

# Bemidji State University

## CHEM 4614: Medicinal Chemistry: Drug Design

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course focuses on drug design and development, as well as the absorption, distribution, metabolism and excretion of drug molecules. Organic chemistry principles vital to drug synthesis and case studies of clinically relevant drugs will be incorporated. Prerequisite(s): CHEM 3312.

**B. COURSE EFFECTIVE DATES:** 08/27/2018 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Aspects in pharmaceutical synthesis
2. Clinical trials
3. Drug discovery (identifying and optimizing lead compounds)
4. FDA approval process
5. Pharmacokinetics (drug absorption, distribution, metabolism, and elimination)
6. Properties of functional groups
7. Structure activity relationships

### D. LEARNING OUTCOMES (General)

1. explain the process of getting a drug to market including the patent process to protect intellectual property and clinical trials.
2. discuss the importance of hydrophobic/hydrophilic properties of drugs, predict these properties based on their structure and propose structural changes to alter these properties.
3. describe how drug absorption, distribution within the body, metabolism, and excretion relate to the chemical structure of drug molecules and provide examples of how drugs are designed to optimize these pharmacokinetic parameters.
4. summarize the steps of drug discovery including identifying a lead compound and selecting an appropriate assay to measure biological activity.
5. construct modified drugs to optimize interactions with the target and to promote favorable pharmacokinetics (for example, more or less easily absorbed, more or less resistant to metabolism and the use of prodrugs).

### E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted