Chem 2223B (Winter 2021−22)
Organic Chemistry of Biological Molecules

Modifications due to COVID-19

Chem 2223B is intended to be an in-person course. Up until Western’s anticipated return to in-person learning on January 31:

- Chem 2223B classes are expected to be held synchronously online through Microsoft Teams during the regularly scheduled times. Resource Room hours will be held online through Zoom.
- Experiment #1, which starts on January 24, will be online and asynchronous. It is currently unknown if Experiment #2 will be online or in-person.

In the event of a COVID-19 resurgence after the return date of January 31 that necessitates the course delivery moving away from face-to-face interaction, the course will pivot to online learning, either synchronously or asynchronously. Details will be provided as needed. The grading scheme will not change. Any remaining assessments will also be conducted online.

The Midterm Test and the Final Exam are in-person assessments. In the event that one or more of these assessments need to be conducted online due to COVID-19, they may be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western’s Remote Proctoring website at: https://remoteproctoring.uwo.ca.

The entire Chem 2223B team is committed to your success in these difficult times and will always keep you informed of any new developments.

Course Description & Prerequisite Requirements

Calendar description: An examination of the chemistry of naturally occurring molecules, emphasizing organic compounds of importance in the Biological and Health Sciences.

Extra information: 3 lecture hours, 1.5 laboratory hours (3 h every other week), 0.5 course.

Prerequisite: Chem 2213A/B or 2283G. Grade 12U Chemistry or equivalent. Antirequisites: None.

Unless you have either the prerequisites for this course or written special permission from your Dean 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.
Course Website

News and course updates will be posted on Western’s learning management system, OWL (http://owl.uwo.ca). This is the primary method by which information will be disseminated to all students in the class, so you are responsible for checking OWL on a frequent basis.

If you need technical assistance with OWL, seek support on the OWL Help page. Alternatively, contact the Western Technology Services Helpdesk by phone at 519-661-3800.

Course Personnel and Email

Throughout the term, two course instructors, a lab coordinator, an undergraduate assistant, a counselling assistant, and several dozen teaching assistants contribute to the course. They are here to support your learning and help you achieve your goals.

<table>
<thead>
<tr>
<th>Instructors and Class Locations/Times</th>
<th>Brian Pagenkopf</th>
<th>NS 145</th>
<th>MWF 8:30–9:20</th>
</tr>
</thead>
<tbody>
<tr>
<td>*course coordinator</td>
<td>Felix Lee*</td>
<td>SSC 2050</td>
<td>MWF 12:30–1:20</td>
</tr>
</tbody>
</table>

Lab Coordinator: Sandra Zakaria Holtslag
Counselling Assistant: Madison Watson

There is one common email for the course: chem2223@uwo.ca

Email should only be used for administrative purposes. Emails are triaged during regular business hours and answered in the order of importance. To allow the Chem 2223B team to respond to administrative concerns as quickly as possible, please do not send emails containing:

- Questions about course material or on how to do a particular problem in the workbook. Such questions should be taken to the Resource Room or posted on the OWL forum.
- Questions that can be answered based on the information found in this course outline.
- Requests for grade increases, extra assignments, make-up labs, or similar.

If you email us, you must use your Western email address and include Chem 2223B in the subject line. Messages from a non-Western account or those that do not include Chem 2223B may be blocked by the university’s anti-spam system. Including your student number would be useful.

Constructive feedback is valuable to us. Please do not hesitate to contact us if you have any comments or feedback on any aspect of Chem 2223B. We are always trying to improve the course so that we can improve your experience!
Course Materials


- Old editions may not be used. Students repeating the course will require a new lab manual. The lab manual must be purchased from the bookstore. Photocopies are not accepted.

No official textbook

- This course does not have an official textbook, but many students will find their Chem 2213A textbook (Organic Chemistry by Klein, 4th edition) to be a useful reference.

Proper lab attire

- This includes an appropriate lab coat, safety glasses, shoes, socks, and pants. Please see the lab manual for further details.

Molecular model kit, by Darling Models

- Other model kits may be used, but we highly recommend this kit for its ease of use.

