Biochemistry I
Integrated Lecture and Laboratory
CHM 421/BIO 421 Fall 2004

Dr. Lynn M. O’Brien
Office: Smyth 304C
Office Hours: TTH 8:00-9:00, T 1:30-2:15
and by appointment

Phone: 389-2583
E-mail: lxobrien@naz.edu

Course Description

Biochemistry is the study of the molecular basis of biological processes in living organisms. It seeks to explain how a collection of inanimate molecules such as carbon, hydrogen, oxygen, and nitrogen interact to build the biomolecules necessary for development, maintenance, and reproduction of organisms as diverse as E. coli and human beings. Biochemistry is a growing discipline that provides insight into the related fields of genetics, immunology, microbiology, cell biology, and physiology. We will explore how advances in our understanding of the chemical reactions and molecular interactions which govern living organisms have made important contributions to the fields of medicine, agriculture, nutrition, and even our criminal justice system. The exponential rate at which our biochemical knowledge is expanding ensures that biochemistry will have a profound influence on the quality of our lives into the next century.

Required Texts and Supplies:
Exploring Biochemistry Lab Manual (Available on Blackboard)
Hardbound notebook to record experimental data
Safety glasses

Assignments:
Reading assignments should be completed prior to the scheduled lecture. Due to the nature of the discipline, a large amount of material will be covered in this course. It is important that you review your lecture notes and read the chapter material in a timely fashion. Students who wait until the last minute to study will be quickly overwhelmed with the volume of material. Throughout the course of the semester, I will distribute problem sets that emphasize important concepts we have covered in lecture. Journal articles addressing relevant topics will be assigned periodically and provide the basis for class discussion. You are expected to come to class prepared to participate in this discussion!
Laboratory: We will be integrating the laboratory and lecture portions of this course throughout the semester. This experience will provide an opportunity for inquiry-based, experiential learning and allow exposure to a variety of techniques currently used in the field of biochemistry. Written laboratory reports will include four summary, one formal lab report, and one research report. The following reference texts can be found in the Chemistry Library or borrowed from the instructor:


**Summary Lab Reports:** Summary lab reports will be written for experiments I, II, III, V, and VI. They should include the following information:

- **Title**
- Data organized in graphs and tables with appropriate figure legends
- **Conclusions**
- Answers to any questions given in the lab manual

Summary lab reports are due one week following completion of the lab.

**Research Paper:** Following experiment IV, Molecular Modeling, students will select a protein whose structure and function they would like to explore using the molecular modeling program, Protein Explorer. Information on the structure and function of this protein will be presented based on research of current literature. Protein Explorer generated figures should highlight important structural aspects of your protein and indicate specific amino acids that are critical to its function. The paper should be 5 -7 pages in length and included at least three references from the scientific literature. This research paper will be due two weeks following completion of lab III.

**Formal Lab Report:** Students will be prepare a formal lab report based on experiment VII. The guidelines for the preparation of this report are found in the introduction section of the lab manual. This report should not exceed 7 pages and will be due **Thursday, December 9**th.
Exams: Exams will include both long and short answer questions. The final exam will be cumulative. A tentative schedule for exam dates appears on the syllabus. Only illness that is documented in writing by student health services or your physician will be considered an acceptable reason for missing an exam. Students with a special educational need which results from a documented disability should see me as soon as possible.

Informal Writing: Students will reflect on and react to each of the journal articles assigned in a short (1 page) essay. The writings may comment on the relationship of the article to course content, discuss questions you have about the information presented, and/or describe your reaction to the information presented. This informal writing is designed to serve as preparation for class discussion.

Grading: Informal writing 5 %
Class participation 5 %
Problem sets & case studies 10 %
Exam I 15 %
Exam II 15 %
Final Exam 20 %
Lab Notebook 5 %
Summary lab reports 15 %
Research Paper 5 %
Formal Lab Report 5 %