

Chem 2223b Course Outline (2018–19)

Organic Chemistry of Biological Molecules

Mandatory Notice from the Registrar

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. The prerequisite for this course is Chem 2213a or 2283g. The website of the Office of the Registrar is <http://www.registrar.uwo.ca>.

- Although the prerequisite is only a grade of 50 in Chem 2213a or 2283g, a grade of 60 or higher in either 2213a or 2283g is strongly recommended prior to taking 2223b.

Accessibility

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Student Development Centre

Students are encouraged to make use of the free, study-skills courses and other services, including learning-skills counselling, provided by the Student Development Centre, <http://www.sdc.uwo.ca>.

Mental Health@Western

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Course Website

Students should check OWL (<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 course. The missing of critical information due to failure to check OWL cannot be used as a basis for appeal.

Lecture Sections and Instructors

Lecture Section	Time (MWF)	Room	Instructor	Office	Email
001	8:30 – 9:20	NCB-101	Dr. Len Luyt	ChB 214	lluyt@uwo.ca
002	12:30 – 1:20	HSB-40	Dr. Brian Pagenkopf (course coordinator)	BGS 2020	bpagenko@uwo.ca

Resource Room

The Resource Room, located in MSA 1205, provides an informal environment for you to ask questions related to lecture material. The Resource Room will be staffed at various times by teaching assistants and course instructors. Schedules will be posted on OWL Calendar. We recommend that you use the Resource Room regularly to help build your knowledge base and problem-solving ability.

Email Policies

We are required by law to comply with privacy regulations, so you must use your Western email account (<http://mail.uwo.ca>) whenever you contact us. Email from a non-uwo.ca address will not be responded to; how are we supposed to know who cutiepie1994xoxo@gmail.com is? Any email communication to the instructors must begin with **2223** in the subject line, and the message must contain your **student ID number**.

Email should only be used for administrative purposes. In order to maximize efficiency and to allow your instructors to respond to legitimate concerns as quickly as possible, emails of the following nature will *not* be responded to:

- Questions about course material or on how to do a particular problem. Such questions should be taken to the Resource Room.
- Questions that can be answered based on the information found in this course outline. Being able to find information yourself is an important soft-skill and employability outcome.
- Requests for grade increases, extra assignments, make-up labs, etc.

Please do not hesitate to contact bpagenko@uwo.ca and lluyt@uwo.ca if you have any constructive comments or feedback on any aspect of Chem 2223b. We are always trying to improve the course!

Course Materials

In addition to proper lab attire, the materials below are required and are available at the bookstore.

- *Chemistry 2223b Laboratory Manual, Practice Problems and Sample Tests and Exams* (2019 edition)
 - Old editions may not be used. Students repeating the course will require a new manual. The lab manual also contains information regarding proper lab attire.
 - The lab manual must be purchased from the BookStore; *photocopies are not accepted*.
- The course does not have an official textbook, but many students will find the Chem 2213A textbook (*Introduction to Organic Chemistry*, Brown and Poon, 4th, 5th or 6th edition) to be a useful reference. Students will have access to additional chapters and problems of relevance to Chem 2223B through the Student Companion Site (details will be posted on OWL). The course will be supplemented with material and practice problems that are not found in the textbook.

Outline of Lecture Topics

Topic	Lectures
Colours and Chromophores Photophysical processes, UV/visible absorption spectroscopy, fluorescence spectroscopy	3
Cellular Structure and Function (examinable self-study section) Brief overview of components, organelles, and function	0
Amino Acids and Proteins Acid-base properties, protein structure, composition and sequence analyses, Edman degradation, laboratory peptide synthesis, enzymes, biosynthesis of proteins	9
Carbohydrates Stereochemistry, reactions of functional groups, properties of di- and polysaccharides, mechanisms of glycolytic reactions, connection between pyruvate and amino acids	7
Lipids Properties, biosynthesis and beta-oxidation of fatty acids, synthesis of soaps and detergents, biosynthesis of terpenes, phospholipids, fat-soluble vitamins	8
Nucleic Acids Structure and properties, DNA sequencing, laboratory DNA synthesis, carcinogens	5
Pharmaceutical Drugs Sources of pharmaceutical drugs, approval process, sulfanilamide, PDT	4

Laboratory Schedule

All lab-related enquires should be directed to the Chem 2223b Laboratory Coordinator:

- Sandra Zakaria Holtslag MSA 1235 (next to the year-1 lab) szakaria@uwo.ca

Labs are in rooms 111 and 112 of the Chemistry Building (1st floor). Your room will be assigned when you arrive for your first experiment. You must attend the section in which you are registered and be in your assigned room. Sorry, we cannot accommodate requests to switch rooms. Section changes must be completed prior to the end of the university-designated add/drop period (January 15).