Class Topics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Approx # of Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colours and Chromophores</td>
<td>3</td>
</tr>
<tr>
<td>Photophysical processes, UV/visible absorption spectroscopy, fluorescence spectroscopy</td>
<td></td>
</tr>
<tr>
<td>Cellular Structure and Function (examinable self-study section)</td>
<td>0</td>
</tr>
<tr>
<td>Brief overview of components, organelles, and function</td>
<td></td>
</tr>
<tr>
<td>Amino Acids and Proteins</td>
<td>8</td>
</tr>
<tr>
<td>Acid-base properties, protein structure, composition and sequence analyses, Edman degradation, laboratory peptide synthesis, enzymes, biosynthesis of proteins</td>
<td></td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>8</td>
</tr>
<tr>
<td>Stereochemistry, reactions of functional groups, properties of di- and polysaccharides, mechanisms of glycolytic reactions, connection between pyruvate and amino acids</td>
<td></td>
</tr>
<tr>
<td>Lipids</td>
<td>9</td>
</tr>
<tr>
<td>Properties, biosynthesis and beta-oxidation of fatty acids, synthesis of soaps and detergents, biosynthesis of terpenes, phospholipids, fat-soluble vitamins</td>
<td></td>
</tr>
<tr>
<td>Nucleic Acids</td>
<td>5</td>
</tr>
<tr>
<td>Structure and properties, DNA sequencing, laboratory DNA synthesis, carcinogens</td>
<td></td>
</tr>
<tr>
<td>Pharmaceutical Drugs</td>
<td>3</td>
</tr>
<tr>
<td>Sources of pharmaceutical drugs, approval process, sulfanilamide, PDT</td>
<td></td>
</tr>
</tbody>
</table>
Laboratory Information and Schedule

For each experiment, watch any provided technique videos that may be on OWL and complete the prelab quiz before the start of your scheduled laboratory session, which is determined by your section of registration. The videos and the prelab quiz will be released at least one week prior to your scheduled laboratory session. The prelab quizzes are worth 20% of each laboratory and cannot be taken until after the prelab videos have been viewed.

In-person labs are located in Chemistry Building 111 and 112. These rooms are on the first floor of the Chemistry Building. Your room will be assigned when you arrive for your first in-person experiment. For in-person experiments, you must attend the section in which you are registered and be in your assigned room. Section changes must be performed on Student Centre prior to the end of the day on January 18.

If Experiment #2 can be in-person, then the following schedule would apply:

<table>
<thead>
<tr>
<th>Experiment</th>
<th>Odd-Numbered Lab Sections</th>
<th>Even-Numbered Lab Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TLC Analysis</td>
<td>Online. Week of January 24.</td>
<td></td>
</tr>
<tr>
<td>2. Amino Acids and Proteins</td>
<td>Week of February 7</td>
<td>Week of February 14</td>
</tr>
<tr>
<td>3. Carbohydrates</td>
<td>Week of February 28</td>
<td>Week of March 7</td>
</tr>
<tr>
<td>4. Fats, Oils, Soaps, and Detergents</td>
<td>Week of March 14</td>
<td>Week of March 21</td>
</tr>
<tr>
<td>5. Synthesis of Zyban</td>
<td>Week of March 28</td>
<td>Week of April 4</td>
</tr>
</tbody>
</table>

If Experiment #2 needs to be online, then the following schedule would apply:

<table>
<thead>
<tr>
<th>Experiment</th>
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<td>5. Synthesis of Zyban</td>
<td>Week of March 21</td>
<td>Week of March 28</td>
</tr>
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</table>

Due to unforeseen circumstances, the schedules above may change.

Please pay attention to any relevant announcements for further instructions related to labs.

For in-person labs, data sheets are to be completed and submitted by the end of your lab session. For online labs, data sheets are to be submitted on Gradescope and are due two weekdays after the start of your scheduled lab session. More information on the prelab quiz, Gradescope, and data sheets will be provided on OWL closer to the start of labs.
**Resource Room**

The Resource Room, located in MSA 1205, provides you with an informal environment for you to ask questions related to lecture material and obtain assistance on practice problems. Group work and peer-to-peer support are strongly encouraged.

During scheduled hours, which will be posted on OWL, the Resource Room will be staffed by a highly qualified teaching assistant.

**Evaluation**

**Components**

Tests and exams are necessary to assess your mastery of core concepts. Your overall course grade out of 100 will automatically be the *higher* of the two grades calculated by the two methods shown below. Listed next to the respective components are their maximum contributions toward the course grade.

<table>
<thead>
<tr>
<th>Component</th>
<th>Notes</th>
<th>Method 1</th>
<th>Method 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory</td>
<td>Five experiments × 3.00 each</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Midterm Test</td>
<td>Date and time to be determined</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Scheduled by the Registrar, 3.00 hours</td>
<td>50</td>
<td>65</td>
</tr>
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</table>

**Requirements for Passing Chem 2223B**

To obtain credit for the course, all four requirements below must be met:

1. Obtain a minimum of 50% on the overall course grade.
2. Obtain a minimum of 40% on the Final Exam.
3. Obtain a minimum of 50% on the laboratory component (7.50 out of 15). This mark is calculated from all five experiments. A missed experiment is assigned a mark of zero unless it has been “excused” (see section on Missed Course Components).
4. Miss no more than two experiments, whether excused or not.

Students who fail to meet requirement #2 or #3 will receive a course grade no greater than 40% (even if the calculated course grade is higher) and will not receive credit for the course.
Academic Policies and Legalities

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 his/her official university address is attended to in a timely manner.

Students who arrive to the lab late, or in inappropriate attire, will be deemed to have missed a lab and will receive a zero for that lab. No credit will be given for the associated prelab exercise.

