

# Chem 3393B: Medicinal Chemistry

## 2022–2023 Course Outline

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### *Course and Instructor Information*

Your Professor for CHEM 3393B is Dr Len Luyt ([lluyt@uwo.ca](mailto:lluyt@uwo.ca)). Dr. Luyt holds appointments at Western University in the Departments of Chemistry, Oncology and Medical Imaging. His laboratory is located in the London Regional Cancer Program at Victoria Hospital.

**CHEM 3393B for winter 2023 is an in-person course that follows lesson plans and learning activities using the OWL class page. Classes are held Monday, Wednesday and Friday, 9:30 to 10:20 AM in MC-105B.** Any changes to the delivery method for CHEM 3393B will be made through an OWL Announcement. Changes to the method for content delivery is at the discretion of the instructor.

**Success in CHEM 3393B requires the student to follow lesson plans and complete learning activities, using the OWL class page, in addition to attending in-person sessions. The course starts Monday January 9, 2023.**

Questions related to course material can be posted on the CHEM 3393B OWL forums. Administrative questions of a general nature may be posted in the 'Administration' folder on CHEM 3393B OWL forums. Resource room hours will be available through CHEM 3393B OWL Zoom or in-person and will be announced in advance. If these approaches to answering your question are unsuccessful, please email the course instructor **from your Western email account** with "CHEM 3393B" in the subject line. Email sent from accounts other than Western will not be responded to.

News and updates will be posted on OWL (<http://owl.uwo.ca>). This is the primary method by which information will be disseminated to everyone in the class. Please remember that it is your responsibility to check OWL on a regular basis.

### *Anticipated Topics*

Medicinal chemistry is a broad topic that spans many disciplines. Since this is a chemistry course, we will focus primarily on the chemical aspects of drugs and less on the biological and clinical aspects. Topics covered will include:

- Drugs and the body (textbook chapters 1-4 and 6-11)
  - What are drugs?
  - What are the common drug targets?
  - How are drugs transported and metabolized?

- Discovery and optimization (textbook chapters 12–18)
  - Generation of lead compounds
  - Optimization of pharmacodynamics and pharmacokinetics
  - Chemical & process development, synthesis methods
  - Computational approaches to drug discovery
- Selected topics (time-permitting; various textbook chapters and supplemental information)
  - Antibiotics (*e.g.*  $\beta$ -lactams, macrolides)
  - Opioids (*e.g.* morphine, heroin, fentanyl)
  - Cholinergic system and chemical weapons
  - The discovery of sorafenib
  - Peptide drugs for diabetes

## Course Materials

The required textbook is *An Introduction to Medicinal Chemistry*, 6<sup>th</sup> edition, by Graham L. Patrick. Copies are available at the Western Bookstore.

It is also possible to rent a digital version for six months for \$41:

[https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2022B&courses%5B0%5D=001\\_UW/CHE3393B](https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2022B&courses%5B0%5D=001_UW/CHE3393B)

The textbook's website, which has a collection of student resources such as additional practice questions, is available without charge at:

<https://global.oup.com/uk/orc/chemistry/patrick6e/>

All course material will be posted to OWL, <http://owl.uwo.ca>. **You are required to follow the course content pages on a weekly basis.**

If students need assistance, 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.

## Learning Outcomes

Broadly speaking, a student receiving credit for the course will be expected to demonstrate competence in their ability to:

- Describe the role of medicinal chemists and chemistry in drug design.
- Explain and apply chemical principles, laws and theories.
- Critically analyze and solve Medicinal Chemistry problems.
- Draw scientific conclusions from experimental results or data.
- Synthesize and evaluate information from various sources.

- Communicate scientific thoughts and ideas in writing.
- Develop time management and organization skills.

## *Evaluation*

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.

