

**SOUTHERN CONNECTICUT STATE UNIVERSITY**

CHE 450 Biochemistry I

Fall Semester, 2005

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Office Hours:  
Tues.: 10:00 – 12:00  
Mon., Wed., Fri.: 11:00 – 12:00

Course number: CHE 450

Credit Hour: 4

Prerequisite(s): CHE 260-261

Course Title: Biochemistry I

**COURSE DESCRIPTION:**

Biochemistry is a physical science that applied to biological problems. Biochemistry involves the study of structure and function of molecules that make up living cells and organisms. Understanding the structural properties of a molecule enables us to form hypotheses about its interaction with other molecules and its function in a cell. In CHE 450-451, we will discuss the molecular aspects of the four major types of biological molecules: proteins, nucleic acids, lipids and carbohydrates. Further topics include biological equilibria, metabolic pathways, thermodynamics, kinetics, bioenergetics, and the assembly of molecules into cellular structures such as membranes and organelles.

**COURSE CONTRIBUTION:**

CHE 450 is a required course for American Chemical Society (ACS) certification.

CHE 450-451 is required for chemistry majors whose degree is in Biochemistry Concentration.

CHE 450-451 contributes as electives for those students who pursue chemistry with secondary education certification.

**LEARNER OUTCOMES & ASSESSMENTS:**

1. Students will have a solid comprehension of the structures and functions of biological molecules, especially carbohydrates and proteins, the metabolism of cells and organisms, and principles of bioenergetics. Students will be able to correlate biochemical knowledge with human health and disease and their everyday activities and choices. (INTASC 1, 4, 5, 6, 8, 10; NSTA 1, 2, 3, 4, 5, 6, 7, 8; CCCT 1.3, 1.4, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.4, 3.6.)
2. Students will be able to understand, absorb and critically analyze the new knowledge generated by research. (INTASC 9; NSTA 4, 7, 10; CCCT 3.4.)

**MODES OF LEARNING:**

The modes of learning include:

- Lectures by faculty
- Class discussion
- Multimedia presentation
- Case analysis and student presentation
- Problem based learning

**COURSE OUTLINE**

<u>Date</u>	<u>Topic</u>
August 29	Ch.1: Introduction to the Chemistry of Life
August 31	Ch. 2: Water: Physical Properties
September 2, 7, 9 & 12	Ch. 2: Water: Chemical Properties, Acid-base Chemistry and Buffer
September 14, 16 & 19	Chapter 4: Amino Acids
September 21 & 23	Chapter 5: Proteins: Primary Structure
September 26, 28 & 30	Chapter 6: Proteins: Three-Dimensional Structure
October 3 & 5	Chapter 7: Protein Function: Hemoglobin and Myoglobin

October 7	Ch. 11 Enzymatic Catalysis
October 14	Mid-term Exam
October 10, 12 & 17	Chapter 12: Enzyme Kinetics, Inhibition, and Regulation
October 19 & 21	Chapter 8: Carbohydrates
October 24, 26, 28 & 31	Chapter 13: Introduction to Metabolism: Thermodynamics and Bioenergetics
November 2, 4 & 7	Chapter 14: Glucose Catabolism: Glycolysis
November 9 & 11	Chapter 16: Citric Acid Cycle
November 14 & 16	Chapter 17: Electron Transport and Oxidative Phosphorylation
November 18, 21, 28 & 30	Chapter 15: Glycogen Metabolism, Gluconeogenesis, and Hormonal Signal Transduction
December 2 & 5	Chapter 15, cont'd
December 7	Review
December 13	Final Exam

### **REQUIRED TEXT(S)**

#### **Text:**

- *Fundamentals of Biochemistry*, 2<sup>nd</sup>. edition by Voet, Voet & Pratt, John Wiley & Sons, Inc. (2005)
- *Student Companion to accompany Fundamentals of Biochemistry*, by Voet, etc., John Wiley & Sons, Inc. (2000)

#### **Class URL:**

- Section 1: <http://edugen.wiley.com/edugen/class/cls14141>
- Section 3: <http://edugen.wiley.com/edugen/class/cls14144>

### **COURSE REQUIREMENTS:**

Students are required to take all the tests, actively participate in class discussion, conduct all the lab experiments and finish the required lab reports.

#### **Illness and Absences:**

If you are absolutely unable to attend an examination due to illness or other crisis, please leave a message on my voice mail at 392-6272 or in the Departmental Office at 392-6260. If you wish to take a make-up examination, you must provide me with a medical excuse or other proof of illness. The doctor's note must include a diagnosis or statement that you were incapable of taking the examination.

#### **Laboratory:**

The Chemistry Department requires that everyone wear Safety Glasses while in the laboratory, beginning with the first laboratory. If you show up for any laboratory period without Safety Glasses, you will NOT be allowed to perform the experiment and you will receive a zero grade for that experiment. The proper Safety Glasses must meet OSHA regulations and can be purchased at the Southern Connecticut State University Bookstore.

### **EVALUATION CRITERIA:**

Mid-term Exam	25%
Homework Assignment egrade	25%
Laboratory grade	25%
Final examination	25%
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	100%

The final grade will be determined by the percentage of points obtained. The actual grade will be based on the Southern Connecticut State University grading scale with possible adjustment for class average at the end of the semester (if necessary).

Please remember that it is the policy of the Chemistry Department at Southern Connecticut State University that, to receive a passing grade in CHE 450, you **MUST pass the laboratory portion of the course**. A passing grade for the laboratory portion of the course is a 60%.