CHMC71H3 S

Medicinal Chemistry

Winter 2024 Syllabus

## Course Meetings

### CHMC71H3 S

| **Section** | **Day & Time** | **Delivery Mode & Location** |
| --- | --- | --- |
| **LEC01** | Monday, 3:00 PM - 5:00 PM | In Person: IC 320 |

Refer to ACORN for the most up-to-date information about the location of the course meetings.

## Course Contacts

**Course Website:** <https://q.utoronto.ca/courses/332249>

**Instructor:** Prof. Kagan Kerman

**Email:** [kagan.kerman@utoronto.ca](mailto:kagan.kerman@utoronto.ca)

**Phone:** 4162877249

**Office Hours and Location:** Thursdays 3-5 pm in person in EV548 and on Zoom

## Course Overview

The course focuses on the important concepts in the design and synthesis of drugs. The course may include the principles of pharmacology, drug metabolism and toxicology. Strategies for generating valuable active compounds and structure/activity relationships involved in selective transformations of available building blocks into diversely functionalized derivatives will be discussed. The course provides an overview of reactions used at different stages of the drug development process, using representative examples from the literature and case studies of drugs where applicable.

### Course Learning Outcomes

On    successful    completion    of    CHMC71,    students    will    be    able    to:

1. Understand the drug-receptor interactions, and discuss various molecules as ligands to receptors, enzymes and other drug targets.

2. Articulate hits, leads and properties of drug-like molecules, biological drugs and some of the latest    trends in drug discovery.

3. Explore strategies to modify drug properties using rational drug design, and link between chemical    structures and drug properties.

4. Understand the basic concepts of pharmacokinetics, pharmacodynamics and drug toxicity.

4. Understand and engage in medicinal chemistry and drug discovery research

5. Appreciate the multi-disciplinary nature of medicinal chemistry and drug development

**Prerequisites**: CHMC47H3

**Corequisites**: None

**Exclusions:** (CHMD71H3), CHM440H1, CHM444H5

**Recommended Preparation**: BIOC12H3 or CHMB62H3

**Credit Value:** 0.5

## Course Materials

* Golan, Tashjian, Armstrong, and Armstrong, **Principles of Pharmacology: The pathophysiologic basis of drug therapy**, Lippincott, Williams & Wilkins Publisher, (There is now a 4th edition of the textbook, but the 1st edition should be OK!) 2016, ISBN-10 **9781451191004.**

## Marking Scheme

| **Assessment** | **Percent** | **Details** | **Due Date** |
| --- | --- | --- | --- |
| **Mid-term** | 30% | Mid-term will contain short-answer and multiple- choice questions. | 2024-02-26 |
| **Quiz** | 30% | The quiz questions will contain short-answer and multiple-choice questions. The quizzes will take place in the classroom for 10 minutes. | 2024-01-22,2024-01-29,2024-02-05,2024-02-12,2024-03-11,2024-03-18,2024-03-25,2024-04-01 |
| **Final Exam** | 40% | The final exam will contain short-answer and multiple- choice questions. Entire course topics including the quizzes and review game will be included in the exam with more emphasis on the topics covered after the mid-term. | Final Exam Period |

### Late Assessment Submissions Policy

**Missed Mid-term Test and Quiz:** The exact dates of the take-home mid-term test are provided in the Evaluation table. Students who miss the term test and quiz will be assigned a mark of zero for the test unless they can document a compelling reason for missing it. Students in that position must submit a written request to the Course Instructor with appropriate documentation as listed below:

**https://**[**www.utsc.utoronto.ca/physsci/self-declaration-absence-form-0**](http://www.utsc.utoronto.ca/physsci/self-declaration-absence-form-0)

For the **Winter 2024** term, missed term tests and quizzes due to medical illness will require ALL of the following:

1. Completed Student Absence form
2. Self-Declaration on ACORN

All items must be submitted **within three (**3**) business days** of the term test date. If a request is accepted for the mid-term test and quiz, the weighting of the mid-term and quiz will be in an extra-assignment. **There will be no make-up mid-term tests. There will be no make-up quizzes.**

## Course Schedule

|  |  |
| --- | --- |
| **Week** | **Description** |
| **Week 1**  Jan 08 | Introduction to Medicinal Chemistry |
| **Week 2**  Jan 15 | Drug-receptor interactions (part-1) |
| **Week 3**  Jan 22 | Drug-receptor interactions (part-2) **Quiz-1** (2.5%) |
| **Week 4**  Jan 29 | Pharmacodynamics **Quiz-2** (2.5%) |
| **Week 5**  Feb 05 | Pharmacokinetics **Quiz-3** (2.5%) |
| **Week 6**  Feb 12 | Drug metabolism **Quiz-4** (2.5%) |
| **Week 7**  Feb 19 | **Reading Week** |
| **Week 8**  Feb 26 | **Mid-term test in-class** |
| **Week 9**  March 04 | Drug toxicity |
| **Week 10**  March 11 | Introduction to Rational Drug Design (part-1) **Quiz-5** (5%) |
| **Week 11**  March 18 | Introduction to Rational Drug Design (part-2) **Quiz-6** (5%) |
| **Week 12**  March 25 | Introduction to Combinatorial synthesis **Quiz-7** (5%) |
| **Week 13**  Apr 01 | **Review Game & Quiz-8** (5%) |

## Policies & Statements

### Academic Integrity

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.  
  
Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment.  
  
On tests and exams, cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University.

### Equity, Diversity and Inclusion

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.  
  
The University of Toronto is a richly diverse community and as such is committed to providing an environment free of any form of harassment, misconduct, or discrimination. In this course, I seek to foster a civil, respectful, and open-minded climate in which we can all work together to develop a better understanding of key questions and debates through meaningful dialogue. As such, I expect all involved with this course to refrain from actions or behaviours that intimidate, humiliate, or demean persons or groups or that undermine their security or self-esteem based on traits related to race, religion, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, gender identity, gender expression, age, marital status, family status, disability, receipt of public assistance or record of offences.

### University Land Acknowledgement

I wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

### Accommodations

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible.  
  
AccessAbility Services staff (located in Rm AA142, Arts and Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email [ability.utsc@utoronto.ca](mailto:ability.utsc@utoronto.ca). The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

### Use of Generative Artificial Intelligence Tools

Students may use artificial intelligence tools, including generative AI, in this course as learning aids or to help produce assignments. However, students are ultimately accountable for the work they submit.  
  
Students may not use artificial intelligence tools for taking tests, writing research papers, creating computer code, or completing major course assignments. However, these tools may be useful when gathering information from across sources and assimilating it for understanding.  
  
The knowing use of generative artificial intelligence tools, including ChatGPT and other AI writing and coding assistants, for the completion of, or to support the completion of, an examination, term test, assignment, or any other form of academic assessment, may be considered an academic offense in this course.

### Recording of Classroom Material by Students

Recording or photographing any aspect of a university course - lecture, tutorial, seminar, lab, studio, practice session, field trip etc. – without prior approval of all involved and with written approval from the instructor is not permitted.

### Video Recording and Sharing (Download and Re-use Prohibited)

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.  
  
Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor.  
  
For questions about the recording and use of videos in which you appear, please contact your instructor.