<b>Component</b>	<b>Notes</b>	<b>Value</b>
Assignments	Three assignments throughout the course	30
Participation	Attending and participating in discussions during in-class learning sessions and online forums.	10
Test #1	Friday February 10, 2022 starting at 9:30 am	10
Test #2	Friday March 10, 2022 starting at 9:30 am	10
Final Exam	Cumulative. Scheduled by the Registrar.	40

**Assignments** are to be submitted through OWL Gradescope. Marks will be deducted for assignments handed in late, at 10% deducted per day. If not submitted within three days of the deadline, the assignment is considered incomplete and a mark of zero is assigned. In the event of accommodation being provided for a delayed assignment deadline, the latest the assignment can be submitted is one week late. Accommodation that extends beyond one week results in the assignment being “excused” and the marks distributed onto the remaining assignments.

**Participation** marks will be assigned based upon your attendance and participation in learning activities and group discussions during our regular Friday class time. In some instances, discussion topics will be assigned with details provided as part of the course content on OWL and participation will be through contributions to OWL Forums.

**Tests** will be held in-person during regular class times.

**Final Exam** will be held in-person and is scheduled by the Registrar. The final exam covers all material presented in class and material from the assigned learning activities on the OWL class page.

To be fair to everyone in the class, none of the components will be “dropped,” and it is not possible to have the components reweighted unless accommodation is approved.

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

1. Miss no more than one assignment, whether excused or not. In the event of accommodations reducing the number of assessments completed successfully below this minimum, you will be required to complete the items missed the next time the course is offered.

2. Obtain a minimum weighted average of 50% on the combined grade for Test #1, Test #2 and the Final Exam.
3. 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.

## *Prerequisite Requirements*

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 class is either Chem 2283G or Chem 2213A. For those who took Chem 2213A it is helpful if you have taken Chem 2223B, but this is not required.

## *Accommodation and Accessibility*

### **Accommodation Policies**

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:  
[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf)

### **Academic Consideration for Student Absence**

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below. Specific details for course components are provided under the heading “Missed Course Components.”

For work totalling 10% or more of the final course grade, 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://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf)

The Student Medical Certificate is available at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

Students should note that course 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 must be submitted to the Academic Counselling office of a student's Home Faculty.**

For work totalling less than 10% of the overall course grade, for instance missing one in-class learning activity or an online forum posting requirement, please email the instructor within 48 hours of the missed learning activity. There is no need to document the circumstance. If the student misses three or more participation learning activities, then you must provide valid medical or supporting documentation to the

Academic Counselling Office of your Faculty of Registration as soon as possible, in order to receive accommodation.

### **Religious Accommodation**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (see [http://www.registrar.uwo.ca/examinations/exam\\_schedule.html](http://www.registrar.uwo.ca/examinations/exam_schedule.html)).

## *Missed Course Components*

**There are no make-up assignments**, and it is not possible to reschedule them. If you miss an assignment for any reason, you will be assigned a mark of zero for that assignment. If you receive accommodation (through your counseling office) for the missed assignment, an extension may be arranged based upon the length of the accommodation. If the accommodation exceeds one week, then the zero will be replaced by a mark of EXCU (excused), which shifts the weight of the missed assignment onto all of the other assignments.

**There are no make-up tests.** If you receive accommodation for the missed test, then the value of the 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).

## *Academic Policies*

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

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, 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.

Participants in this course are not permitted to record resource room sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

**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](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)

All work submitted for a grade in this course must be your personal work; use of answers obtained externally is prohibited. 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.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

**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.

Completion of this course will require you to have a reliable internet connection and a device that meets the system and technical requirements for OWL, Zoom and Gradescope. Information about the system and technical requirements are available at the following links:

<https://wts.uwo.ca/services/owl.html>

<https://wts.uwo.ca/zoom/index.html>

<https://help.gradescope.com/>

## *Support Services*

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop 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 Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.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.

Students who are in emotional/mental distress should refer to Mental Health@Western ([http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)) for a complete list of options about how to obtain help. Additional student-run support services are offered by the USC, <http://westernusc.ca/services>