Chemistry 1B: Chemistry Laboratory

Lab:	MW	7:30PM – 10:20 PM	SC2204
Lecture:	MW	6:00PM – 7:15 PM	SC2204

Instructor: Lucas Cantin **E-mail:** cantinlucas@fhda.edu
Office Hours: Tue: 6:00-7:00 PM **Office:** SC 1200 office area

Class website: www.dropbox.com/sh/u0ls6681ql27rg3/AABqj0mrIWnzW99kfY5N4VrKa?dl=0

Lab Materials (Required):

1. **Microscale General Chemistry Laboratory, 2008 De Anza ed:** Szafran, Singh, Pike.
2. **Carbonless copy Lab notebook:** 100 page carbonless copy spiral bound notebook. ISBN: 1429224541
3. **A Scientific Calculator**
4. OSHA-approved Safety Goggles (Indirect Vent, Z87)
5. Disposable purple nitrile gloves *(optional)* – save your skin and your nails!
6. Knee length lab coat or lab apron (*optional*) – functional and stylish!
7. A stapler. (*optional*) apparently the stapler in this room doesn't work well.

CAREFULLY read the attached DeAnza Chemistry Department laboratory policies and safety and housekeeping rules.

You must complete and turn in the Student Contract (provided by instructor) by the second lab meeting. You will not be allowed to attend lab until the Contract is signed and turned in.

LAB POLICIES:

LABORATORY CHECK-IN

Locker check-in will take place the first day of lab. It is your responsibility to make sure that all glassware is present and unbroken at the time you check in. If at any point after the first day of lab you need to replace an item in your locker, your student account will get charged for it. *If you drop this course, then you must arrange to **check-out your locker with your instructor during your regularly scheduled lab period**.* The stockroom technician or other instructors WILL NOT check-out lockers for any students. **Any person who has not checked out by the end of the last scheduled lab period for the quarter will have an administrative fee added to their student account and a hold put on their registration.**

LABORATORY PROCEDURES AND 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 and procedure, the chemistry involved and *have prepared your laboratory notebook for the experiment prior to the start of lab*. I ask that all students do a conscientious and thorough job of cleaning up after themselves, whether it is in their own work area in the lab, or shared areas such as the chemical supply table and balance room.

LABORATORY SAFETY

Laboratory safety is an everyday assignment. ***Being safe in the lab is a top priority.*** The importance of safety in the laboratory will be reviewed the first day of lab. *Any unsafe behavior, intentional or not, will be noted and may be cause for dismissal from the class*.

For your protection, **safety goggles** with indirect ventilation and an ANSI minimum rating of Z87 **must be worn AT ALL TIMES** in the laboratory. **ONE warning** will be issued to any student that is observed wearing their goggles on their forehead, hanging them around their neck, etc... instead of wearing over their eyes. If the **warning is disregarded, expulsion** from the lab and a zero on the assignment may result. A student can also lose safe points for unsafe behavior. These points can come from the 5% subjective grade.

LABORATORY LECTURE

The beginning of each laboratory session is designated as a laboratory lecture period for which you **must be on time** in order to perform the scheduled experiment. The instructor will use this lecture period to outline important details of the procedure, overview theory and calculations, and to emphasize safety hazards and proper chemical disposal. *If you are more than **10 minutes** late for lab lecture, you will not be allowed to do the experiment for that day*.

ATTENDANCE

Attendance is required at all scheduled laboratory sessions. NEVER plan on missing a lab. *You will receive a zero on the second lab you miss and will fail the course on the third*. These absences include those in which you arrive too late for lab lecture and are thus not allowed to complete the experiment. I may allow for emergencies and other complications in life.

Additionally, do not plan on leaving lab early. Labs will regularly take the total amount of time allotted.

LAB POLICIES (CONTINUED):

CHEMICAL DISPOSAL

As a concern for the environment and to follow county, state and federal law, proper chemical disposal is essential. *Students who do not comply with directed procedures may be expelled from the lab or failed in the course for repeated offenses*. Check with the instructor if you have any questions.

