An intermediate level course in organic chemistry designed to complete the core requirements in organic chemistry. The major topics include: concepts of organic synthesis, radical chemistry, the chemistry of beta-dicarbonyls, amines, heterocycles, cycloadditions and pericyclic reactions.

List of Prerequisites

Chemistry 2273A and 2283G

Unless you have either the requisites for this course or written special permission from the Department of Chemistry to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

2. Instructor Information

| Instructors | Email | Office | Phone | Office Hours |
|-------------|------------|------------|------------|--------------|
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| TBD | | | | |
| TBD | | | | |

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

Learning objectives

1. To predict the chemical reactivity (mechanism and final products) of compounds containing aldehydes, ketones, amines, carboxylic acids and their derivatives, and organometallics.
2. To predict the mechanism and products (including stereochemical outcomes and applications of basic molecular orbital theory) of the reactions of dienes, including pericyclic reactions.
3. To apply basic nomenclature rules to name the above classes of compounds.
4. To design simple multistep syntheses involving the above functional groups.
5. To perform chemical reactions safely involving the above functional groups using organic synthetic laboratory techniques.
6. To analyze and interpret the results of organic chemistry laboratory work (e.g., spectral data) and compile these into a concise report.

Topics covered (chapters pertain to the course textbook)

1. Chapter 19: Aldehydes and ketones
2. Chapter 20: Carboxylic acids and their derivatives
3. Chapter 21: Alpha carbon chemistry: Enols and enolates
4. Chapter 16: Conjugated Pi systems and pericyclic reactions
5. Chapter 22: Amines
6. Chapter 23: Introduction to organometallic compounds (time permitting)

We will spend about 2 weeks on each topic.

Key Sessional Dates

Classes begin: September 4, 2025

Fall Reading Week: November 3 – 9, 2025

Classes end: December 9, 2025

Exam period: December 11 – 22, 2025

| Week of | Experiment | Report Due* |
|----------|---|-------------|
| Sept. 15 | Exp. 1: The Benzoin Condensation of Benzaldehyde | |
| Sept. 22 | Exp. 2: The Synthesis of Benzil Exp. 3: The Synthesis of <i>meso</i> -hydrobenzoin | Exp. 1 |
| Sept. 29 | No labs | |
| Oct. 6 | Exp. 4: The Synthesis of Tetracyclone Exp. 5: The Synthesis of Dilantin | Exps. 2 & 3 |
| Oct. 14 | No Labs | |
| Oct. 20 | Exp. 6: Fischer Esterification of a Chiral Alcohol Exp. 7: Transesterification: Synthesis of Biodiesel | Exps. 4 & 5 |
| Oct. 27 | Exp. 8: Synthesis of Dimedone | Exps. 6 & 7 |
| Nov. 3 | No labs | |
| Nov. 10 | Exp. 9: Diels-Alder Syntheses of Polycyclic Compounds | Exp. 8 |
| Nov. 17 | Exp. 9: Diels-Alder Syntheses of Polycyclic Compounds | |
| Nov. 24 | Exp. 10: Synthesis of a Secondary Amine via Reductive Amination | Exp. 9 |
| Dec. 1 | No Labs | Exp. 10 |

Lab reports are due by midnight on the day that is 1 week following the lab. [REDACTED]. Students are expected to submit each report by the deadline. However, should extenuating circumstances arise, a **48 h no-late-penalty period** is permitted for submission of the report (i.e., it may be submitted up until midnight on the 9th day following the lab). You do not need to contact the TA or instructor regarding these circumstances and **do not need to request academic accommodation**.

4. Course Materials

Text and other learning materials:

Organic Chemistry by Klein, 4th edition - This is the same text used in Chem 2273 and 2283; if you do not already have the text, you can purchase a 150 day E-book rental for \$57.00, E-book purchase for \$134.95, or print version for \$153.95 from www.wiley.com

Laboratory Manual for Chemistry 3373 and lab – Available at the campus bookstore for \$48.

Hayden-McNeil Organic Chemistry Laboratory Notebook for in-lab experiments – Available at the campus bookstore for \$16.05

(optional, but highly recommended) Molecular Model Set: Darling – Available at the campus bookstore for \$34.50.

Safety glasses with side panels (required if you do not already own a pair) – Available at the campus bookstore for \$7.75 or from Chem Club

Full length lab coat (required if you do not already own one) – Available at the campus bookstore for \$26.95

Class notes will be posted to Brightspace on a weekly basis: <https://westernu.brightspace.com/>

Students are responsible for checking the course site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

| | | |
|-----------------------|------------|---|
| Lab mark | 20% | |
| Mid-term Tests | 30% | Two midterms to be held during class [REDACTED] (15% each) |
| Quizzes | 10% | Best two out of three (5% each). These will be held in class [REDACTED] |
| Final Exam | 40% | |

Topics covered on each test, quiz, and the final examination will be posted closer to the date.

