

Spring 2012  
Chem 465L Biochemistry Lab II  
Black Hills State University  
Tu 2 - 4:50 BSB 101

**Instructor:** Dr. Micheal Zehfus  
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**Text and material:**

*Experiments in Biochemistry A Hands-On Approach* 2<sup>nd</sup> ed. Farrell & Taylor.  
Supplementary Lab Manual

**Course Description:**

This course will focus on the Biophysical and Thermodynamic nature of nucleic acids and proteins. Specific emphasis will be placed on the design, synthesis, and thermodynamic analysis of an RNA model system. The aim of the course will be to provide the student with a solid basis in thermodynamics of folding of biologically important macromolecules.

**Course Outline:**

Week	Date	Lab
0	1/10	Classes start on Wednesday, so no lab
1	1/17	Experiment 7a Gel Chromatography of LDH
2	1/24	Experiment 7a - Continued
3	1/31	Determination of $\Delta G$ of Hexokinase reaction
4	2/7	<i>en Vitro</i> $^{13}\text{C}$ analysis of Anaerobic Yeast metabolism using NMR
5	2/14	NMR analysis of the Fumarase reaction
6	2/21	Experiment 9c SDS-PAGE (Answer Prelab questions for 9b)
7	2/28	Experiment 9 or 9a Native gel electrophoresis (Answer Pre-lab questions for 9)
	3/6	No classes - Spring Break
8	3/13	DNA Denaturation I (UV)
9	3/20	DNA Denaturation II (IR)
10	3/27	DNA supercoiling
11	4/3	DNA supercoiling
12	4/10	DNA data mining
13	4/17	Experimental Lab - Detecting ATP/ADP in living cells using $^{31}\text{P}$ NMR
14	4/24	Lab Clean-up/ <b>Lab final</b>

The labs outlined above should be considered highly experimental. Dr. Z has actually only done two of these labs before, and the experimental lab listed for 4/13 & 4/22 has never been done before! There is some flex in the schedule, and some labs are listed twice with the thought that we might go back and try them a second time if they don't work the first time (supercoiling lab). Treat the labs as real experiments that may or may not work, rather than cut and dried procedures. I may or may not be able to give you detailed procedures the week before the lab, but hopefully I will have something at least by the day of the lab.

### **Evaluation**

Students will work in groups of 2-3 students/group. By now you should have learned the importance of keeping a good lab notebook, so I expect you to do so for this lab, although I will not collect or grade your notebooks.

I will be taking notes each week on how each person in a group is contributing to the group effort, thus attendance will be important in grading.

These kinds of labs do not fit into a once a week, three hour time slot very well, so expect to come in occasionally at odd hours to set up or finish experiments as needed. One reason for working in groups is to help spread these odd hours out between several people so no one person is excessively burdened. Since I will not be able to keep track of these off hours, please see me if you feel you, or a person in your group, is not being given fair treatment.

There **will** be a lab exam during the final week of classes. The lab final will be worth 1/4 of the lab grade. The emphasis in this test will be to test the concepts and logic behind the experiments rather than the experimental details. This will be an open lab notebook exam, so this is where I will find out if you kept a good notebook.

### **Disabilities**

Reasonable accommodations, as arranged through the Disabilities Services Coordinator, will be provided students with documented disabilities. Contact the BHSU Disabilities Services Coordinator, Mike McNeil, at 605-642-6099, (Jacket Legacy Room in the Student Union) or via email at [mike.mcneil@bhsu.edu](mailto:mike.mcneil@bhsu.edu) for more information. Additional information can also be found at <http://www.bhsu.edu/StudentLife/Learning/DisabilityServices/tabid/162/Default.aspx>

### **Academic Dishonesty**

A student who, in connection with his or her studies, disrupts a class, plagiarizes, cheats, or otherwise violates reasonable standards of academic behavior may, at my discretion, have his or her enrollment canceled and/or be given a reduced or failing grade. For more information on specific acts that can constitute academic dishonesty, see your student handbook.

### **Academic Freedom and Responsibility**

Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the chair of the department in which the course is being taught to initiate a review of the evaluation.