CHEMISTRY 1B LABORATORY

Instructor: Dr. Larson  
Office: 5611  
Phone: (650) 949-7385

Office Hours:  
Office: 12:45-1:45 p.m. and T 1:00-1:50 p.m.  
PSME Center Room 4215: Th 1:00-1:50 p.m.

Introduction: Remember most of these lab exercises are done thousands of times by thousands of chemistry students each year, so don’t feel intimidated! Lab should be a fun experience where the concepts presented in the lecture section of the course are used and reinforced through hands-on experiences!

Required Materials for Lab:
- 1B Lab Packet: Available online at http://www.foothill.edu/psme/larson/
- A copy of Graphical Analysis software by Vernier. This is available at the bookstore and students may share, burning multiple copies of the software. Graphical Analysis is also on the computers at the PSME Center for student use in the PSME Center.
- Laboratory Notebook: 5x5 Quad Ruled Composition. (Bookstore)
- Safety Goggles (Z87 rated with splash guards) or Visorgogs: Must be purchased from Foothill Bookstore or approved by instructor.

Read the attached sheet for the Foothill Chemistry Department laboratory policies.

Safety Rules: Make sure you read and understand all of the safety rules. If you have any questions please ask.

Safety goggles must be worn at all times while working in the chemistry laboratory to guard against your own accidents as well as accidents of others. NO EXCEPTIONS will be made to this rule. Any student who does not cooperate with this policy will be asked to leave the lab and will receive zero credit for the experiment. Contact lenses should NOT be worn in the laboratory. Those students with prescription glasses will be required to wear safety goggles over their prescription glasses.

Lab Procedure/Policies: All students are expected to arrive to lab on time and to come to lab prepared to carry out the experiment scheduled for that session. This means that you have studied the experiment for the day, have a basic understanding of its purpose, procedure, and the chemistry involved and have prepared your laboratory notebook for the experiment prior to the start of lab. We ask that all students do a conscientious and thorough job of cleaning up after themselves, whether it be in their own work area in the lab, or shared areas such as the chemical supply table and balance room.

Partners in Lab: For most experiments you will work with a partner or group of students. You will share the data that is collected. However, you must do your own calculations!

Attendance: Since this is an experimental course, the presence of the student in the laboratory is essential for the understanding of the materials covered. A student may be dropped if 2 or more unexcused absences are counted. I may allow for emergencies and other complications in life.

Grading: Laboratory grading will be based upon the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Lab Tests</td>
<td>60%</td>
</tr>
<tr>
<td>Notebook</td>
<td>7.5%</td>
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<tr>
<td>Lab Assignments</td>
<td>20%</td>
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<tr>
<td>Prelab quizzes</td>
<td>7.5%</td>
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<tr>
<td>Subjective Lab Grade</td>
<td>5%</td>
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If you fail (< 55 %) either the lab test, notebook, lab assignment or prelab quiz portion of lab you will not will not receive a passing grade for lab.

Lab Tests will be open notebook. These exams will be based on the laboratory experiments and will cover the chemistry, procedure, calculations, and conclusions of the experiment. Critical thinking will be required! The format and times for each test will be given.

Notebooks will be checked during lab at which time a maximum of 3 points will be awarded for a properly prepared notebook with properly recorded data (See the attached page for laboratory notebook guidelines.).
Lab Assignment due dates will be specified when the assignment is given. There will be a 10% deduction for late assignments. **Late assignments will only be accepted for up to one lab meeting late.** The lowest assignment score will be dropped.

Prelaboratory quizzes will be given DURING THE FIRST 5 MINUTES of the lab lecture and will be open notebook. The quizzes will be on the experiment to be performed that day. The purpose of these is to persuade students to prepare their notebook and to arrive on time. Questions that might be asked include: Defining terms that apply to the experiment. What measurements will you be making? What chemicals and in what amounts will be used? What equipment will be used? What chemical reactions will be studied? What special safety precautions need to be taken? etc... NO MAKE-UP quizzes will be given, but the lowest prelab quiz score will be dropped.

