

Chemistry 100 Laboratory Course Syllabus

Fall 2003

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 predictive 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.

TPSL/Water Quality Module Goals

- 1) To assimilate information
 - a. To be able to read and understand scientific, non-technical articles
 - b. To be able to pay attention in class
- 2) To process information
 - a. Apply scientific concepts to real world issues, including public policies
 - b. Synthesize information from different sources
 - c. See on a macroscopic level; understand that a microscopic level exists and can be studied in chemistry
- 3) To communicate information
 - a. Support an argument using evidence
 - b. Be able to orally communicate ideas to others
 - c. Be able to create good visual aids (effective slides) to assist with oral communication
 - d. Be able to effectively communicate with others in writing (clear scientific data presentation using tables, graphs, etc.)
- 4) Demonstrate an increased interest in science
- 5) Be aware of the characteristics of good water quality and know what causes poor water quality

Grading Methods and Laboratory Course Requirements

- 15 % Pre-lab quizzes
- 20 % Notebook carbon copies
- 5 % Written laboratory exam

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 20 % 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 5 % 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.

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.

Chemistry 100 Laboratory

HONOR CODE STATEMENT

The Oxford College Honor Code applies to Chemistry 100 laboratories. You should be familiar with the stipulations of the Honor Code. Some areas in which it applies in this laboratory include, but are not limited to:

1. Lab reports (memos and report sheets) should be considered as tests. On a lab report you may not give or receive help from anyone but an Oxford College chemistry faculty member.
2. On a lab report (memos and report sheets), you may use your book, your notes, and the lab manual, but you may not look at or use any portion of another student's lab report. This applies to the report of any student currently in the course as well as to the report of any student who has taken the course earlier.
3. A paper submitted as a lab report (memos and report sheets) must be your work and your work alone. You may not use a portion of the paper of another current or former student, or a model paper by an instructor. This means you may not reprint a portion of another paper, photocopy a portion of another paper, retype a portion of another paper, or in any way incorporate a portion of another paper, including data, tables, and figures, into your paper. In addition, you may not have anyone else type your paper. However, you may have someone proof-read your paper for its writing (but not for its content). The Honor Code provisions regarding plagiarism apply to the lab report.

You should be aware that as the instructor, I am obligated to report any suspected Honor Code violations to the Honor Council for investigation. Should you be found guilty of violating the Honor Code by the Honor Council, you should be aware that the usual penalty is an F in the course.

I have read the Honor Code of Oxford College and the above statements as to how the Honor Code applies for this laboratory. I understand them and I agree to abide by them.

Name _____

Signed

Date _____

(print name)

Lab Schedule Fall 2003

Week of:	Experiment	Title	Report Memos
Sept. 1	NO LAB	<i>Labor day holiday</i>	
Sept. 8	Check-in	Check-in/Lab safety/Scientific Method	
Sept. 15	<i>Assignment #1: Water Quality</i>	<i>Water sampling at the site</i>	*TPSL
Sept. 22	<i>Assignment #1: Water Quality</i>	<i>Water testing</i>	*TPSL
Sept. 29	<i>Assignment #1: Water Quality</i>	<i>Water Quality conference</i>	*TPSL
Oct. 6	Training workshop	Moles & Unknown Chemicals	*Water quality memo due at the beginning of lab
Oct. 13	NO LAB	<u><i>Fall Break</i></u>	*Water quality memos given back in class on Wed
Oct. 20	NO LAB	NO LAB	*Water quality revisions due on Wed during class
Oct. 27	Assignment # 2	Sugar in Beverages	*Assignment #2 memo due 48 hrs after your lab ends
Nov. 3	Training workshop	Solutions	*Assignment #2 revisions due 48 hrs after lab ends
Nov. 10	Assignment # 3	Separating Mixtures	*Assignment # 3 memo due 48 hrs after your lab ends
Nov. 17	Training workshop	Chemical Reactions	*Assignment # 3 revisions due 48 hrs after lab ends
Nov. 24	NO LAB	<u><i>Thanksgiving Break</i></u>	
*Dec. 1	Training workshop	Acid-Base Titrations/ <i>Written Lab Final</i>	
Dec. 8	NO LAB	<i>Last week of classes</i>	