Chemistry 130A: Pharmaceutical Chemistry: DRAFT

Lectures:
2:00 - 5:00 pm Thursday
9:00 am - 12:00 pm Saturday
Location: TIGP 207

Instructor of Record:

Professor Jacquelyn Gervay-Hague -- jgervayhague@ucdavis.edu
Office Hours: Friday 4-5 Room 204 TIGP or by appointment

TA:

TBD
TA Office Hours: TBD

Course Description:

This class will provide an introduction to the chemical principles behind the design and production of pharmaceutical agents. Focus will be on explaining and predicting how small organic molecules bind to biological receptors, inhibit enzymes and get metabolized. This course will draw on and expand upon material covered in introductory organic chemistry such as proposing reasonable arrow-pushing mechanisms for organic reactions and predicting the reactivity of organic molecules with particular reagents.

Textbook

"The Organic Chemistry of Drug Design and Drug Action, 3rd Edition"
Richard B. Silverman and Mark W. Holladay
Chemistry 130A will cover parts of Chapters 1 through 6.

Course Guideline

Course evaluations will be based on the following:

In Class Quizzes (5)	75%
Final Exam (in Class April 27th)	25%

Policies

-make ups: ***There will be no early or late quizzes/exams***

-final exam: One must take the final exam in order to pass this class. Students who miss the final exam will receive a grade of "incomplete" only if written documentation for a legitimate reason for their absence is provided and they have a passing grade going into the final exam.

-regrades: Legitimate questions about the grading of an exam/quiz (either the grading of a particular problem or an addition error in the score) can be submitted up to one week after the exam/quiz is handed back. The procedure for submitting an exam/quiz for regrade is to attach a separate piece of paper to the front of the exam/quiz with your name, the question to be regraded and a brief justification for the regrade. Do not write on the exam/quiz itself or the exam may not be accepted for a regrade. **The entire exam will be regraded** when it is submitted for a regrade, not just the problem in question.

Strategies for Success

It is recommended that students attend all lectures and take detailed notes, which should become a primary study source. Also, complete and understand all the assigned problems. Don't wait to start studying. Reread notes and work problems after every lecture. Last minute cramming rarely works in any organic chemistry class. Exam/quiz material will almost entirely come from the class notes and assigned problems. Group study is encouraged. The group can compare class notes and help each other understand the material.

Outline of Lecture Topics

April 9: *Lecture 1: The Story of Aspirin*

Concepts to be covered - Basic Organic Chemistry Principles

Natural products

Drug Discovery

Clinical Trials

Enzyme structure

Lead compounds

Pharmacophore

Lead modification

Prodrug

Bioavailability and biodistribution

Rule of five

Apri 16: Quiz 1 will test material from lecture 1 and assigned problems

Lecture 2: The Story of Cis-Platin

Concepts to be covered - DNA as a target

SAR

Types of drug receptor interactions

Mechanism of Action

Selective targeting

April 18: Quiz 2 will test material from lecture 2 and assigned problems

Lecture 3: The Story of Tamiflu

Concepts to be covered - Viral protein targets

SAR to achieve Enzyme inhibition

Competitive inhibition

Small molecule prophylactic

Drug/protein interactions

April 23: Quiz 3 will test material from lectures 3 and assigned problems

Lecture 4: The story of HIV

Concepts to be covered - Viral replication

Structure of RNA

Mechanism of Action

April 25: Quiz 4 will test material from lecture 4 and assigned problems

Lecture 5: The story of Penicillin

Concepts to be covered - Bacterial replication

Resistance

Compliance

April 30: Quiz 5 will test material from lecture 5 and assigned problems

Lecture 6: A Big picture view of Pharmaceutical Science

Concepts to be covered - Biologics

Vaccines

Nutrition and Health

Final Exam in class – May 2, 2020

one must take the exam in order to pass the course.

No make-up exams given.