

# **BIOCHEMISTRY LAB**

**(554)**

Syllabus

Professor Testa

# Biological Chemistry Laboratory

## Tentative Schedule (Spring 2008)

Instructor:	Dr. Stephen Testa
Office: Room 319	Phone: 7-7076
Email:	<a href="mailto:testa@email.uky.edu">testa@email.uky.edu</a>
Lab:	Tuesday and Thursdays from 1:00 PM to 3:50 PM in CP-236
Lectures:	TBA from 1:00 to 2:00 in CP-211
Textbook:	Experimental Biochemistry (3 <sup>rd</sup> Edition), Switzer and Garrity.

### Teaching Assistant

Sarita Hardas

### Details and Grading

There are a total of 7 lab reports due in this class. The worth of each report is listed at the bottom of this syllabus. All lab reports combined account for 75% of your final grade. Each of the two exams will count towards 10% of your final grade. The remaining 5% will be up to the discretion of the instructor and/or the lab TAs regarding all measures of laboratory conduct. This includes safety issues, being prepared, being independent, etc.

Lab reports are graded by the TAs, although any comments or concerns you have regarding such grading should be brought to your instructor's attention (after first discussing the matter with your TA). Information concerning how to write your reports will be provided separately. Reports not turned in on time, unless approved for excused reasons, will be given a 33% grade reduction for being 0.25-24 hours late, 66% for 24-48 hours late, and 100% thereafter.

Because this is a 500-level class, differentiation must be made between the expectations for undergraduate and graduate students. Because this is an introductory laboratory class, and because all experiments are necessary to satisfy the requirements for ACS accreditation for this course, all students will be expected to complete all assignments. Therefore, this differentiation will manifest itself in the following ways:

- 1) Undergraduate reports will be graded with more of a focus on understanding the experiments (the results will be deemphasized).
- 2) Undergraduates will not have to answer all the test questions, but a defined subset.

## Attendance

Attendance is mandatory. After the first *unexcused* absence, each additional *unexcused* absence will result in a single letter reduction in your final grade. This includes lecture days. Anyone more than 10 minutes late to class will be considered absent and will not be able to participate on that particular day. Because of the nature of preparing for biological chemistry experiments, they are difficult to make up on an individual basis. Therefore, students will be permitted to make up excused absences by completing the alternative experiments planned on the days marked 'TBA'. Note that these experiments could include the experiment that was missed. Note: I am very strict with attendance, so please attend all classes.

## Office Hours

My office hours are 30 minutes before and after each class. If you need to speak with me at any other times, you can stop by my office and see if I am available or you can make an appointment. Remember, I am here to help you with this class. If you need help, I expect you to tell me.

## Course Material

This class will use the textbook "Experimental Biochemistry" (3<sup>rd</sup> Edition), Switzer and Garrity, W. H. Freeman and Company, New York. You must have the textbook. I will also make available to you, in electronic form, all of my lectures. I recommend that you print them out and have them with you on the lecture days.

## Miscellaneous

The student is responsible for all equipment they use. In other words, if you break it, you are responsible for replacing it. The student will also be responsible for obtaining a lab coat, a lab notebook, a memory stick, and a combination lock (you must give me the combination). Make sure the notebook has the yellow pages you can rip out and hand in.

Lab coats and goggles have to be worn in the lab at all times. Cell phones need to be turned off except for pre-approved reasons. Anyone behaving in an unsafe or disrespectful manner in the lab will be made to leave the lab and a grade of zero assigned on the given lab assignment.

Cheating in any form will not be tolerated, and will result in a grade of zero for the final grade of the course. Please note that cheating takes many forms. I will summarize what I expect: everyone must work on their experiments and reports completely independent of others. You are not allowed to share data. You are allowed to discuss your experiments with others, but the reports must be 100% your data, your words, and your answers and conclusions.

