

**Fall 2024**

**PHRM 5400, Molecules & Medicine – Principles of Drug Design, 3 credits**

### **Meeting Time and Location**

Tuesdays and Thursdays 11:40 am – 12:55 pm, Living and Learning Commons 315

### **Course faculty**

- Dr. Karen C. Glass (course director), Associate Professor of Pharmacology, Firestone 362, [karen.glass@med.uvm.edu](mailto:karen.glass@med.uvm.edu)
- Dr. Osama Harraz, Assistant Professor of Pharmacology, [osama.harraz@uvm.edu](mailto:osama.harraz@uvm.edu)
- Dr. Wolfgang Dostmann, Professor of Pharmacology, [Wolfgang.Dostmann@uvm.edu](mailto:Wolfgang.Dostmann@uvm.edu)
- Dr. Alan Howe, Professor of Pharmacology, [alan.howe@med.uvm.edu](mailto:alan.howe@med.uvm.edu)
- Dr. Anthony Morielli, Associate Professor of Pharmacology, [anthony.morielli@med.uvm.edu](mailto:anthony.morielli@med.uvm.edu)

### **Office Hours**

By appointment

### **Prerequisites**

Organic Chemistry and Background in Biology or Biochemistry or Permission

### **Course Description**

This 3-credit course conveys the molecular mechanisms by which drugs act in the body and the principles drug design. It highlights the importance of medicinal chemistry as it overlaps with the disciplines of chemistry, biochemistry, microbiology, cell biology, and pharmacology.

Most lectures are split into two parts. Part 1 lasts 40-45 minutes and loosely follows the flow of the textbook. Following a questions/answers break, Part 2 will be more relaxing, and we will take a trip back in time and review an example of the “*Most important drugs in history*”. These are world changing, famous compounds that have had a significant impact on civilization.

### **Format**

All lectures will be in-person in Living and Learning 315. All lecture materials (PowerPoint files, handouts, etc.) will be made available through Brightspace.

### **Required Textbook**

An Introduction to Medicinal Chemistry (7th Ed), Graham L. Patrick, Oxford Press, 2023, or 6<sup>th</sup> edition, 2017. **This textbook is required for the class.** The course is tightly structured along this awesome book, which is not just a great read but also a valuable resource. You will be asked to prepare by reading certain chapter(s) before each lecture.

## Readings

Handouts will be posted before each lecture. The handouts are detailed and usually contain learning objectives, when appropriate background information not in your textbook, web links and, chemical structures to memorize. Most importantly, the handouts contain lots and lots of study questions including detailed answers to the study questions. Working with the study questions will provide an accessible and straight forward metric to master this course with ease.

## Required Platforms and Software

Brightspace, <https://brightspace.uvm.edu/>

iClickers, <https://www.uvm.edu/it/kb/article/iclicker-cloud/>

Join code: <https://join.iclicker.com/XDSF>

- We are using Brightspace as the UVM LIMS. For Brightspace information students can access the following UVM Knowledge Base article:

<https://www.uvm.edu/it/kb/article/brightspace-for-students/>

## Discussion board

Students are encouraged to post and respond to ‘muddiest point’ questions on **concepts** that were unclear from the lecture sessions to the Brightspace discussion boards for each exam. Students have the ability to make anonymous posts.

## Exam Format (80% of grade, 20% each exam)

Throughout the course all students will be required to complete **4 exams**. Exams will be held in person, Living and Learning 315 using paper copies. All exams are essentially cumulative.

All exam questions will be multiple choice, increasing in difficulty from simple recall to applying critical thinking skills. The topics will strictly follow the format from the study questions.

## PowerPoint presentation (15% of grade, Due November 1<sup>st</sup>):

Students taking the course should prepare a PowerPoint presentation on a drug approved by the course director. This drug should be different from any of the major drug classes covered in the lecture material or as a ‘most important drug in history’.

- The presentation must be on a drug approved by me (submit your choice by email).
- PowerPoint: 10-15 slides, 10-15 min presentation recorded through Zoom, PowerPoint, or other platforms.
- The presentation should include the drug’s discovery, structure, chemical properties, synthesis, SAR, biological effects, and historical significance.
- The structure of the drug is required.
- Figures are welcome, and remember to cite them appropriately.
- References at the end.
- This presentation will be submitted and posted in Brightspace and will be required viewing for all other students online.
- The presenting student is expected to create 1-2 discussion-based questions from the materials (by Nov 1<sup>st</sup>) and lead an online discussion on the topic.

- The student presentation will be graded 1-10 points on the thoroughness and quality of their presentation, as well as discussion board questions posted.

**Discussion of Presentations (5% of grade, Due by Dec 2<sup>nd</sup>)**

All students in the class will be graded (pass/fail) on their participation in the discussion board, either by answering or asking questions about specific student presentations.

The lowest scoring grade in the course will be dropped to calculate the final grade based on the average of 4 exams, or 3 exams and the PowerPoint presentation/discussion board activity, whichever results in the highest overall grade.

**Numerical and letter grades**

Undergraduate		
98	A+	Excellent
95	A	Excellent
92	A-	Excellent
88	B+	Good
85	B	Good
82	B-	Good
78	C+	Fair
75	C	Fair
72	C-	Fair
68	D+	Poor
65	D	Poor
62	D-	Poor

**Religious Holidays**

Students have the right to practice the religion of their choice. Each semester, students should submit in writing to the instructor(s), as early as possible and at least one week before their documented religious holiday, the date(s) of the conflict or absence. The faculty will work with any students who miss work or exams for religious observance to make up this work.