

## **BIOCHEMISTRY I LAB (Che or Bio 482-L)**

Fall, 2003

Tues. and Thurs. 8:00 - 11:00

SC 366

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**OFFICE HOURS:** Monday and Friday 9AM-11 AM (note: if I am not in my office try the lab). I can generally meet at other times if I am available so don't hesitate to look me up.

**REQUIREMENTS:** Biochemistry Lab Manual, Fall 2003; Lab Record Book that makes copies; IBM Formatted disc for lab work

### **COURSE GOALS:**

- (1) *To work effectively in groups...*All experiments will be conducted in pairs and sometimes larger groups will collaborate.
- (2) *To come prepared to complete a given task (experiment)...*For each experiment you will be responsible for coming to lab well prepared and with your pre-lab assignments completed.
- (3) *To keep good records of your lab work...* You will record all that you do during lab in a notebook that makes copies. These copies must be turned in each day before you leave the lab. The pages will be graded and your reports will be compared to the data you record during lab.
- (4) *To prepare written reports documenting work...*All of the lab reports are formal reports, except for the last one. Some will be so-called short reports. We won't use forms that you fill out with your data, as you might do in more introductory courses. The goal is for you to learn how to organize your own data and present it in as brief and readable format as possible.
- (5) *To use a computer for a variety of tasks...*All data analyses will necessarily be completed using spreadsheet programs. In addition, all reports must be typed on some word processing program.
- (6) *To think for yourself in a lab...*Unlike in more entry level courses, this course is designed to make you often think about your own experiments and to come up with your own ways to find an answer to a problem. The experiments are designed to ask relatively simple questions and to guide you into answering them yourself.
- (7) *A variety of simple biochemical principles and techniques...*The experiments are not difficult. They represent a reinforcement of some basic principles you will have learned ahead of time in lecture.

## **TIME:**

The time required to complete each experiment will depend HEAVILY on the students' effectiveness in preparation. Each experiment is *easily* finished in the lab period IF students have properly prepared for lab. (The notable exceptions will be times when one student from each group will have to return to lab later that day or the next day to develop a chromatogram, remove a gel, etc.) There will be no formal make-ups for missed labs. However, time for work outside normal lab times will be allowed for catch-up when necessary due to equipment limitations.

## **LAB NOTEBOOK:**

You are expected to keep a lab notebook which makes copies (available in the bookstore) where you keep track of pre-lab lectures (if you like), your procedures, data collected, and initial interpretations of data taken in the lab. These notebooks are to reflect your ability to document what you do IN the lab, not to reflect what you remember to write down AFTER the lab. These lab notebooks need not be incredibly neat, but they do need to be easily followed. They also need to contain *completely* all important data, procedures, etc. You are to turn in the copies of your daily notebook BEFORE you leave lab each day. If you do not turn in the lab notebook copies at the end of lab, points will be deducted for lateness. (The copies are generally worth about 10 points per lab day.) The copies will be graded according to how completely your *methods*, your *observations*, and your *data* are recorded. They will be turned back to you with each graded lab report; the scores of the lab sheets will be integrated into the lab report grade.

## **LAB REPORTS:**

All lab reports will be formal reports; some experiments will require full reports and some will only require short reports. You will find a complete description of what is expected in a lab report in your lab manual.

All experiments will be conducted in pairs. For all but the last two experiments, each student will INDEPENDENTLY prepare a lab report with the gathered data. If I feel that I have been handed essentially two identical reports from the two partners working together to prepare the reports, I will grade only one report and each partner will receive half the score of the graded report. Lab reports are due by 12:00 noon on the days listed on the schedule. Unannounced quizzes will start if students begin coming late to lab or skipping labs to finish preparing reports.

### **LATE LAB REPORTS WILL NOT BE ACCEPTED.**

The value of each report varies depending on the number of weeks of the experiment and whether the report is full or short. These values are listed on the schedule of experiments. The final report grade will reflect:

- how clearly and accurately the data are presented
- the accuracy of an unknown determination
- how well the experiment is analyzed in the discussion
- how well the lab notebook sheets are prepared
- how correctly grammar is used
- how well the introduction and methods are presented (when applicable)
- the overall appearance of the report

### **POSTER PRESENTATION:**

The last experiment will culminate in each pair of students presenting their work in poster form to the class and any faculty that are able to make it. No formal report will be handed in. However, each pair of students will turn in a stapled copy of all the pages used on the poster.