It is university policy that a regularly scheduled class (lecture, lab, or tutorial) takes precedence over tests and exams. Therefore, if another course schedules a test or exam that takes place during your chemistry lecture or lab, the instructor for that course must accommodate you.

No electronic devices may be in your possession during tests and exams, even for timekeeping purposes. They may not be at your test/exam desk or in your pocket. Any student found in possession of these prohibited devices will receive a mark of zero on the 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 this website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Computer-marked, multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

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/.

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 519-661-2147 if you have questions regarding accommodation.

The university’s policy on Accommodation for Students with Disabilities can be found here: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation%20disabilities.pdf

The university’s policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf
Learning-skills professionals at Learning Development & Success (https://www.uwo.ca/sdc/learning) 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.

Students who are in emotional/mental distress should refer to Health and Wellness (https://www.uwo.ca/health) for a list of options about how to obtain help.

Additional student-run support services are offered by the USC, http://westernusc.ca/your-services.

**Student Absences**

Students who experience an extenuating circumstance (such as illness or injury) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:
  - An absence must be no more than 48 hours
  - The assessment must be worth no more than 30% of the course grade
  - No more than two SRAs may be submitted during the Fall/Winter term
- For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling Office of your home faculty.**

For more information, please consult Western’s policy on academic consideration for absences: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

For the Student Medical Certificate (SMC), please see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

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 (updated annually) at https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.
Missed Labs

There are no make-up labs, and it is not possible to reschedule them. If academic consideration has been granted for the missed lab, the lab will be given a mark of EXCU (excused), which shifts the weight of the missed lab onto all of the other labs. If academic consideration has not been granted, the missed lab will be given a zero.

Tests and exams will contain questions related to the theoretical aspects of the experiments. Students are responsible for the material pertaining to the missed labs.

Missed Midterm Test

If you have received academic consideration for the Midterm Test, the weight of the Midterm Test will be shifted to the Final Exam. There is no make-up for the Midterm Test.

Missed Final Exam

If you are unable to write the Final Exam, contact your faculty’s Academic Counselling Office as soon as possible. They will assess your eligibility to write the Special Exam (the name given by the university to a make-up Final Exam) in May.

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (see https://registrar.uwo.ca/academics/examinations/exam_conflicts.html).

Frequently Asked Questions

Where are the course personnel?

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Felix Lee</th>
<th>MSA 1202</th>
<th><a href="mailto:flee32@uwo.ca">flee32@uwo.ca</a></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brian Pagenkopf</td>
<td>BGS 2020</td>
<td><a href="mailto:bpagenko@uwo.ca">bpagenko@uwo.ca</a></td>
</tr>
<tr>
<td>Lab Coordinator</td>
<td>Sandra Zakaria Holtslag</td>
<td>MSA 1235</td>
<td><a href="mailto:szakaria@uwo.ca">szakaria@uwo.ca</a></td>
</tr>
<tr>
<td>Counselling Assistant</td>
<td>Madison Watson</td>
<td>CHB 119</td>
<td></td>
</tr>
</tbody>
</table>
Can you recommend a tutor?

Before considering a tutor, don’t forget about the free help in the Resource Room!

Private, third-party review or tutor services are not affiliated with, or endorsed by, the university. As such, the university cannot be responsible for any of the content they provide, even if the content causes you to answer exam questions incorrectly. Because of liability reasons, your instructors are not permitted to suggest or recommend any specific tutors.

Students should realize that they may not hire tutors who are Chemistry 2223B teaching assistants, even if they are not from your own lab section. This is a serious legal matter pertaining to conflict of interest. If you are ever in doubt, please do not hesitate to ask your instructor.

Can you increase my grade? Can I do an extra assignment for extra credit?

We are here to help you achieve your goals. We want you to do well in the course. We were, at one time, students ourselves, so we understand the importance of course grades and the hard work that you will invest into this course.

Most importantly, we also have to be fair. The university is committed to academic integrity and has high ethical and moral standards. All students will be treated equally and evaluated using the criteria presented in this course outline and their respective weights. The evaluation criteria are based strictly on actual achievement, not on effort or how hard the student tried. Claims of an excellent academic history, of attendance in the course components, or of personal issues (family, relationship, financial, etc.) cannot be used to justify a higher grade in the course because they are not criteria for evaluation. There is no extra work available for extra credit or to “make up” another grade. We do not offer any extra assignments, essays, experiments, or other work of any kind to any student.

The requirement for a higher grade in order to, for example, maintain a scholarship, enter a program, or obtain a higher GPA for various reasons, is not a justifiable reason for increasing your grade. If we increased or “bumped” your grade (i.e. gave you a grade that you did not legitimately earn), it would be unfair to the other students and also a great disservice to the scholarships and programs who are evaluating all students on the basis of their grades. Please do not ask us for a grade increase.