BIOCHEMISTRY I LABORATORY

CHE 482L / BIO 482L
FALL 2006

Time:	TR 9:25 - 12:25
Location:	SC 368
Instructor:	Dr. Stefan Paula
	SC 452
	572-6552
	paulas1@nku.edu
Office hours:	M 12:00 – 2:00
	F 12:00 – 2:00
	or by appointment
Requirements:	Biochemistry Lab Manual, Fall 2006; Lab Record Book that makes copies
Pre/Corequisite:	CHE 482 / BIO 482

Course description:
You will learn commonly used laboratory techniques in biochemistry, such as isolation, purification, and characterization of proteins. You will receive training in the use of modern equipment for experimentation and of computers for data analysis and will learn how to write professional reports.

All experiments will be conducted in groups of 2 students.

You are expected to come to the lab prepared to complete a given experiment. This requires reading the appropriate sections of the manual and completing the pre-lab assignments *beforehand*.

Students need to keep good records of their work in a notebook that makes copies. These copies must be turned in each day before leaving the lab and are part of the report grade.

Computers will be used throughout this course for data analysis. You will use spreadsheet programs such as Excel and graphics programs such as Kaleidagraph and Graphical Analysis.

Unlike some of the entry level courses, this course will require you to think about your 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.

TIME:
The experiments are designed so that they are *easily* finished in the lab period if students have properly prepared for lab. There will be no formal make-ups for missed labs. Time for work outside normal lab times will only be allowed for catch-up due to equipment limitations.

SAFETY:
For safety reasons, you are required to wear *goggles* and *closed-toed shoes* in the lab (no exceptions). This includes times when you and your partner may not be actively doing experimental work but other people in the lab are.

LAB NOTEBOOK:

You are expected to keep a lab notebook which makes copies (available in the bookstore) to keep track of pre-lab lectures, your procedures, data collected, and initial interpretations of data taken in the lab. These notebooks should reflect your ability to document what you do IN the lab, not what you remember to write down AFTER the lab. Your notes should be well-organized and need to be easily followed. They also need to contain *completely* all important data, procedures, etc. You will 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 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. Examples for a "good" and a "not-so-good" notebook page are included in the manual.

LAB REPORTS:

All lab reports will be formal 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. With the exception of the last experiment, 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 at 9:25 am* on the days listed on the schedule.

LATE LAB REPORTS WILL NOT BE ACCEPTED.

The value of each report varies depending on the length and level of difficulty of the experiment. 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
- the overall appearance of the report

Questions regarding grading of reports, homework, quizzes, and the final must be submitted to the instructor *within one week* after the work has been returned to students.

POSTER PRESENTATION:

The last experiment will culminate in each pair of students presenting their work in poster form to the class and some faculty members that are able to attend. No formal report will be handed in. However, each pair of students will turn in a small printout or stapled copies 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. You should have answered these questions before the beginning of the first day of each new experiment because they are specifically designed to prepare you for the experiments and to allow you to finish them easily within the lab period. Before each new experiment, you will be given a *short quiz* on the topics covered in the homework.

The *post-lab questions* are considered homework. The answers to these questions are to be handed in on the day the lab reports are due. The post-lab answers are worth 10 points each.

QUIZZES and EXAMS:

With the exception of the first experiment, there will be a *short quiz prior to starting each new experiment*. Each quiz will be worth 10 points. You can expect the questions to be very similar to the prelab problems that you are supposed to have completed at that day. In addition, there may be unannounced quizzes 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.

Items	**Points**	**Grade scale**
Lab reports (includes notebook and poster)	570 points	
Homework (post-lab questions)	60 points	A = 90 % -100 %
Final exam	150 points	B = 80 % - 89%
Lab participation	30 points	C = 70 % - 79 %
Quizzes	≥ 60 points	D = 60 % - 69 %
		F = 0 % - 59 %
Total	≥ 870 points	

Last day to drop without a grade is September 11 and with a W is October 30.

The date of final exam is during finals week, Tuesday, December 12, 10:10 - 12:10 pm.

TENTATIVE LAB SCHEDULE, 2006

DATE	Exp.	To Be Done	Due	pts.
T, 8/22	1, data analysis	computer training, dry lab	---	
R, 8/24	2, buffers	buffer exploration	pre-lab exp. 2 / quiz	10
T, 8/29	"	make phosphate buffer as in manual	---	
R, 8/31	"	discovery/buffer unknown	**lab report #1 due**	**30**/10
T, 9/5	"	data analysis	---	
R, 9/7	3, pNPP	prepare stds., measure at given pH	pre-lab exp. 3 / quiz	10
T, 9/12	"	prepare stds., measure at diff. pH	**lab report #2 due**	**70**/10
R, 9/14	"	data analysis	---	
T, 9/19	4, protein conc.	determine concentration of unknown	pre-lab exp. 4 / quiz	10
R, 9/21	"	UV analysis of proteins	---	
T, 9/26	"	data analysis	**lab report #3 due**	**50**/10
R, 9/28	5, protein size	pour gel, run knowns	pre-lab exp. 5 / quiz	10
T, 10/3	"	run unknown, read samples	---	
R, 10/5	"	read unknowns, make PAGE samples	---	
T, 10/10	"	run PAGE gel	**lab report #4 due**	**70**/10
R, 10/12	"	data analysis	---	
T, 10/17	Fall Break	**lab closed**	---	
R, 10/19	6, enzymes	determination of optimum conditions	pre-lab exp. 6 / quiz	10
T, 10/24	"	V vs. S curve	---	
R, 10/26	"	inhibitor study	---	
T, 10/31	"	complete assays, data analysis	**lab report #5 due**	**100**/10
R, 11/2	7, purification	purification steps	pre-lab exp. 7 / quiz	10
T, 11/7	"	purification steps	---	
R, 11/9	"	purification steps	---	
T, 11/14	"	purification steps	**lab report #6 due**	**100**/10
R, 11/16	"	PAGE on purification fractions	---	
T, 11/21	"	complete sample analyses	---	
R, 11/23	Thanksgiving	**lab closed**	---	
T, 11/28	---	poster preparations	---	
R, 11/30	---	poster presentation	**POSTER**	**150**/10
T, 12/5	---	evaluations, course review	---	
R, 12/7	---	TBA	---	
T, 12/12	---	**FINAL EXAM**	10:10-12:10	100

Policies of the Department of Chemistry at Northern Kentucky University

All items on syllabi are subject to change by the instructor.

Students are responsible for reading and understanding all items on the syllabi. 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 any 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.

Cheating will not be tolerated. In accordance with the Code of Student Rights and Responsibilities, faculty members have the right to determine actions to be taken when a student is caught cheating.

Faculty members reserve the right to dismiss or to have removed a disruptive student from their classrooms.

For web-enhanced courses only:
This is a web enhanced course. Students meet at regularly scheduled class time and will need access to the internet to fulfill course requirements.