

Course Syllabus Fall 2009

CHEM 4130L Biochemistry I Lab (1 Credit)

Class Meeting: Section 1 (80198) Monday 2:00 pm – 4:50 pm NCF Room 316
Section 2 (80199) Tuesday 7:50 am – 10:40 am NCF Room 316
Section 3 (80200) Tuesday 1:15 pm – 4:05 pm NCF Room 316
Section 4 (80201) Wednesday 2:00 pm – 4:50 pm NCF Room 316
Section 5 (80202) Thursday 7:50 am – 10:40 am NCF Room 316

Office Location and Hours of Your Instructor:

If these times are not convenient contact your instructor for an appointment.

Dr. Marion L. Carroll

Monday 10:30 AM – 12:00 PM
Tuesday 1:00 – 3:00 PM
Wednesday 8:30 – 10:30 AM
Friday 1:00 – 3:00 PM

Dr. Kelly Johanson

Monday, Wednesday 1:00 – 3:00 PM
Tuesday 9:00 – 11:00 AM

Dr. Niel McIntyre

Monday, Wednesday and Friday 2:30 – 4:30 PM

Course Description and Objectives: Selected experiments in Biochemistry covering the study of the properties of biomolecules. The goal of this course is to expose the students to techniques commonly used in a biochemistry lab. Students should learn how to use pipettes, make buffers, calculate dilutions, run agarose gels, use spectrophotometry to calculate concentrations and use Excel to make graphs. In addition students should leave the class with the ability to calculate concentrations, extinction coefficients and absorbencies using Beers Law, estimate pKa values, and calculate enzyme kinetic values. Finally students should be able to explain how restriction enzymes are used especially with regard to restriction fragment length polymorphism (RFLP) analysis and be able to explain how PCR works.

Text: “Introduction to Biochemistry - Laboratory Manual” A series of experiments compiled by Leonard Price, Donald Robinson, Tuajuanda Jordan, Nitsa Rosenzweig, and David Wolfgang Fall 2009

Supplemental Text: “Fundamentals of Biochemistry”, Voet, Voet, and Pratt, 3rd Edition

Class Structure: Students will work in pairs for each experiment. Before coming to lab, students are expected to read the theory and procedure for that week’s experiment.

During the first 10-15 minutes of each class, a quiz will be administered. The quiz will cover **BOTH** the previous week's and the current week's experiment. There will be a brief lecture on the theory and procedure before each new experiment. After completion of each experiment, a type-written report must be submitted the following week.

Class Attendance: Students should attend each class, and on time. Students are responsible for any notes, assignments, handouts, instructions, etc. given during their absence. If you do need to miss a class, make every effort to attend another section, either one of mine or that of another instructor (with their permission). If you do attend a class with another instructor let me know.

Grading: The final grade will be out of 1050 points

Exams: Students must be present for all exams!
Midterm exam – 150 points (14.3%)
Final exam – 250 points (23.8%)

The **Midterm Exam** will be cumulative of the first 5 to 6 lab experiments. The **Final Exam** will be cumulative of all experiments. Quizzes and notebooks are good study tools as well as the fine points highlighted during the pre-lab lectures. You are responsible for maintaining all notes regarding the pre-lab lectures as well as quizzes and reports particularly for your preparation for these exams.

Quizzes: Eleven quizzes worth **25 points each** (275 total points, 26.2%). There will be a **quiz before each experiment**.

Notebooks: Students are required to **maintain a laboratory notebook**. Space has been provided in your lab manual to serve this purpose. You may use a separate notebook in you choose. This notebook must be with you during every class session. A spiral notebook or composition notebook is fine. A divided notebook from a previous class may also be used. The notebook is to have a place where all your data and calculations are recorded. This is worth 45 points (4.3%) and will be checked at RANDOM during the semester.

Extra Credit: There will be a possibility of 50 extra credit points to be determined by the individual instructor.

Reports: Each student **submits an independent typed lab report for every experiment**. The reports are **30 points each** for a total of 11 labs. (330 points total, 31.4%):

Clear name, (partner's name in parentheses), section number, and date the experiment was completed.
Title of the experiment

Purpose of the experiment – one or two sentences

Experimental approach – not a detailed step-by-step procedure.

Data/results – The actual numerical data collected in a table, plus a graph if appropriate. Also include any color changes or changes in physical state if appropriate. Include **sources of error**.

