Western Science

Department of Chemistry

Chemistry 3373F Course Outline

1. Course Information

Course Information

Chemistry 3373F – MWF 11:30 am – 12:30 pm in TC 204

Labs (one of): Sec 013: M 1:30 – 5:30 pm
Sec 021: Tu 8:30 am – 12:30 pm
Sec 023: Tu 1:30 – 5:30 pm

The labs will be held in ChB 074. The schedule for the laboratory experiments in available in the lab manual and on page 3 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.

Prerequisites

Chemistry 2273A and 2283G

Unless you have either the requisites for this course or written special permission from your Dean's Designate to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Elizabeth Gillies (Professor)	egillie@uwo.ca	MSA 3202	x80223	Thursdays from 10:30 – 11:30 am (in person) or by appt. (in person or by zoom)
TA 1				
TA 2				
TA 3				

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 7, 2023
Fall Reading Week: October 30 – November 5, 2023
Classes end: December 8, 2023
Exam period: December 10 – 22, 2023

Laboratory schedule

Week of	Experiment	Report Due
Sept. 18	Exp. 1: The Benzoin Condensation of Benzaldehyde	
Sept. 25	Exp. 2: The Synthesis of Benzil Exp. 3: The Synthesis of *meso*-hydrobenzoin	Exp. 1
Oct. 2	Exp. 4: The Synthesis of Tetracyclone Exp. 5: The Synthesis of Dilantin	Exps. 2 & 3
Oct. 9	No Labs	
Oct. 16	Exp. 6: Fischer Esterification of a Chiral Alcohol Exp. 7: Transesterification: Synthesis of Biodiesel	Exps. 4 & 5
Oct. 23	Exp. 8: Diels-Alder Syntheses of Polycyclic Compounds	Exps. 6 & 7
Oct. 30	Fall Break - No Labs	
Nov. 6	Exp. 8: Diels-Alder Syntheses of Polycyclic Compounds	
Nov. 13	Exp. 9: Synthesis of Dimedone	Exp. 8

Nov. 20	Exp. 10: Synthesis of a Secondary Amine via Reductive Amination	Exp. 9
Nov. 27	No Labs	Exp. 10
Dec. 4	No Labs	

Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

4. Course Materials

Text and other Purchases:

Organic Chemistry by Klein, 4th edition

Laboratory Manual for Chemistry 3373 and lab.

Hayden-McNeil Organic Chemistry Laboratory Notebook for in-lab experiments

(optional, but highly recommended) Molecular Model Set: Darling.

Safety glasses with side panels (required if you do not already own a pair) and a full length lab coat

Students are responsible for checking the course OWL site (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Class notes will be posted to OWL: http://owl.uwo.ca.

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

Technical Requirements

Stable internet connection, computer with working microphone and webcam, if you would like to participate in office hours by zoom.

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 on Oct 6 and November 10 (15% each)
Quizzes	**10%**	Best two out of three (5% each). These will be held in class on Sept 20,

Oct 20, and Nov 27.

Final Exam **40%**

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

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 9 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.

6. Student Absences and Missed of Late Work

If you miss ANY component of the evaluation, regardless of its weight, due to illness or other serious circumstances and wish to be excused, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

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

The Student Medical Certificate is available at

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

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.

Quizzes

If one quiz is missed for validated reasons, the other two quizzes will automatically be used to calculate the mark (5% each). If only one quiz is written and the other two excused for validated reasons, it will count for 5% of the mark and the other 5% will be transferred to the final exam. If all quizzes are missed for validated reasons, the 10% quiz component will be transferred 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.

Labs and lab reports

Missed sessions or reports must be for an approved reason (permission via the Faculty of Science counselling office). If the lab and corresponding report are missed for a validated reason, the weighting of the other reports will be adjusted so that the lab remains at 20% of the final mark. In the absence of a validated reason, late laboratory reports will be penalized 10% per day. After the reports have been marked and returned (no sooner than 6 days after the submission deadline), no further submission of reports will be permitted and either a mark of zero will be assigned (non-validated reason), or the

weighting of the other lab reports will be adjusted as per above (validated reason for the late report). 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 miss lab report the next time the course is offered.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Note: missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

6. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays.

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.

7. Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

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 e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Permitted aids for tests, quizzes, and the final exam

Students will be permitted to use model kits, a basic calculator, and a periodic table. Any other information that students require will be provided by Dr. Gillies. Students found in possession of prohibited items will receive a mark of ZERO for the entire test or exam.

Use of electronic devices

Only basic scientific calculators are permitted on all tests and exams. All other electronic devices (cell phones, laptops, tablets, cameras, etc.) are prohibited. Students found in possession of prohibited devices will receive a mark of ZERO for the entire test or exam.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, 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 and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (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. You may also wish to contact Accessible Education at

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

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.

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 BSc or BMSc student registered in the Faculty of Science or 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 Counselling 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.