

Instructor Dr. Nathan J. Malmberg

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Lab Text While no textbook is officially required for this course, a textbook with biochemical protocols, such as Modern Experimental Biochemistry, Third Edition by Rodney Boyer may prove useful for helping you set up your experiments during the semester.

Also Required A cross-ruled bound notebook and a lab coat and goggles will be important for recording observations and wearing appropriate safety apparel, respectively.

Course Meets Wednesday at 1:00-5:00 PM in Wood 209

Description Experimentation in recombinant DNA techniques, genetic and enzymatic regulation, and enzyme-coenzyme interactions. Prerequisite: Grade of C or better in CHEM 460 or concurrent enrollment in CHEM 460. Additional fee required.

Goals The main purpose of Biochemical Methods is to gain an understanding of current methods of biochemical experimentation. To this end, you will select a series of biochemical experiments to perform independently in the lab. These experiments may be of your own design, or may be based on other lab experiments, but the experimental plan must be checked by Dr. Malmberg in order to verify the feasibility and acceptability of the proposed experiments. When you complete the experimental series, you will prepare a poster outlining the experimental details and results of the experiments.

We will also study current biochemical experimental design through the study of primary literature. Through our discussion of these articles, we will have a better understanding both of the current techniques utilized in biochemistry as well as current approaches to biochemical problems.

Additional Info regarding disabilities, academic dishonesty, attendance, important semester deadlines, etc. can be found in the university-wide syllabus attachment located online at http://www.okbu.edu/academics/forms/Syllabus_Attachment_Spring09.pdf.

Academic Dishonesty will not be tolerated. Falsification of data, sabotage of other students' experiments, or plagiarism of other works will result in a loss of credit for that segment of the semester and may result in further disciplinary action by the University. For further elaboration of the University's policies on academic dishonesty, see the online syllabus attachment.

Safety Safety rules must be obeyed at all times. Failure to follow safety rules can result in serious injury or even death. Safety rules include:

- No horseplay in the lab.
- No unauthorized experiments.
- No food or drink in the lab at any time.
- No open-toed shoes.
- Know where all the exits are located.
- Know what kinds of hazards the chemicals you are working with will present.
- Know the experimental procedure for the lab.

- Safety goggles must be worn at all times in the lab.

Cleanliness Maintaining a clean work area is both a safety issue and a fiscal issue. Many of the chemicals we will be working with look uninteresting, but are extremely hazardous. Make sure all spills are cleaned immediately, and don't leave unmarked containers of chemicals sitting around.

Attendance Attendance is required for this course. A significant fraction of your score will be based on your attendance, as your participation in discussions and presentations will constitute much of your assessment in this course. While we can be somewhat flexible in how our time is utilized in this course, your presence is important in this class. Exceptions will be made for:

- University-sponsored activities. You must make alternative arrangements with me at least a week in advance.
- Documented medical absence.
- Death in the family.

If you do miss a lab, we need to make alternate arrangements as soon as possible.

Independent Project You will propose and present an experiment that is performed according to your schedule of events. The project should be one that takes several weeks to complete, and one that reflects significant principles in biochemical experimentation. You may consult with Dr. Malmberg for ideas regarding the project, or you may decide your own interests. A plan must be presented to Dr. Malmberg by February 25. The plan must include a bibliography of three or more sources describing other similar experiments or the procedures you will be using in your project. Dr. Malmberg will advise if the plan must be supplemented or enhanced. Once a suitable plan has been proposed, Dr. Malmberg will order the materials you request such that experiments can begin as soon as possible. You will then begin your experiments, recording procedures and results as you go. When you have completed your experiments, you will draft a poster presenting the results of some or all of your experiments. The rough draft for this poster is due May 13, and the poster will be presented during the final exam time for this course as set by the university. After the poster presentation you will turn in your lab notebook for grading as well.

Article Presentations In addition, you will also present two articles to the rest of the class which illustrate different aspects of current biochemical methodology. You will select these articles yourselves from the most current issue of *Biochemistry* (not the Articles ASAP), located online at <http://pubs.acs.org/journals/bichaw/index.html>, but the selections of the class must represent a broad spectrum of methods, including (but not limited to):

- Characterization of a novel metabolite
- Collective characterization of large numbers of biomolecules (ie omics)
- Characterization of a protein-ligand interaction.
- High-resolution protein structure determination.
- Low-resolution structure determination of a large biochemical complex.
- Novel structure characterization methods.
- Kinetic analysis of enzyme activity.

Your presentation should include an introduction to the methodology, a presentation of the results of the experiment (including an explanation of the figures in the paper), the conclusions of the paper and your own estimation of what was missing from the paper (controls, etc). Your presentation should

be no more than 30 minutes in length, and will be given during regular lab time. No more than two presentations will be allowed during any one class period, and no paper presentations will be allowed on the days on which experiment presentations are given. It is in your best interest to select at least one article as soon as possible to present it early in the semester.

When you have selected an article for presentation, inform Dr. Malmberg, who will post the citation for the article on the website. The class will then have (at least) one week to read the article before you make your presentation in class.

Grades Grades will be assessed by the following allotment:

Attendance	100
Participation	100
Article Presentations	200
Experimental Plan	100
Notebook	100
Experimental Poster	400
Total	1000

Grading Scale Grades will be based on the following scale: 90–100% A, 80–89% B, 70–79% C, 60–69% D and below 60% F. This scale may be adjusted downward by the instructor, but don't count on it.

Tentative Lab Schedule Spring 2009

2/4	Introduction
2/11	First Presentation
2/18	Research Experiments
2/25	Select Experiment
3/4	Order Supplies for Experiments
3/11–5/6	Perform Experiments
5/13	Rough Draft of Poster
Finals Week	Final Presentation