

University of Arkansas - Fort Smith
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General Syllabus

CHEM 42061 – Biophysical Chemistry Laboratory

Credit Hours: 1

Lecture Hours: 0

Laboratory Hours: 3

Prerequisites: CHEM 31663 Organic Chemistry I and PHYS 20203 College Physics II or PHYS 20403 University Physics II

Prerequisite or corequisite: CHEM 42063 – Biophysical Chemistry

Effective Catalog: 2026-2027

I. Course Information

A. Catalog Description

Laboratory course designed to explore traditional physical chemistry subject matter from a biochemistry perspective. Topics will include thermodynamics, chemical and enzyme kinetics, solutions of macromolecules, chemical equilibria, macromolecular modeling, and bioenergetics.

B. Additional Information

This course is primarily designed for students of biochemistry, but is also intended for students in physics, biology, and engineering. sequence that covers the principles of biochemistry.

II. Student Learning Outcomes

A. Subject Matter

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

1. Design experiments to apply theories of thermodynamics to biomolecules.
2. Generate, analyze, and interpret thermodynamic data associated with experimentally observed biochemical processes.
3. Measure, analyze and interpret kinetics data associated with biochemical processes, including enzyme and ligand binding processes.
4. Design structure-to-function experiments using biochemical molecules.
5. Quantify the structure and function of enzymes as biochemical catalysts.
6. Discuss and critique the theory behind common biochemical techniques.
7. Follow appropriate safety protocols associated with general and specific lab techniques used.

B. University Learning Outcomes

Biophysical Chemistry Laboratory enhances student abilities in the following areas:

Analytical Skills

Quantitative Reasoning: Students will generate laboratory data and use numbers, read and analyze data, create models, draw inferences, and support conclusions based on sound mathematical and scientific reasoning.

Communication Skills (written and oral)

Students will communicate proficiently. Students will compose coherent lab reports as either entries into laboratory notebook or in the form of written lab reports for submission.

Ethical Decision Making

Students will model ethical decision-making processes. Students will identify ethical dilemmas and affected parties and will apply ethical frameworks towards resolution of such dilemmas.

Global and Cultural Perspectives

Students will reflect upon cultural differences and their implications for interacting with people from cultures other than their own.

III. Major Course Topics

- A. Laboratory Techniques and Record Keeping
- B. Interpretation of Laboratory Data
- C. Theory and Application of Biochemical Techniques
- D. Biochemical Laboratory Procedures