

## Biochemistry of Medicinals I (6151) Fall Semester 2007

**TC Course Faculty:** Prof. David M. Ferguson, Ph.D. (TC Course Director)  
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**UMD Course Faculty:** Prof. Elizabeth Amin, Ph.D.  
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**Teaching Assistants:** TBA

**Lecture Hall:** TBA

**Objectives:** This course is designed to provide students with a strong foundation in the structure and function of medicinals which is a prerequisite for advanced studies in pharmacy. The basic goals are to familiarize the students to the structural and physical properties of proteins, nucleic acids, and carbohydrates, as well as ligands/drugs that bind to these macromolecules in an effort to understand the functional role each plays in the biochemistry of medicinals. A particular emphasis is placed on the basic concepts that are central to structure-function relationships of therapeutics.

**Course Structure:** Instruction is lecture-based with use of the textbook as support for class notes and discussions. Problem sets will also be assigned as a study guide to the course. Five non-cumulative exams will be given during the semester, with the last exam falling on the day assigned by the University for the final examination. Exams are one hour in length and are graded on a percentage basis. Make-up exams will be given during finals week and will only be given to students that have missed the regular exam due to a verifiable medical emergency approved by the course faculty and the Office of Student Services. **Vacations or other personal matters of choice will not be accepted as an excused absence.** Each exam will be weighted equally and averaged to determine the final letter grade. In some cases, a curve may be used align the grade accordingly.

Letter grades are assigned in accord with University policy as follows:

A	>92.5	A-	=88.5-92.4
B+	=84.5-88.4	B	=80.5-84.4
B-	=77.5-80.4	C+	=74.5-77.4
C	=70.5-74.4	C-	=67.5-70.4
D+	=63.5-67.4	D	=59.5-63.4
F	<59.5		

**Regrade Policy:** Exams must be returned to the faculty member within 3 days (after the exam is received by the student). The student must explain *in-writing* the grading error and justify their request for a change in the points awarded on the exam.

**Honor Code:** Each student is bound by the following specific provisions as part of the honor code: Academic misconduct is an unauthorized act which may give a student an unfair advantage over other students, including but not limited to falsification, plagiarism, misuse of test materials, receiving or giving unauthorized assistance. Each student will be asked to sign a cover sheet on tests, quizzes, and major assignments that reaffirms the honor code as it applies to this course.

**Disability Accommodation:** Any student with a demonstrated disability who needs to arrange reasonable accommodations must contact the course director as well as the Office of Student Services and Disability Services (626-1333). All discussions will be held confidential.

**Required Text:** Stryer, Biochemistry, 4th edition or higher, Freeman and Co., NY.

## Course Outline

### Week 1 (Ferguson)

Introduction

Basics of Molecular Structure

Amino Acids

Structure/Function/Clinical Correlations

Acid-Base Chemistry

### Week 2 (Ferguson)

Proteins

Structures

Characterization

Myoglobin, Hemoglobin

O<sub>2</sub> Storage and Transport

### Week 3 (Ferguson)

Conclude Proteins

**EXAM** on Proteins

Enzymes

Introduction

Kinetics

### Week 4 (Ferguson)

Kinetics

Enzymes

Inhibition

Allosteric Models

### Week 5 (Ferguson)

Lysozyme

Chymotrypsin

HIV Protease

### Week 6 (Ferguson)

Enzymes

Drug Design

**EXAM** on Enzymes

### Week 7 (Ferguson)

Carbohydrates

Structure

Stereochemistry

Nomenclature

### Week 8 (Ferguson)

Lipids

Structure

Function in Transport

**EXAM** on Lipids and Carbohydrates

### Week 9 (Tretyakova)

Nucleic Acids

Introduction

Bases

Double Helix

### Week 10 (Tretyakova)

RNA

MRNA, tRNA

Deciphering the Genetic Code

### Week 11 (Tretyakova)

**EXAM** on Nucleic Acids

DNA Replication

Gene Rearrangements

### Week 12 (Amin)

RNA Synthesis and Splicing

Mechanism of Transcription

Post-transcriptional Processing

### Week 13 (Amin)

Translation

Genetic Code

RNA

### Week 14 (Amin)

Ribosome

Mechanism

Protein Synthesis

**EXAM** during Finals Week