Use of Generative AI Tools

The use of artificial intelligence (AI) tools (e.g., ChatGPT, Copilot, Gemini) to generate content or perform analyses for any assignments associated with this course, and presenting it as one's original work is considered a violation of academic integrity, and is therefore **prohibited** in this course.

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- The final examination (Defined by policy)
- Laboratory reports (Defined by policy, deadline with a no-late-penalty period)
- Quizzes (Defined by policy, flexible completion)

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

Absences from Final Examinations

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

Midterm tests

If a mid-term test is missed for valid reasons, the 15% will be transferred to the final examination. Missing a test for a non-validated reason will result in a grade of zero for that midterm. There are NO alternate mid-term tests.

Missed laboratory sessions

Missed laboratory sessions must be for a validated reason. If a student misses a lab, they should contact the course instructor and teaching assistant within 48 hours. In validated circumstances and where the timing allows, students may be provided laboratory data enabling the student to submit the report (see details below regarding laboratory reports). If this is not possible, the weighting of the other labs will be adjusted so that the lab remains at 20% of the final mark. If attendance in the lab is required to fulfill the requirements for passing the course, you will have to apply for a grade of INC and complete the missed lab the next time the course is offered. If a student misses a laboratory session without a validated reason, they will be assigned a mark of zero for that laboratory and report.

Essential Learning Requirements

Even when Academic Considerations are granted for missed coursework, the following are deemed essential to earn a passing grade.

To pass you need i) a mark 50%, **and** ii) 50% or greater in your laboratory mark **and** iii) a passing grade in the non-laboratory component of the course. The final exam must be written. There are 8 laboratory sessions and 10 reports. To pass this course, you must attend at least 6 lab sessions and submit 7 reports.

In the event that the above conditions are not satisfied, a grade not higher than 40% will be assigned, even if the calculated grade is higher. Exception: Student who, for medical or compassionate reasons have been granted Incomplete Standing (INC grade) by the Dean's Office will be required to complete the missed work the next time the course is offered.

Coursework with Assessment Flexibility

By policy, instructors may deny Academic Consideration requests for the following assessments with built-in flexibility:

Flexible Completion

Quizzes. This course has 3 quizzes and the 2 quizzes with the highest marks are counted towards your final grade. Should extenuating circumstances arise, students do not need to request Academic Consideration for the first missed quiz. Academic consideration requests will be denied for the first missed quiz. Academic Consideration requests may be granted when students miss more than one quiz and these additional missed quizzes will be reweighted to the final exam. Missing a quiz for a non-validated reason will result in a grade of zero for that quiz. There are NO alternate quizzes.

Deadline with a No-Late-Penalty Period

Laboratory Reports. Students are expected to submit each of the assignments by the deadline (midnight one week following the laboratory session). Should extenuating circumstances arise, students do not need to request Academic Consideration or contact the instructor and they are permitted to submit their assignment up to **48 hours** past the deadline without a late penalty. Should students submit their assessment **beyond 48 hours** past the deadline, a late penalty of 10% per day will be applied. Academic Consideration requests may be granted only for extenuating circumstances that started before the deadline and lasted longer than the No-Late-Penalty Period (48 hours). After **7 days following the submission deadline, no further submission of reports will be permitted**, as the marked report may be returned by the TAs. In this case, either a mark of zero will be assigned (without Academic Consideration), or the weighting of the other lab reports will be adjusted so that the lab remains at 20% of the final mark (Academic Consideration granted for extenuating circumstances as described above).

Students with applicable accommodations recommended by Accessible Education can request penalty-free deadline extensions of **up to 7 days** from the original due date. Accommodated students who ask for a longer extension will be excused instead and the weight of the missed assignment will be transferred to the other labs. If submission of the report is required to fulfill the requirements for passing the course and your academic accommodation or consideration extends beyond the date that graded reports are returned, you will have to apply for a grade of INC and submit the missed lab report the next time the course is offered.

6. Additional Statements

6.1 Religious Accommodation

When conflicts arise with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible, but not later than two weeks prior to the writing of the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays - <https://www.edi.uwo.ca>

6.2 Academic Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as "appeals")

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences:

https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

6.5 Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at:

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. If you have any questions regarding accommodations, you may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to

help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.

This course is supported by the Science Student Donation Fund. If you are a student registered in the Faculty of Science or the Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing the online form linked from the Faculty of Science's Academic Advising site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the Chair of the Department or email the Science Students' Council at ssc@uwo.ca.