The subjective lab grade is my evaluation of you in lab. It will be based upon whether you are prepared for lab, follow instructions (written and verbal), follow safety rules, wear your safety glasses **without being reminded**, clean up after yourself, etc...
The Laboratory Notebook (5x5 Quad Ruled)

Medicine, dentistry, pharmacy, engineering, biology, physics, chemistry and a large number of other fields require perceptive observations and accurate data recording. The chemistry laboratory provides a good opportunity for this training and practice. A laboratory notebook is required, and it will be brought to every laboratory session. A few pages for the Table of Contents should be set up at the beginning of the notebook and should be kept up to date for easy reference. Each page in the notebook should be numbered and each experiment should be dated.

**NO PENCIL! POINTS WILL BE DEDUCTED FOR THE USE OF PENCIL IN LAB! DO NOT PREPARE YOUR NOTEBOOK OR RECORD DATA IN PENCIL! RECORD ALL DATA IN PEN IN YOUR NOTEBOOK, NOT ON THE LAB REPORT SHEETS! POINTS WILL BE DEDUCTED IF YOU DO NOT FOLLOW THIS PROCEDURE!**

**Notebook Preparation**

Prepare your notebook PRIOR to the start of lab lecture with items 1 and 2 given below. If you prepare your notebook in advance the lab will go much more smoothly for you.

For each experiment, the following should be included in your notebook:

1. One the first page, a left-hand page, include the following:
   - A specific title.
   - If applicable, the name of your lab partner(s) recorded at the top of the first page of the experiment.
   - A briefly but clearly stated objective.
   - Applicable background information including definitions, chemical equations, mathematical formulas, etc.

2. Beginning on the right-hand page and continuing until complete, enter a precise and concise outline of the procedure.
   - Use a straight edge and divide each procedural page into a 2/3 and 1/3 portion.
   - Written procedures should be given in such a way that they could be repeated by someone else with a reasonable knowledge of lab procedure. (A student in your chemistry class should be able to follow them.)
   - An outline gives the basic steps in the experiment. The purpose of each step should be understood. Any changes made to the original procedure must be noted.

3. After the procedural page(s) begin your data pages, although for some experiments you will find that all of the data will be recorded in the procedural pages, alongside the procedure. Data pages will often include tables. Keep in mind that:
   - Data is a clear and complete record of observations and measurements. There are two types of data:
     - (a) Quantitative measurements, e.g. The dog weighs 100 pounds. (includes units)
     - (b) Qualitative observations, e.g. The dog is large and is colored tan with blue spots.
   - All data should be recorded in an orderly manner with captions, and data tables should have titles and appropriate headings. Remember to include units and to record data to the proper number of significant figures.
   - The original data are to be recorded directly and legibly in permanent ink.
   - If an error is made, a single line is drawn through the error and the supposedly correct new value is written above, below or next to the original entry. Do NOT use pencil, correction fluid or erasers.

4. After the data page(s) comes the data analysis and calculations pages. **Only these can be done in pencil.**
   - Any calculations asked for should be clearly presented with proper units and significant figures. A complete set up is required for at least one trial. For other trials the answer alone is acceptable.
   - Computer generated graphs can be taped into the notebook where appropriate.
   - A final entry giving the relevant conclusions and comparisons to accepted values (% error) should be included.
   - Answers to any questions given in the laboratory report may be included for your reference.
Items number 1 and 2 will be covered on the prelab quizzes. Items 1-3 above will be checked by your instructor when checking your notebook at the end of the lab period.

NOTE: The title, purpose, any applicable background information and procedure for each experiment must be entered into your notebook by you. You are not allowed to “cut and paste” this information from the lab packet. However, you may cut and paste figures, diagrams, tables for recording data, instructions for using the LabPro system and follow-up questions from the lab packet into your notebook.