### **HOMEWORK:**

The pre-lab questions associated with each experiment are considered homework. They are spread throughout each chapter at the points where they fit best with the information covered. The questions must be completed and turned in at the BEGINNING of the lab period, generally the first day of each experiment; they were specifically designed to prepare you for the experiments and to allow you to finish the experiments easily within the lab period. Any time you do not understand something in the lab manual, you need to see me BEFORE the morning of the lab. If you do not complete AND understand the pre-labs, you will not finish most labs in time. The post-lab questions are also considered homework. The answers to these questions are to be handed in on the day the lab reports are due. Answers to questions with a \* by them would work well incorporated into your report, but the answers will be graded on the homework. The pre-lab and post-lab answers are worth 10 points each.

### **QUIZZES and EXAMS:**

There will be quizzes during the semester. They will be announced most of the time (or unannounced if people start coming to lab late.) At the end of the semester, we will have a comprehensive final covering the procedures and theories learned in lab.

### **GRADING:**

The final grade will be a combination of lab reports, lab notebook, poster presentation, final exam and quizzes, homework, and lab participation.

<b>Items</b>	<b>Points</b>	<b>Grade scale</b>
Lab reports (includes notebook and poster)	570 points	A = 90 % -100 % B = 80 % - 89% C = 70 % - 79 % D = 60 % - 69 % F = 0 % - 59 %
Homework	120 points	
Final exam	100 points	
Lab participation	30 points	
Quizzes	0-100 points	
Total	820-920 points	

Last day to drop with an X is September 12 and with a W is October 31.

**The date of final exam is during finals week, Tuesday, December 16, 8:00-12:00.**

## TENTATIVE LAB SCHEDULE, 2002

DATE	Exp.	To Be Done	Due	pts.
8/26	1, computer	computer training, dry lab	---	
8/28	2, buffers	buffer exploration	pre-lab exp. 2	10
9/2	"	make phosphate buffer as in manual		
9/4	"	discovery/buffer unknown	<b>lab report #1, short/?s</b>	<b>30/10</b>
9/9	"	computer analysis and calculations		
9/11	3, pNPP	prepare stds., measure at given pH	pre-lab exp. 3	10
9/16	"	prepare stds., measure at diff. pH	<b>lab report #2, short/?s</b>	<b>70/10</b>
9/18	"	computer analysis and calculations	---	
9/23	4, [protein]	determine concentration of unknown	pre-lab exp. 4	10
9/25	"	UV analysis of proteins, computer		
9/30	"	computer analysis and calculations	<b>lab report #3, short/?s</b>	<b>50/10</b>
10/2	5, protein size	pour gel, run knowns	pre-lab exp. 5	10
10/7	"	run unknown, read samples		
10/9	"	read unk., make PAGE samples		
10/14	"	run page gel	<b>lab report #4, full/?s</b>	<b>70/10</b>
10/16	protein size	data analysis, discussion		
10/21	Fall Break	Lab will not be open		
10/23	6, enzymes	optimum conditions determination	pre-lab exp. 6	10
10/28	"	V vs. S curve		
10/30	"	inhibitor study		
11/4	"	complete assays, Data analysis	<b>lab report #5, short/?s</b>	<b>100/10</b>
11/6	7, purification	purification steps	---	
11/11	"	purification steps		
11/13	"	purification steps	<b>JOINT lab report #6, full/?s</b>	<b>100/10</b>
11/18	"	PAGE on purification fractions		
11/20	"	complete sample analyses		
11/25	---	poster preparations		
11/27	NO SCHOOL	Lab will NOT be open; eat turkey		
12/2		poster preparations		
12/4	---	evaluations, course review		
12/9	---	presentations	<b>POSTER/?s</b>	<b>150/10</b>
12/11		Presentations cont. ( if necessary)		
12/16	---	<b>FINAL EXAM</b>	8:00-10:00	100

## **THE LEGAL PAGE:**

**All items on this syllabus are subject to change by the instructor.**

**Students are responsible for reading and understanding all items on this syllabus. Any items not understood must be brought to the attention of the instructor within the first two weeks of class.**

**"The work you will do in this course is subject to the Student Honor Code. The Honor Code is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of Northern Kentucky University will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements."**