ORIGINAL COURSE IMPLEMENTATION DATE: September 2019

REVISED COURSE IMPLEMENTATION DATE:

COURSE TO BE REVIEWED (six years after UEC approval)**:** October 2022

Course outline form version: 10/27/2017

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: CHEM 444

Number of Credits: 3 Course credit policy (105)

Course Full Title: Medicinal Chemistry

Course Short Title:

(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)

Faculty: Faculty of Science

Department (or program if no department): CHEMISTRY

Calendar Description:

Medicinal chemistry involves the search, discovery, optimization, and utility of molecules to treat human disease. An introduction to key biological concepts and pharmacological concepts required to explore medicinal chemistry. Case studies will be included.

Note: Students with credit for CHEM 412D cannot take this course for further credit.

Prerequisites (or NONE):	CHEM 213.
Corequisites (if applicable, or NONE):	NONE
Pre/corequisites (if applicable, or NONE):	CHEM 350 or BIO 320.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number: CHEM 412D

Cross-listed with:

Dual-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar hours	45
Tutorials/workshops	
Supervised laboratory hours	
Experiential (field experience, practicum, internship, etc.)	
Supervised online activities	
Other contact hours:	
Total hours	**45**

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Special Topics

This course is offered with different topics:

☒ No ☐ Yes *(Double-click on box to select it as checked.)*

If yes, different lettered courses may be taken for credit:

☒ No ☐ Yes, repeat(s) ☐ Yes, no limit

(The specific topic will be recorded when offered.)

Transfer Credit

Transfer credit already exists: *(See **bctransferguide.ca**.)*

☒ No ☐ Yes

Submit revised outline for rearticulation:

☐ No ☒ Yes *(If yes, fill in transfer credit form.)*

Grading System

☒ Letter Grades ☐ Credit/No Credit

Expected Frequency of Course Offerings:

Every other year

(Every semester, Fall only, annually, every other Fall, etc.)

Department / Program Head or Director: Dr. Cory Beshara	**Date approved:**	March 9, 2018
Faculty Council approval	**Date approved:**	September 7, 2018
Dean/Associate VP: Dr. Lucy Lee	**Date approved:**	September 7, 2018
Campus-Wide Consultation (CWC)	**Date of posting:**	October 19, 2018
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	October 26, 2018

Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. Describe aspects of chemistry that affect other disciplines (especially biology)
2. Illustrate chemical concepts from earlier courses "in action."
3. Explore various career paths which utilize chemistry.
4. Make connections between molecular structure and medicinal function.
5. Extrapolate simple protein-molecule interaction paradigms such as lock-and-key to more contemporary models such as conformational selection.
6. Explore important biological concepts (eg. DNA → RNA → Protein) with chemistry majors who have little previous exposure.
7. Explore molecular geometry to explore how changing a drug will effect a change in molecular recognition between protein and drug.
8. Relate protein structure/function with disease state and how a particular drug attenuates the effect of a genetic (or acute) condition.
9. Write an in-depth paper in a chemistry discipline.
10. Explain a topic of their choice to an audience utilizing an instructor approved method: ie. presentation; activities, mixture of methods.
11. Make connections between areas of knowledge that could, until now, be categorized and regarded as separate (eg. organic synthesis, molecular interactions, and genetics).

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.)*

Presentation of the course material will be through two 80-minute lectures each week. Lectures will be mixed traditional and flipped so that students can actively explore concepts after a brief introduction. Extensive use of library facilities and available online databases will be required, including access to research journals. Students will be encouraged to explore a drug of their choice within the bounds of the course, which will include aspects such as (but not limited to): drug-drug interactions, drug optimization, lead compound identification, ethical practices in the pharmaceutical industry.

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials *(If more space is required, download Supplemental Texts and Resource Materials form.)*

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Patrick, G. L.	An introduction to Medicinal Chemistry, 6th ed.	☒	Oxford Univ. Press	2017
2.	Williams, D.A.	Foye's Principles of Medicinal Chemistry, 7th ed.	☒	Wolters Kluwer	2012
3.	Silverman, R.B. and M.W. Holladay	The Organic Chemistry of Drug Design and Drug Action	☒	Academic Press	2014
4.	NOTE: additional textbooks are made available through the library and are intended to be supplemental. Students are directed to these texts as needed.		☐		
5.			☐		

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

N/A

Typical Evaluation Methods and Weighting

Final exam:	%	Assignments:	%	Field experience:	%	Portfolio:	%
Midterm exam:	%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests: 4	50%	Term Paper:	35%	Presentation:	15%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

This will depend largely on the topics selected by individual students.
The introduction to the course will include the following topics from the first text book:

(1) Drugs and drug targets: An overview (This includes an overview of weak non-bonding interactions)
(2) Protein structure and function
(3) Receptors: Structure and Function (note, enzymes are covered in another course)
(4) Receptors and signal transduction
(5) (From Foye's) Pharmacology (pharmacokinetics and pharmacodynamics)
(6) Highlight of two drugs within the above framework
(7) Individual student topics (discussed with and approved by professor) using the above framework