Some tips on preparing your notebook:

1. Make sure you start on a left-hand page with the title.
2. Leave 1/3 of the page blank on the procedure pages for data entry.
3. **Make sure all chemicals needed are listed with the necessary concentrations.**
4. What glassware to be used can usually be streamlined in the procedure. Specifying the size of a test tube or beaker is often not necessary.
5. For the procedure DO NOT INCLUDE ANY OBVIOUS “HOW TO” STEPS. ONLY INCLUDE “WHAT TO DO” STEPS. For example, if the procedure calls for preparation of 25 mL of 0.050 M NaOH solution by dilution of 0.10 M NaOH do not include the steps involved to prepare the pipet (i.e. washing, rinsing with solution to be pipeted). Your notebook simple needs to read:
   “Prepare 25 mL of a 0.050 M NaOH solution by dilution from a 0.10 M stock solution.”
   For this example, you should also record the volume of the 0.10 M solution used.
6. **OMIT ALL REFERENCES TO SPECIFIC LABPRO PROCEDURES.** The LabPro Quick Start Guide is always available as a reference. Simply state what to do. For example, “Calibrate the pH sensor using pH 4 and 10 buffers.” Would be an adequate step for using pH sensors.
FOOTHILL COLLEGE
Department of Chemistry Laboratory Policies

Making up a Missed Laboratory
1) Missed labs generally cannot be made-up. Since lab lecture usually covers an outline of the safety concerns for that lab, the department feels students who have missed the lab lecture are a safety risk to themselves and others in the laboratory.
2) A student is allowed to miss one lab a quarter without penalty.

Short List of Safety Rules

Failure to follow established safety procedures will result in dismissal from the course.
1) Read the experiment before coming to the laboratory.
2) Always follow the printed and verbal instructions given for the experiment.
3) Use common sense when working with instruments and chemicals.
4) All unused chemicals and the products of an experiment must be disposed of as indicated by the experimental procedure or by your instructor. Never throw chemicals in the trash or pour them down the sink unless specifically indicated by your instructor.
5) Know how to get help in case of an accident. (The stockroom has the nearest phone, dial 7911.)
6) Wear splash-proof goggles or splash-proof glasses always. (Available at the Foothill bookstore.)
7) No eating, drinking, chewing gum, or application of cosmetics is allowed in the laboratory.
8) Know the location and operation of all emergency safety equipment in the laboratory.
9) Do only the experiment assigned by your laboratory instructor.
10) Immediately report all accidents and chemical spills to your laboratory instructor, no matter how minor.
11) Read labels on reagent bottles carefully before use. Learn of any hazards associated with the reagents.
12) Wear clothing suitable for laboratory work.
13) Avoid mouth contact with all objects in the laboratory.
14) Do not smell chemicals directly.
15) Keep the laboratory clean and free of unnecessary objects. Store your book bags and backpacks on the empty shelves in the lab, not in the walkways.
16) Only use equipment that is in good condition.
17) Avoid touching hot objects.
18) Immature behavior has no place in the laboratory.
19) Use detergent or soap to wash your hands before you leave the laboratory.

Checking In and Out of Your Drawer

Checking-in
1) Obtain a key, name slip and equipment list from your instructor. Check the condition of the equipment in your drawer. Examine the glassware carefully. Replace any broken or cracked items with new ones from the stockroom. Please specify to the stockroom staff the size and number of items you need. After you check-in, you are responsible for the equipment and will have to pay for any missing or broken items.
2) After you have finished checking-in, complete the name slip, sign the equipment list, and then give both sheets to your instructor.
3) After you finish working in lab lock your drawer and return your key to the keyboard.
4) A $20.00 security deposit is required. Please make a check payable to “FOOTHILL COLLEGE” for $20.00. It will be returned when you check-out of your drawer. Also write the chemistry course and drawer number on the bottom left corner of the check. On the back of the check write “For deposit only”.

Checking-out
1) All students are required to check out of their lab drawer during their regularly scheduled check-out time in the last week of classes. You will not be checked out of your drawer at any other time. Only your instructor can perform a lab drawer check-out, the stockroom personnel are not available for this purpose.
2) If you drop the class, you must come during a regularly scheduled lab time to have your instructor check you out of your drawer. You will not be checked out of your drawer at any other time. Only your instructor can perform a lab drawer check-out, the stockroom personnel are not available for this purpose.
3) If you fail to check-out of your drawer as described above then at the end of the term you will forfeit your $20.00 security deposit.