LAB REPORTS

All lab reports must be completed and turned in to receive a passing grade in this class. **Using another student's data or making up data is plagiarism and data falsification and will result in a zero for the assignment and referral to the dean**. In cases where a student was unable to complete a lab, the instructor may direct you to use another's data in order to complete follow up quests at his discretion. The source of your data must always be cited in lab reports.

LATE ASSIGNMENTS

Due dates for assignments are listed on the class schedule. Late assignments will lose 20% of their value per period missed. Assignments in excess of 2 periods late will be graded as zeros
(**All Labs must still be turned in to receive course credit**).
It is the student's responsibility to know when labs are due based on the provided class schedule. Labs are always due 2 lab periods (usually 1 week) after the lab session in which they are completed.

EXCUSED ABSENCE

Every student gets one excused absence. To reflect this, your lowest pre-lab, data page, and lab report are dropped at the end of the quarter. Missing a 2nd lab will result on a score of zero on that lab. **Missing a third will result in failing the course.**

Lab Score Breakdown (comprises 30% of final class grade)

Pre-Lab Assignments (25%): Lab notebooks will be collected at the beginning of lab lecture and pre-lab assignments will be checked off before the start of lab. Pre-lab assignments should include a title, purpose/objectives, short introduction (~1-2 paragraphs) to the experiment and a numbered procedure written in your own words. Late pre-lab assignments are not accepted for credit, but must be turned in before you are allowed to start the lab. See the Notebook Guide for formatting and style tips. Prelab and data pages are collected at the end of lab **before you leave.**

Data Pages: You should then turn in the copy of your data page (along with your pre-lab) before leaving lab. **Students that fail to turn in their data pages will not get credit for the experiment.** Data pages will be graded based on proper set up and format, complete recording of data to the correct number of significant figures, and neatness and legibility. You may, at your option, turn in your original copy of the data and keep the copy if legibility of the copy is an issue. See the Notebook Guide for formatting and style tips.

Laboratory Assignments/Reports (75%): Laboratory reports are usually due two class session after the completion of the lab, with the exception of the final few labs, as specified in the class schedule. Please see the Lab Report guide for tips on this as well. *For some experiments you may be collecting and sharing data with a partner, however you must do your own calculations and formulate your own conclusions for each experiment.* **If students are found to have copied from one another, points will be deducted from the grade or a grade of zero will be given for ALL students involved!** The laboratory assignments will be collected **BEFORE** the start of the laboratory lecture on its due date.

Chem 1ABC Laboratory
De Anza College

How to Keep a Lab Notebook

Notebook Rules

1. Lab notebooks are bound (pages tied and glued together so that they are not easily removed. They are also numbered on every page, so again it is difficult to add or remove pages without this being obvious.

2. All notebooks records are kept in ink. **Mistakes in a notebook should be lined out with a single line, never covered with Whiteout or similar products, nor scribbled over to obscure the original notation(s)**. This generates a permanent non-changeable record of the work done. This is crucial! If you ever work in a laboratory, you must NEVER erase, whiteout, cover over, or remove any mistakes or data. If you did so, this would be classified as data falsification and you could be fired, as well as face fines and criminal prosecution.

3. All notebook pages must be dated and should also have the title of the experiment being carried out on it.

4. All notebooks should have a table of contents for the work done. The traditional place for a table of contents is in the front of the book. Many notebooks will include a space for a table of contents. If yours doesn't, **leave the first 3 pages blank** and construct you own.

5. Ideally, all parts of a lab are written directly into the notebook. In this class however, I will not be requiring you to attach all your graphs and conclusions to your notebook. Some of your work may be done on separate paper and turned in as your final report. Be sure to refer to the next page in order to ensure that you have the right sections in your notebook. All your data must be recorded in your notebook.

