Master Course Syllabus Outline

Department: Chemistry, Geosciences, and Environmental Science

Official Course Title: Medicinal Chemistry, CHEM 4453

Master Syllabus Approved by Department on: _____/_____/_____

month date year

I. Course Description

An examination of the principles of drug action including receptor-effector theories and the effects of physico-chemical properties on biological activity. The principles of drug design, synthesis, and metabolism will be presented.

II. Prerequisites

CHEM 2024 and BIOL 1214

III. Expanded Course Description

Chemistry 4453 is a study of drug design and drug action from an organic chemistry viewpoint. It briefly covers the history of medicinal compounds. It then looks at drug discovery, lead compounds, lead modification, the Hansch Equation and other linear free energy relationships. Receptors are then examined with regard to drug-receptor interactions. Enzymes and enzyme inhibitors are studied, taking particular note of the organic chemical mechanisms of drug action. DNA drugs are discussed and drug metabolism is covered briefly. Finally prodrugs and drug delivery systems are mentioned. The students also research a medicinal chemistry topic and give a report to the class on their research.

IV. Intended Student Learning Outcomes

Knowledge Outcomes

The student who successfully completes this course will be able to
A. understand and explain drug design, receptor interactions, and dose-response behavior
B. understand and explain drug interactions, drug resistance, and drug synergism
C. understand and relate DNA interactions and mechanisms
D. understand and explain drug metabolism and drug delivery
E. explain the differences and similarities of different classes of drugs
F. know common definitions used in medicinal chemistry.

**Skill Outcomes**

The student who successfully completes this course will be able to
A. write reasonable mechanisms of action for drugs
B. write good explanations of drug design and drug action
C. draw dose-response curves for different types of interactions.
D. use the chemical literature and speak knowledgably about a researched topic.

**Value Outcomes**

The student who successfully completes this course will
A. gain an appreciation for the science involved in medicinal chemistry
B. appreciate the difficulty of getting drugs refined and approved

V. Unless otherwise stipulated in this master syllabus by the department, the following items are subject to faculty discretion as described in each faculty member's individual course outline/ syllabus.

a) **Course Requirements**

   Students are expected to attend all classes and complete all work. Students are expected to do the readings, email questions, and keep up with the material even if there are problems with technology in delivery. Students with special requirements or circumstances should contact the instructor or the Director of Disability Services in the Academic Affairs Office.

   Grading is based on the averages of two or three exams, a research report, and a comprehensive final exam. Students taking this course for graduate credit will do two reports and submit a typed paper with each report.

b) **Required Textbook and Materials**


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Signature    month     date      year