

Course Syllabus Spring 2010

CHEM 4130L Biochemistry I Lab (1 Credit)

Class Meeting: Section 1 (11012) Monday 2:00 pm – 4:50 pm NCF Room 316
Section 2 (11938) Tuesday 1:15 pm – 4:05 pm NCF Room 316
Section 3 (13356) Wednesday 2:00 pm – 4:50 pm NCF Room 316
Section 4 (13357) Thursday 1:15 pm – 4:05 pm 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

Tuesday 12:00 – 3:00 PM
Thursday 9:00 AM – 12:00 PM
Friday 8:00AM – 11:00 AM

Dr. Kelly Johanson

Monday, Wednesday 10:00 – 12:00 PM
Tuesday 9:00 – 11:00 AM

Dr. Neil McIntyre

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 if 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 Spring 2010

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

March-10						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Protein Determination	2 Characterization of Protein	3 Electrophoresis	4 Electrophoresis	5	6
7	8 Characterization of Protein	9 Electrophoresis	10 Enzymatic activity of Catalase	11 Enzymatic activity of Catalase	12	13
14	15 Electrophoresis	16 Enzymatic activity of Catalase	17 Kinetic properties of an enzyme preparation	18 Kinetic properties of an enzyme preparation	19	20
21	22 Enzymatic activity of Catalase	23 Kinetic properties of an enzyme preparation	24 Kinetic properties of Alkaline Phosphatase	25 Kinetic properties of Alkaline Phosphatase	26	27
28	29	30	31	EASTER HOLIDAY		
April-10						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5 Kinetic properties of an enzyme preparation and Kinetic properties of Alkaline Phosphatase	6 Kinetic properties of Alkaline Phosphatase	7 Restriction Analysis of DNA	EASTER HOLIDAY		10
	8 Restriction Analysis of DNA	9				
11	12 Restriction Analysis of DNA	13 Restriction Analysis of DNA	14 REVIEW	15 REVIEW	16	17
18	19 REVIEW	20 REVIEW	21 FINAL EXAMS	22 FINAL EXAMS	23	24
25	26 FINAL EXAMS	27 FINAL EXAMS	28	29	30	
			QUIET DAY			
			Sr. Grades due by Noon			

May-10

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
				All Final Grades Due (Noon)	Baccalaureate	Commencement
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					