

Medicinal Chemistry

CH 490 – 3 credit hours

Course Instructor: David C. Forbes (chemistry)

University of South Alabama

University Honors Program

Robert Coleman, Director

Course Description: The Special Topics Honors Seminar in Medicinal Chemistry will explore the role of organic chemistry in the design and action of drugs. Concepts presented in the two-semester organic chemistry sequence will be applied in discussing principles of drug discovery, drug development, drug/receptor interactions and structure/activity relationships. Aspects of biochemistry and physical organic chemistry will be covered as necessary to understand the chemistry of drug action and metabolism in the body. Examples from the major classes of drugs will be used to facilitate discussion and examine the role of medicinal chemistry as witnessed today.

Texts

Foye, William, Lemke, Thomas, and Williams, David. *Principles of Medicinal Chemistry*. Philadelphia: Lippincott Williams & Wilkins, 1995.

Syllabus

Date	Topic
Week 1	<i>Introduction to Medicinal Chemistry</i> (Chapters 1 & 2)
Week 2	<i>Biopharmaceutical Properties of Drug Substances</i> (Chapter 3)
Week 3	<i>Pharmacologic Activity</i> (Chapter 4)
Week 4	<i>Drug Design</i> (Chapters 5 & 6)
Week 5	<i>Drug/Receptor Interactions</i> (Chapter 7)
Week 6	<i>Drug Resistance and Metabolism</i> (Chapter 8)
Week 7	<i>Metal-Based Drugs</i> – Guest Lecture by Prof. James Davis (Department of Chemistry)
Week 8	<i>Computer Aided Drug Design</i> – Guest Lecture by Prof. Andrzej Wierzbicki (Dept. of Chemistry)
Week 9	<i>Student Presentations (Groups A and C) and Discussions (Lead Discussion Group, Groups F and B)</i>
Week 10	<i>Student Presentations (Groups B and D) and Discussions (Lead Discussion Group, Groups E and A)</i>
Week 11	<i>Student Presentations (Groups C and E) and Discussions (Lead Discussion Group, Groups D and F)</i>
Week 12	<i>Student Presentations (Groups D and F) and Discussions (Lead Discussion Group, Groups C and E)</i>
Week 13	<i>Student Presentations (Groups E and A) and Discussions (Lead Discussion Group, Groups B and D)</i>
Week 14	<i>Student Presentations (Groups F and B) and Discussions (Lead Discussion Group, Groups A and C)</i>

Grading:

The goals of this course are to understand the relationships between the biological, chemical and physical properties of medicinal compounds. This program will rely heavily upon the participation of all individuals. Accordingly, the course is structured so that all participants will present, discuss and critique a host of topics within the realm of medicinal chemistry. Group discussions will develop both written and verbal communication skills. Written critiques will assist in developing the skills of critical analysis. The instructor's role will be to introduce the concepts of

medicinal chemistry and serve as a general moderator. The course will attempt to probe, communicate and critically evaluate issues of high medicinal relevance through a peer-reviewed format.

The final grade will be based upon the following grading scheme:

Class Participation 10% 100 pts
Presentations (2) 60% 2 x 30% 600 pts
Lead Discussions (2) 10% 2 x 5% 100 pts
Written Critiques (10) 20% 10 x 2% 200 pts
TOTAL 100% 1000 pts

The course grade will be based upon your performance in class and consist of the accumulated total points that you have achieved. The final grade will be determined in the following manner: A - 100-90%; B - 89-80%; C - 79-70%; D - 69 - 60%; F 59% and below. In special circumstances minor revisions to lower cutoffs may be made. In the event an error has been made during the grading of any scheduled assignment, you must report the error within two weeks of the scheduled assignment. No changes will be made after this time.

Topics to be presented must be approved by the instructor. Topic selection will be based upon a first-come-first-serve basis. Duplication of topics will not be permitted. Groups will be assigned within the first week of classes. Groups will consist of 2-4 students and be based upon the course enrollment. Presentations must be in Power Point and available to the class one week prior to the presentation date. (NOTE: All due dates refer to when we meet as a group as described by the Schedule of Classes.) Use of the board, overhead and handouts, as aids, will be permitted. Lead discussion groups must have all relevant materials two weeks prior to the presentation date. Written critiques will be due one week after the presentation date.

A. Presentations are to be formal and professional. Plan on a thirty (30) minute presentation (30-50 slides) of the topic your group has selected. All group members must contribute in both the preparation and actual presentation of the topic selected. It is important to understand that a complete presentation of the topic must be done, that is, groups must provide sufficient background, significance and importance, historical relevance, lead compounds discovered, source of commercial compounds currently on the market and to comment on where the topic stands today. Each group will present two topics.

B. Lead Discussions are to be led by the designated discussion group. All those enrolled are required to participate; however, to maintain continuity throughout the presentation, we will have designated discussion groups. The purpose of a discussion group is to stimulate and direct the class discussion of the topic selected. Each discussion group will have all cited material two weeks prior to the presentation date and thus acquire knowledge of the topic selection prior to the presentation date.

Written Critiques are to be typed and no longer than one page. All those enrolled, aside from those presenting, are to complete a written critique on each presentation. Thus, a total of ten (10) critiques are to be completed. The purpose of the written critiques is to critically review both the materials presented and the primary literature cited. Critiques from designated discussion groups will be unique due to the format of the course. That is, discussion groups will have acquired an increased level of knowledge prior to the presentation and thus their critiques should be more detailed. The critiques should evaluate issues of clarity, organization and level of understanding. The reviews will not be antagonistic but constructive. Written critiques will be duplicated and furnished to those presenting.