# Biological Chemistry Laboratory

## Spring 2008 Schedule

January 10	(Week 1; Day 1):	Introduction to this course
January 15	(Week 2; Day 1):	Safety and setting up
January 17	(Week 2; Day 2):	Learn basic techniques
January 22	(Week 3; Day 1):	<i>Lecture on Photometry (lab prep)</i>
January 24	(Week 3; Day 2):	Laboratory Assignment # 1: Photometry - Protein Absorption (Exp 1)
January 29	(Week 4; Day 1):	(*) <i>Lecture on Chromatography (lab prep)</i>
January 31	(Week 4; Day 2):	Laboratory Assignment # 2: Chromatography - Protein Separation (Exp 2)
February 5	(Week 5; Day 1):	(*) <i>Lecture on ELISA (lab prep)</i>
February 7	(Week 5; Day 2):	Laboratory Assignment # 3: ELISA (Exp 17)
February 12	(Week 6; Day 1):	(*) <i>Lecture on Kinetics (lab prep)</i>
February 14	(Week 6; Day 2):	Laboratory Assignment # 4: Properties of $\beta$ -Galactosidase (Exp 7)
February 19	(Week 7; Day 1):	Laboratory Assignment # 4: Properties of $\beta$ -Galactosidase (Exp 7)
February 21	(Week 7; Day 2):	Review
February 26	(Week 8; Day 1):	Exam #1
February 28	(Week 8; Day 2):	(*) <i>Lecture on the Polymerase Chain Reaction (lab prep)</i>
March 4	(Week 9; Day 1):	Laboratory Assignment # 5: The Polymerase Chain Reaction (Exp 24)
March 6	(Week 9; Day 2):	Laboratory Assignment # 5: The Polymerase Chain Reaction (Exp 24)
March 11	Spring Break	
March 13	Spring Break	
March 18	(Week 10; Day 1):	(*) <i>Lecture on Affinity Purification, SDS Page, Western Blot (lab prep)</i>
March 20	(Week 10; Day 2):	Laboratory Assignment # 6: Purification of GST(Exp 10)
March 25	(Week 11; Day 1):	Laboratory Assignment # 6: Western Blot to Identify an Antigen (Exp 18)
March 27	(Week 11; Day 2):	Laboratory Assignment # 6: Western Blot to Identify an Antigen (Exp 18)
April 1	(Week 12; Day 1):	(*) <i>Lecture on Molecular Biology (lab prep)</i>
April 3	(Week 12; Day 2):	Laboratory Assignment # 7: Molecular Biology (Cloning)
April 8	(Week 13; Day 1):	Laboratory Assignment # 7: Molecular Biology (Cloning)
April 10	(Week 13; Day 2):	Laboratory Assignment # 7: Molecular Biology (Cloning)
April 15	(Week 14; Day 1):	Laboratory Assignment # 7: Molecular Biology (Cloning)
April 17	(Week 14; Day 2):	Laboratory Assignment # 7: Molecular Biology (Cloning)
April 22	(Week 15; Day 1):	Laboratory Assignment #7: Molecular Biology (Cloning)
April 24	(Week 15; Day 2):	(*) Review and clean up lab

Final Exam: May 2 - 10:30 am

# Lab Reports

Lab reports are due ***before class starts*** on the following days

	<u>Report Due</u>	<u>Points</u>
Laboratory Assignment #1	January 29	10 points
Laboratory Assignment #2	February 5	10 points
Laboratory Assignment #3	February 12	10 points
Laboratory Assignment #4	February 28	15 points
Laboratory Assignment #5	March 18	10 points
Laboratory Assignment #6	April 1	20 points
Laboratory Assignment #7	April 24	25 points

# Report Guidelines

The basis of the lab report in this class is the notebook. All required information will be hand written in your notebook, and your notebook will be graded as your lab report. The only exception is processed data, which will be taped into your notebook.

The TA will grade your lab report, but your instructor will be glad to discuss the grades with you. Each of the ten sections below will be graded independently using a grading scale of 1 through 10, where 1-2 is poor, 3-4 is not very good, 5-6 is good, 7-8 is very good, and 9-10 is excellent. For each report, all grades will be combined, a class curve will be developed, and alphabetic grades will be assigned. The Prelab will be worth 30% of the final grade, the Lab 60%, and the PostLab 10%.

## Prelab

The prelab is to be completed in class after the lecture. You will have at least two hours, and it is to be done in the presence of the TA. This is designed so that you can ask the TA questions and discuss the experiment with your lab mates. The TA will grade your prelab before you leave class on lecture day. You will be graded on whatever you have finished by the time class is over. I expect the prelab to take about 30 sentences, and must contain the following sections:

1. *Experiment Summary*: An overview of the experiment that you will be doing.
2. *Experimental Design*: A detailed description of the theory behind the experimental design, including how you expect the experiment to conclude. This is not the place for listing the experimental steps, but you should know them before you conduct the experiment.
3. *Expected Learning Outcomes*: A summary of what will you learn by doing the experiment. Keep in mind both the technology and the particular experiment.
4. *Theory of the Technique(s)*: Each experiment is designed to teach you one or more new techniques. What are they and describe the theory behind them. You can do this any way you feel is most effective, including drawing pictures.

## Lab

You are expected to write everything in your lab notebook as you conduct the experiment. This includes changes to the textbook's protocol, data, and any notes. Nothing should be written on scratch paper, and nothing should be rewritten. I expect the lab section of your notebook to have the following sections:

1. *Experimental observations*: This includes anything you write down while you are doing the experiment. Examples include all raw data, all observations, and any notes.
2. *Experimental protocol*: Write the exact experimental protocol that you followed. Make sure to highlight any changes from the book.
3. *Data Processing*: All processed data, including legends for each figure. This will mostly be graphs.
4. *Questions*: Answer any questions asked within the protocol of the textbook. Be sure to make it clear which questions you are answering.
5. *Conclusions*: All experimental conclusions. These should be numbered. Explain in your notebook how the data support each of your conclusions.

## PostLab

In about 10 sentences, restate what you did, the conclusions, and the actual learning outcomes.