> **If you record your data into the manual or on a piece of paper, THIS is your original data and it MUST be taped or glued into your lab notebook. Although you may recopy your data in your notebook in a neat table, your ORIGINAL data must also be there!**

6. For every experiment, in addition to a title, there should also be a "Purpose", a short background introduction, a Chemicals and Equipment section, a Safety and Waste section, a Procedures section, an Observation/Data Collection section, and a Data Analysis section. Formal reports will also include a Discussion/Error Section and a Conclusions section. The following page shows the required order for these sections in the notebook.

7. The following sections must be included in your notebook: Title, Purpose, Chemical/Safety Equipment, All Pre-Lab work, Procedure, Data, and Calculations. All other sections, including Graphs and Tables, Discussion/Errors, Conclusion and Post-lab Questions may be done on separate pages.

Order of Sections for a Lab Notebook

Title	Title goes on each page of the report
Purpose	This is a sentence or two on why you are conducting the lab: what are the objectives. (*What you want to do/prove*) **This is part of the pre-lab write up**.
Introduction/Background	This is a brief explanation of the theory and practice the lab is based on. It demonstrates your understanding of what we are doing and what we will learn from it. It should be 1-2 paragraphs long. *(What are you basing this experiment on)* **This is part of the pre-lab write up**
Chemicals/Safety/Equipment	All equipment & chemicals are listed here with basic chemical safety info (including ***basic hazard info*** like is it flammable, corrosive, etc; ***handling and safety precautions*** like use only in the hood or keep away from open flames; and ***emergency/first aid info***) on **all** the chemicals being used. Read the procedure to get all the chemicals & equipment used. This can be a table or a paragraph. (*What you need to think about as you're doing the experiment*) **This is part of the pre-lab write up**.
Pre-lab Calculations	Any assigned pre-lab calculations are to be completed in your notebook prior to beginning any lab. This section is not common but do check! **This is part of the pre-lab write up**.
Procedure	Reference the procedure in your lab notebook and then write down any changes to the procedure in enough detail so others reading the notebook could repeat the lab with the changes. (What *you did*.) **This is part of the pre-lab write up**.
Data Tables	Data, including masses, times, observations, spectra, temperature, color changes, absorbance readings, etc. go here. Be sure to include units of measurement and significant figures and any required experimental conditions (time, temp.). (*What you observed.*) **Your pre-set data tables are part of the pre-lab write up.**
Data Analysis (Calculations)	This is where you perform calculations and attach graphs. Show all calculations and equations. Some labs require you to do some data analysis as you collect the data, but you still need to have a separate Data Analysis Section. Data Analysis may be recopied as it is not raw data. (*What you can get out of your data*)
Discussion/Errors	This is where you interpret your data and data analysis, compare experimental data to known results, and explain errors and possible errors. (*What your data means*)
Conclusion	This is a summary of the experiment and its objective, your important data, important data analysis results, your data analysis interpretation, comparison to known values, and errors. Remember to put numbers here as well as explanations on errors. *Important: The Conclusion is a rewording or restatement of everything which is already found in your report (except perhaps a personal opinion on how you could improve the lab to obtain better results).* (*What you accomplished*)
Post Lab Questions	If there are any post lab questions, they get put here.

CARBON COPIES OF THE PRELAB WORK WILL BE CHECED AT THE START OF LAB LECTURE. IF YOU HAVE NOT COMPLETED THIS WORK, YOU WILL BE EXCUSED FROM LAB UNTIL YOU DO COMPLETE IT. ALWAYS PREPARE BEFORE THE LAB! BEING ON TIME IS WORTH POINTS!

ALL DATA WILL BE CHECKED AT THE END OF THE LAB AND INITIALED BY THE LAB INSTRUCTOR. DO NOT LEAVE THE LAB WITHOUT GETTING YOUR DATA SIGNED! YOUR PRE-LAB AND DATA PAGES ARE DUE BEFORE YOU LEAVE LAB.

Some tips on preparing your notebook:

1. Make sure your name and the experiment title are on each page.
2. Make sure your data collection pages are neat and your records legible.
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 pipetted). 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 and the type of glassware used (i.e. pipette, volumetric flask, etc.).
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.