Experiment	Odd-Numbered Lab Sections	Even-Numbered Lab Sections
1. TLC Analysis	Week of January 14	Week of January 21
2. Amino Acids and Proteins	Week of January 28	Week of February 4
3. Carbohydrates	Week of February 11	Week of February 25
4. Fats, Oils, Soaps, and Detergents	Week of March 4	Week of March 11
5. Synthesis of Zyban	Week of March 18	Week of March 25

Learning Outcomes

1. Recognize the importance of organic chemistry in everyday life and the interdisciplinary nature of chemistry.
2. Recognize the relationship of organic chemistry to colour, proteins, sugars, nucleic acids, enzymes and drugs.
3. Think critically about mechanisms, electronic transitions, reactivity and methodology.
4. Learn a variety of experimental techniques and the theory behind them.
5. Use a variety of laboratory equipment and instrumentation.
6. Solve a variety of novel problems in new contexts to unfamiliar substrates or reagents.
7. Draw scientific conclusions from experimental results or data.
8. Safely perform experimental procedures.

Evaluation

Components

The overall course grade, out of 100, will be calculated as listed below. Listed next to the respective components are their maximum contributions toward the course grade.

Component	Notes	Max Value
Midterm Test	Saturday, February 9, 7:00–9:00 pm	35
Final Exam	Scheduled by the Registrar	50
Laboratory	Five experiments (3.00 each)	15

In order to obtain credit for the course, all four of the following requirements must be met:

1. Obtain a minimum of 7.50 out of 15.00 (50%) on the laboratory component. 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).
2. Miss no more than two experiments, whether excused or not.
3. Obtain a minimum *weighted average* of 50% on the midterm test and the final exam. That is, the sum of the midterm test mark out of 35, and the final exam mark out of 50, must be greater than or equal to 42.50 out of 85.00.
4. Obtain a minimum of 50 out of 100 on the overall course grade. Students who meet this requirement, but fail to meet one or more of the above requirements, will receive a course grade no greater than 40 out of 100 (even if the calculated course grade is higher) and will not receive credit for the course.

Important Legalities

It is Department of Chemistry policy that any student repeating a chemistry course must repeat the entire course, including the lab component. There are no lab exemptions.

It is Faculty of Science policy that a student who chooses to write a test or exam is deemed fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress after the fact will not be honoured. There is no opportunity for a reweight of the other course components after the test or exam has been written. *The reason of “I did not want to write a heavily weighted final” is not a valid reason for writing the midterm test while ill.*

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 lab or tutorial, the instructor for that course must accommodate you.

No electronic devices of any kind may be in your possession during tests and exams, even for timekeeping purposes.

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 website: <http://www.uwo.ca/univsec/handbook/appeals/schloff.pdf>. Computer-marked, multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Students who arrive late, or in inappropriate attire, for a lab will receive a zero for that lab; there are no make-up labs, and no credit will be given for the prelab exercises. Plagiarism on the prelab exercise or the data sheets will result in a *minimum* penalty of a mark of zero on that portion of the lab report. More details and additional lab policies are found in the lab manual.

Missed Course Components

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible.

If you are a science student, the Academic Counselling Office of the Faculty of Science is located in WSC 191, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is http://uwo.ca/sci/undergrad/current_students/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (https://studentservices.uwo.ca/secure/medical_document.pdf) when visiting an off-campus medical facility.

For further information, please consult the university's medical illness policy at http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf.

Missed Labs

There are no make-up labs, and it is not possible to reschedule them. If you miss a lab for any reason, you will be assigned a mark of zero for that lab. If the missed lab is due to a reason that is approved by your faculty's Academic Counselling Office, the zero will be replaced by a mark of EXCU (excused), which shifts the weight of the missed lab onto all of the other labs.

You must, within one week of the absence, submit documentation to your faculty's Academic Counselling Office. If they approve your circumstances, ask them to send an email to szakaria@uwo.ca in addition to the instructor and to copy you on the email. The email must contain the date of the missed lab.

Chem 2223b entrusts your faculty's Academic Counselling Office with the task of assessing your circumstances and deciding whether academic accommodation is warranted. Thus, the email from your faculty's Academic Counselling Office must explicitly state that they recommend the granting of academic accommodation. If the email states that the granting of academic accommodation will be left at the discretion of the instructor, it will not be granted. Do not talk to the instructors about your situation.

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 or Final Exam

There is no make-up midterm test. If your faculty's Academic Counselling Office has approved your circumstances, then the value of the midterm test will be shifted to the Final Exam.

If you miss the Final Exam, contact your faculty's Academic Counselling Office as soon as possible. They will assess your eligibility to write the Special Exam (SPC) in May, 2016.

In accordance with guidelines set by the university senate, we will approve an SPC exam if you have a multiple exam situation (see the registrar's definition to determine if you have one here: http://www.registrar.uwo.ca/examinations/exam_schedule.html). However, we will not authorize SPC exams for those with a "heavy exam load" (three exams in four or more periods), nor for those with conflicts. The Registrar will make arrangements for students with conflicting exams.

Equal Opportunity and Evaluation Policy

All individuals involved in the offering of Chem 2223b were, at one time, students themselves. Accordingly, they thoroughly understand the importance of course grades and the hard work that you will invest into this course. They are there to help you achieve your goals in 2223b.

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 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.

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 paperwork in the Faculty of Science's Academic Counselling Office.

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.