

Chemistry 161  
Section: 63243  
Spring 1999  
Instructors: Dr. Da Fei Feng  
Mr. Robert Fremland

## SYLLABUS AND INFORMATION FOR CHEMISTRY 161

### Course Description

Chemistry 161, Techniques in Biochemistry, is a 2-unit laboratory course in biochemical techniques. The goal of this course is to reinforce, through laboratory experience, biochemical principles. In addition, this course will introduce many useful biochemical techniques commonly employed currently in research and industry. We hope that the students will gain proficiency and an appreciation for biochemical methods that will augment success in future academic and/or industrial endeavors.

It is strongly recommended that students in this course have previous or concurrent experience either in a biochemistry course (chemistry 160) or a microbiology course (biology 205), however it is not required.

### Textbooks and Equipment:

The lab manual for this course was written especially by your instructors. It is available in the bookstore. In addition, safety glasses and a lab coat or apron are required. As this is a laboratory course, it is required that students wear shoes that cover the tops of their feet and appropriate clothing.

### Office Hours:

There are three instructors for this course and which instructor is teaching on a given week will depend on the experiment. The offices and hours are as follows:

Dr. Feng: I - 206 627-2662 Hours: TBA

Mr. Fremland: I-217 627-2654 Hours: T 9 - 10 Th 9 - 11, W: 9 - 10, 11 - 12

email: rfremlan@sdccd.cc.ca.us

Voice mail automatically answers if no one is in the office so please leave a message.

### Attendance and Withdrawal Policy:

Biochemistry is, for many a difficult subject and therefore attendance to the course is extremely important. The examination material will come directly from the lab lectures and the manual. We have found, through experience, that those who regularly attend do much better in the class than those who do not. This is the only section of this course so it is extremely difficult, if not impossible, to make up missed labs.

We will drop any student who misses the first three class periods. Until **Apr. 26**, we will drop any student who misses 3 or more class periods. All other drops must be initiated by the student. This can be done by filing a drop form with the admissions office by **Apr. 26** **If you intend to drop the class, please file the necessary paperwork, do not assume that we will drop you if you do not attend.** A grade of incomplete will be given only upon verification of extenuating circumstances and only after a formal written request has been made by the student.

**Material:** All students are responsible for all material covered.

**Lab Notebooks:** Each student will be required to maintain a laboratory notebook. The format of the notebook will be the same as that of the lab reports discussed below. A lab notebook is a dedicated book, not to be used for any other class. You may use one with NCR pages or simply a spiral bound notebook. It is a good idea to keep a detailed table of contents and number the pages as it will be easier to find stuff later. You should only write on one side of the page and use a pen. Your instructor will give you more detail.

**Lab Reports:** Each experiment will be evaluated in terms of a written lab report and will be worth 60 points. The idea behind a lab report is that it should communicate clearly what was undertaken, why it was done, how it was done and what happened. For this reason, it should be clear, complete and easy to read. Though penmanship is not part of your grade, your work has to be organized and legible. Each lab report will be written in the following format:

A. Title: The descriptive title of the experiment, not the experiment number.

B. Background: A brief summary of the background chemistry for the experiment. In this section you will summarize the cogent chemistry that is being undertaken. All pertinent chemical equations should be here as well as sample calculations. Experimental design should also be discussed.

C. Procedure: Step by step description of what was done. This section should contain details. You can jot down observations and data here also if you wish.

D. Raw Data: Data should be collected in tables. It should be clear and concise.

E. Data summary (if necessary): This depends on how you gathered data originally. The bottom line is that there should be a place in your lab report where the data is neatly organized and in one place. Earlier observations can be rewritten here.

F. Calculations: Any necessary calculations should be shown here. If there are repetitions of calculations, show the work for at least one of the trials. (It is not incorrect to show your work every time.)

G. Results: The results of the experiment. What does the data say? What is the percent yield? How much is there? This section is really a summary of the results of the calculations section. You can report an average value here.

H. Discussion of results: In this section, you will take a critical look at your results. You should explain what went well or what didn't. Did data agree with theory? What were the sources of error? Discuss what you might do to improve your results if you had a chance to repeat the work. Basically, you are putting everything together here.

Your theory section is what should happen, your results is what did happen and your discussion is why it did or did not.

As students will be working in teams of 2, one lab report may be turned in for each team. It is recommended that students do the whole lab report in the lab notebook. This way students will have a permanent record of the experiments. Students may, if they desire, simply make copies of the lab notebook for the lab report.

**Exams:** There will be four, one hour, exams worth 100 points during the term. The dates will be announced at least one week prior. Each exam will cover the material presented since the previous exam. Exams will be of a short answer/essay format. They will reflect the material covered.

**Makeup Exams:** Exams cannot be made up without previous arrangement. If you are ill, please call and leave a message with the appropriate instructor.

**Term Paper:** A term paper will be assigned and will be discussed at that time. The paper will be worth 100 points. All topics must be approved by the instructor prior to writing. If the topic is not approved, 10

points will be deducted from the score. The goal of the paper is for the student to find and focus on some topic of interest and gain some knowledge **beyond** that presented in the course. Have some fun with it. All papers are due on **Friday, May 21, 1999 at the end of class**. Papers can be turned in prior to the due date and resubmitted on the due date to improve the grade.

**Grading:** The grades will be on the number of points earned during the term. Tentatively...

>90% = A  
80 - 89% = B  
70 - 79% = C  
60 - 69% = D  
<60% = F

However, this may be revised as we see fit.

### **Miscellaneous**

Cheating will not be tolerated and is grounds for removal from class, so don't cheat.

Attached is **rough** schedule. We will try to stick to the schedule. It is recommended that the student read the lab experiment prior to the class.

We highly recommend that students form study groups as this greatly enhances the educational process. However, please be aware that you are all responsible for your own work on the exams and the term paper. For this reason try to avoid study groups where everyone knows more than you and you are not a contributing member. **A study group should help you learn...it can't learn for you.**

**We reserve the right to make changes in this syllabus as we or the class see fit.**

### Tentative Lecture Schedule

<b>Week</b>	<b>Date</b>	<b>Topic/Experiment</b>	<b>Instructor</b>
1.	1/22	Introduction, Lab Safety Radioactivity	Fremland
2.	1/29	Computer Applications	Feng
3.	2/5	Titration and Buffer-Making	Feng
4.	2/19	Mammalian Cell Culture Introduction	Fremland
5.	2/26	Mammalian Cell Culture Quantitative Methods	Fremland
6.	3/5	Suspension Culture and Results from Previous Lab	Fremland
7.	3/12	Cloning Methods	Fremland
8.	3/19	Specific Activity of an Enzyme	Fremland
9.	3/26	Protein Purification using Affinity Chromatography	Fremland
10.	4/9	SDS-PAGE	Fremland
11.	4/16	Western Blot	Fremland
12.	4/23	ELISA	Fremland
13.	4/30	Genetic Analysis, Agarose Gel Electrophoresis	Fremland
14.	5/7	Sequence Analysis using a Database	Feng
15.	5/13	Finish last experiment, loose ends	Feng
16.	5/21	<b>Paper Due</b> Exam, Check out	

HPLC Experiment will be on-going all semester long in small groups to be arranged.. .Fremland