

University of Arkansas – Fort Smith  
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## General Syllabus

### CHEM 3403 Biochemistry I

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisites: CHEM 2713 Organic Chemistry II and BIOL 2003 Introduction to Cell Biology

Effective: 2018~2019

#### I. Course Information

##### A. Catalog Description

Structure and function of important classes of biomolecules and the relationships of structure to function are explored. An introduction to enzyme kinetics, biochemical thermodynamics, and biochemical solution relationships are included.

##### B. Additional Information

The first in a two course sequence that covers the principles of biochemistry. This course is designed for majors in chemistry, biology, pre-medicine, pre-veterinary, pre-dental, and associated science majors. It would also be applicable for majors such as biophysics, bioengineering, and certain areas of chemical engineering.

#### II. Student Learning Outcomes

##### A. Subject Matter

Upon completion of this course, the student will be able to:

1. Identify, describe and compare major classes of biological molecules.
2. Discuss and compare the basic chemistry of macromolecules and subunits.
3. Relate the three-dimensional nature of biomolecules and the associated biochemical activities.
4. Apply basic thermodynamic concepts including free energy to biochemical reactions.
5. Apply chemical principles of structure and function to biochemical molecules.
6. Analyze and discuss the structure and function of enzymes as biochemical catalysts.

##### B. University Learning Outcomes

Biochemistry I enhances student abilities in the following areas:

### **Analytical Skills**

**Critical Thinking Skills:** Students will identify a problem or issue and will research, evaluate, and compare information from varying sources in order to evaluate authority, accuracy, recency, and bias relevant to the problems/issues. Students will generate solutions/analysis of problems/issues evaluated and will assess and justify the solutions and/or analysis.

### **Communication Skills (written and oral)**

Students will communicate proficiently. Students will compose coherent documents appropriate to the intended audience and effectively communicate orally in a public setting.

### **Ethical Decision Making**

Students will model ethical decision-making processes. Students will identify ethical dilemmas and affected parties and will apply ethical frameworks to resolve a variety of ethical dilemmas.

### **Global & Cultural Perspectives**

Students will reflect upon cultural differences and their implications for interacting with people from cultures other than their own. Students will demonstrate understanding or application of their discipline in a global environment and will demonstrate how their discipline impacts or is impacted by different cultures.

## **III. Major Course Topics**

- A. Major Groups of Biomolecules
- B. Structure and Properties of Biomolecules
- C. Reactions and Interactions of Biomolecules
- D. Energetics of Interactions of Biomolecules