

Chemistry 100 Laboratory Course Syllabus

Fall 2002

Laboratory Course Goals

- To develop analytical, critical thinking, and problem solving skills using chemistry specific approaches, methods, and techniques you are learning in lecture and lab.
- To strengthen your skills in communicating analytical results in a clear and concise manner.
- To think about, understand, and evaluate matter on both a macroscopic and a microscopic scale.
- To develop an understanding and appreciation of the scientific method.
- To develop an understanding of how a chemist approaches and solves problems.

At the end of the Chemistry 100 laboratory course students should be able to think like a chemist to solve a small range of chemistry problems using the scientific method. This includes making observations, developing hypotheses, and designing appropriate experiments. The students should be able to perform these experiments using some of the major techniques of chemistry and construct tables and graphs to appropriately analyze and effectively represent their data. Finally, students should be able to interpret and communicate their results orally and in written form.

Content Objectives

At the end of this laboratory course students should be able to measure physical properties and discuss the uncertainty, accuracy, and precision of these measurements. Students should be able to use physical and chemical properties to separate simple mixtures, identify unknowns, make critical observations, and characterize and describe simple chemical transformations.

Grading Methods and Laboratory Course Requirements

- 15 % Pre-lab quizzes
- 15 % Notebook carbon copies
- 10 % Written laboratory exams
- 50 % Lab reports and group presentations
- 10 % Instructor evaluation

*You must pass both the lecture and the laboratory component to pass Chemistry 100.

Pre-Lab Quizzes

You must come to lab prepared. To prepare for lab you must read the assignment and any background information or required reading- BEFORE LAB!!! The lab is student centered which means YOU the students, are responsible for understanding the background information and performing each experiment. If you do not do the required reading before lab, this is impossible. Lack of preparation creates confusion and frustration. To help you avoid this, a pre-lab quiz will be given at the beginning of each lab. The quizzes may also include concepts that were discussed in a previous lab session but are repeated in the lab course over and over (accuracy, precision, uncertainty, reading graduated cylinders, scientific method, etc.). If you are late and miss the quiz, you will receive a zero for the quiz and may not be allowed to participate in lab. The pre-lab quizzes will count as 15% of your overall lab grade.

Notebook Carbon Copies

It is important to keep a clear, legible record of the work you do while in the laboratory. It should explain what you planned to do, what you observed, any changes to your plan, results, and any necessary calculations. After the experiment has been finished you should write a short summary statement. Before you hand it in, ask yourself if someone not taking the lab could read your notebook and understand what you did and what your results were. The carbon copies of the laboratory notebook write-ups will be turned in before you leave the lab. The notebook carbon copies will count as 15 % of your overall lab grade.

Written Laboratory Final Exam

Many of the concepts learned in the training workshops and assignments build on one another throughout the course. Several important themes are repeated in almost every assignment. You will be held responsible for understanding and using these important concepts throughout the laboratory course. The written laboratory exam will emphasize and evaluate your understanding of these important concepts and themes. The final will be given during your last lab session. The final, written laboratory exam covering laboratory course content will count as 10 % of your overall lab grade.

Lab Reports

A 1-2 page report in the form of a memo will be required for the assignments (7 of the 12 lab sessions). These reports should be written using a word processor. Do NOT wait until the hour before lab to write and print these reports since they constitute the majority of your laboratory grade. Write them as soon as possible after the laboratory session so that you can allow yourself time for reflection and revision. Make an outline of the important points that you must cover in explaining what you did and what the results were; then use as much creativity as possible!!!

Make sure and print out the lab reports the night before your report is due. Do not wait until just before lab to print your report- you would be surprised by how many printers fail to operate just before lab begins! If you do not hand in your work at the beginning of the lab session it will be considered one day late. Late reports lose one letter grade per day. The laboratory reports (memos) will count as 50 % of your overall lab grade.

Instructor Evaluation

Because this is a student-centered laboratory your attitude and performance can affect the other students. During the course of the semester the lab instructor will evaluate you in the following areas: *attitude, being prepared, being on time, following the safety rules, working efficiently, finishing on time, and leaving the lab clean.* The evaluation score will range from 0-100 points. Most students can expect to earn a score of 85. Exceptionally courteous, well-prepared, and efficient students can expect higher evaluation scores. Rude, quarrelsome, and unprepared students can expect lower scores. This instructor evaluation will count as 10 % of your overall lab grade.

*****10 POINTS WILL BE DEDUCTED FROM EVERYONES' LAB GRADE IF THE LAB AREAS AND THE BALANCES ARE LEFT DIRTY. CLEAN UP AFTER YOURSELF AND REPORT ANY SPILLS TO THE INSTRUCTOR IMMEDIATELY.**

Honor Code Policy

During a lab session students are encouraged to discuss the experiment with others to promote understanding and exchange ideas. If you discuss notebook write-ups, questions, and calculations with other students during lab, put the answers in your own words. **Lab reports (memos) and report sheets (including calculations) are expected to be your own work!!!!** Collaboration on lab reports is a violation of the Honor Code and will be reported to the honor council. It is also a violation of the Honor Code to copy any portion of a report from a previous semester's report. To protect yourself from this situation do not work together on lab reports - do your own work! If you need assistance ask your lab instructor. The usual penalty for students who are found to have violated the honor code is an F in the course.

Chem 100 Lab Schedule

Fall 2002

Week of:	Experiment	Title
1 Sept. 2	NO LAB	<i>Labor day holiday</i>
2 Sept. 9	<i>Check-in</i>	Check-in/Lab safety/Scientific Method
3 Sept. 16	Measurement	A training workshop
4 Sept. 23	Assignment #1	Unknown chemicals
5 Sept. 30	Assignment #2	Water Quality Assessment I
6 Oct. 7	Assignment #2 (cont.)	Water Quality Assessment II
7 Oct. 14	NO LAB	<i>Fall Break</i>
8 Oct. 21	Assignment #2 (cont.)	Water Quality Assessment III
9 Oct. 28	Assignment #3	Separating Mixtures
10 Nov. 4	Moles	A training workshop
11 Nov. 11	Assignment #4	Chemical Reactions/Unknown Chemicals
12 Nov. 18	Assignment #5	Sugar in Beverages
13 Nov. 25	NO LAB	Thanksgiving Break
14 *Dec. 2	Assignment #6	Acid-Base titrations/ Written Lab Final
15 Dec. 9	NO LAB	<i>Last week of classes</i>