

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.)		Special Topics This course is offered with different topics: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Double-click on box to select it as checked.) If yes, different lettered courses may be taken for credit: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit (The specific topic will be recorded when offered.)															
Typical Structure of Instructional Hours <table border="1"> <tr> <td>Lecture/seminar hours</td> <td>45</td> </tr> <tr> <td>Tutorials/workshops</td> <td></td> </tr> <tr> <td>Supervised laboratory hours</td> <td></td> </tr> <tr> <td>Experiential (field experience, practicum, internship, etc.)</td> <td></td> </tr> <tr> <td>Supervised online activities</td> <td></td> </tr> <tr> <td>Other contact hours:</td> <td></td> </tr> <tr> <td>Total hours</td> <td>45</td> </tr> </table>		Lecture/seminar hours	45	Tutorials/workshops		Supervised laboratory hours		Experiential (field experience, practicum, internship, etc.)		Supervised online activities		Other contact hours:		Total hours	45	Transfer Credit Transfer credit already exists: (See bctransferguide.ca) <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Submit revised outline for rearticulation: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (If yes, fill in transfer credit form.)	
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Labs to be scheduled independent of lecture hours: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes		Grading System <input checked="" type="checkbox"/> Letter Grades <input type="checkbox"/> Credit/No Credit															
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															
Expected Frequency of Course Offerings: Every other year (Every semester, Fall only, annually, every other Fall, etc.)																	

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, 6 th ed.	<input checked="" type="checkbox"/>	Oxford Univ. Press	2017
2. Williams, D.A.	Foye's Principles of Medicinal Chemistry, 7 th ed.	<input checked="" type="checkbox"/>	Wolters Kluwer	2012
3. Silverman, R.B. and M.W. Holladay	The Organic Chemistry of Drug Design and Drug Action	<input checked="" type="checkbox"/>	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.	<input type="checkbox"/>		
5.		<input type="checkbox"/>		

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