Calculations – sample calculations, if the calculations are identical except for the numbers one sample calculation is sufficient.

Discussion and conclusion – A statement of whether or not the objectives were accomplished and a thoughtful explanation of the reasons why. The conclusion should be drawn from the experimental evidence, not the theoretical or anticipated results.

Always record the unknown, either number or letter.

Academic Honesty: In accordance with University policy
anyone caught cheating will fail the course.

Cheating includes but is **not restricted to**:

Handing in reports with identical text: Obviously the data will be the same for people in the same group. Write the reports on your own. **DO NOT SHARE REPORTS OR DISKS.** This is a clear violation and will result in course failure. If your partner needs the data give him/her **ONLY** the data. Copying from another student during a quiz or exam.

Using any unauthorized material during a quiz or exam.

Authorized materials are a pen/pencil, a calculator and your brain.

Final Total Point and Grade Distribution:

A = 945 – 1050

B = 840 – 944

C = 735 – 839

D = 630 – 734

F = 0 – 629

Grades for this class are usually recorded on Blackboard. This is however at the discretion of your instructor. You are responsible for retaining your quizzes, reports and exams for any discussion necessary regarding your grades with your instructor.

Experiment Schedule: See attached calendar

Biochemistry is a multi-disciplinary course that encompasses immense bodies of knowledge. This semester you will be presented with vast amounts of information. To be successful in this course, you must do a minimum of five things:

1. Read over experiments in advance of the class
2. Attend ALL labs, take good notes, ASK QUESTIONS (if you are hesitant to ask questions during class time, come see me in my office).
3. Review notes with the textbook.
4. Solve problems **ON YOUR OWN**.
5. Study for each test and quiz in advance.

EVACUATION INSTRUCTIONS:

In the event of evacuation lectures will be communicated with each student via an alternate email address regarding procedures for this course. Please provide an alternate email to your instructor when requested.

Emergency information can be obtained on the University website:
<http://www.xulaemergency.com/>

Chemistry 4130L: Biochemistry Lab Schedule Fall 2009

August-09						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24 Classes start Pipetting Exercise	25 Pipetting Exercise	26 Pipetting Exercise	27 Pipetting Exercise	28	29
30	31 Spectrophotometry of Riboflavin					
September-09						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Spectrophotometry of Riboflavin	2 Spectrophotometry of Riboflavin	3 Spectrophotometry of Riboflavin	4	5
6	7 LABOR DAY HOLIDAY	8 Preparation of Buffers	9 Preparation of Buffers	10 Preparation of Buffers	11	12
13	14 Preparation of Buffers	15 Amino Acid Titration	16 Amino Acid Titration	17 Amino Acid Titration	18	19
20	21 Amino Acid Titration	22 Protein Determination	23 Protein Determination	24 Protein Determination	25	26
27	28 Protein Determination	29 Characterization of Protein	30 Characterization of Protein	Characterization of Protein		

October-09						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Characterization of Protein	Electrophoresis	Electrophoresis	1 Electrophoresis	2	3
4	5	6	7	8	9	10
MIDTERM EXAMS						
11	12	13	14 Enzymatic activity of Catalase	15 Enzymatic activity of Catalase	16	17
FALL BREAK						
18	19 Electrophoresis	20 Enzymatic activity of Catalase	21 Kinetic properties of an enzyme preparation	22 Kinetic properties of an enzyme preparation	23	24
25	26 Enzymatic activity of Catalase	27 Kinetic properties of an enzyme preparation	28	29	30	31
November-09						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 Kinetic properties of an enzyme preparation	3 Kinetic properties of Alkaline Phosphatase Exp	4 Kinetic properties of Alkaline Phosphatase Exp	5 Kinetic properties of Alkaline Phosphatase Exp	6	7
8	9 Kinetic properties of Alkaline Phosphatase Exp	10 Restriction Analysis of DNA/PCR	11 Restriction Analysis of DNA/PCR	12 Restriction Analysis of DNA/PCR	13	14
15	16 Restriction Analysis of DNA/PCR	17 REVIEW	18 REVIEW	19 REVIEW	20	21
22	23 REVIEW	24 Alternative Review	25	26	27	28
THANKSGIVING HOLIDAY						
29	30					
December-09						

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	FINAL EXAMS	1 FINAL EXAMS	2 FINAL EXAMS	3 FINAL EXAMS	4 LAST CLASS DAY	5 QUIET DAY
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		