CHECK LIST FOR COMPLETED LABORATORY ASSIGNMENTS/REPORTS

1. Write your name on the first page. **All loose papers must be stapled together!** (No paper clips, no bent corners, etc.) Loose papers will not be accepted and if you do turn them in, points will be deducted! Turn-in only what is asked for, no extra pages.

2. The lab report or assignment should be neat. Lab reports should be typed, other worksheets may be completed neatly in pencil or pen. Mistakes during data collection should be crossed out with a single line (not erased!). All writing must be legible. On graphs, circle the points so they can be seen. **INCLUDE UNITS on all data, graphs, calculations, etc…!**

3. Unless otherwise notified by your instructor, all exercises and problems in a lab report or assignment must be completed for full credit. If you are having trouble solving a problem, **see your instructor for help**. Do not copy another students work, both you and the other student will be penalized!

4. **In all calculations** show the **set-up with units**! If multiple trials are performed, you only need to show the set-up for the first trial.

5. All data must be recorded to the precision of the instrument. If you are unsure of the precision ask your instructor or refer the Measurements Lab (completed in class). For example, a buret reading where the meniscus falls exactly on 15 mL is recorded as 15.00 mL not 15 mL. The trailing zeros in the 15.00 mL reading are significant!

6. In your calculations use the rules of significant figures to determine how many significant figures your answer should contain. Review the rules for significant figures! Points will be deducted for every significant figure error.

Rules for Safe and Efficient Chemistry Laboratory Operations

Safety Rules:

1. *Prepare for each experiment by reading all of the directions before lab starts.*
2. *Locate the Safety Equipment.* Know the locations of the eye wash, safety shower, fire extinguishers, fire blankets, first aid kit, fume hoods, telephone and all exits that are to be used in an emergency. Your laboratory instructor will describe the use of the safety equipment.
3. *Protect your eyes.* Wear approved eye protection at all times. Your laboratory instructor will inform you which of these you must have. Goggles provide maximum safety. Prescription glasses, if you need them, must be worn under approved eye protection. Contact lenses should not be worn in the laboratory because fumes may accumulate under the lenses and injure your eyes and the lenses make it difficult to flush chemicals from your eyes.
4. *Tie long hair back.* This precaution will keep your hair out of burner flames and harmful chemicals.
5. *Do not wear clothing with loose, flowing sleeves.* This precaution will keep your sleeves out of burner flames and harmful chemicals.
6. *Wear shoes that cover all of your feet.* Broken glass on the laboratory floor and spilled chemical reagents are all too common. Shoes that cover your feet completely will protect them from broken glass and chemical splashes. The best types of shoes are closed-toe made out of leather.
7. *Wear clothes that cover your torso and your legs to the knees.* Clothing will give your body needed protection. Good clothing can be protected with a lab apron or coat.
8. *Do not eat or drink in the laboratory.*
9. *Do not taste any chemical reagent.*
10. *Do not smell chemical reagents directly.* When you are instructed to smell a chemical, do so by gently wafting the vapors toward your face. Do not inhale deeply.
11. *Do not pipette solutions by mouth.* Use a rubber suction bulb to fill the pipette.
12. *Do not work with flammable liquids near a flame.*
13. *Do not engage in games or horseplay in the laboratory.* Never run in the laboratory.
14. *Do not attempt unauthorized experiments in the laboratory.*
15. *Do not work in the laboratory in the absence of your instructor or his or her authorized representative.*
16. *Use a fume hood when required.*
17. *Handle glass tubing and thermometers carefully.* When inserting glass tubing or thermometers through a rubber stopper, always hold the glass close to the stopper and use a lubricant such as glycerin to help the glass slide through the stopper. Do not continue to try to force glass through a stubborn stopper, get a new stopper and/or get help. When inserting a pipette into a pipette bulb, hold the pipette near the bulb and GENTLY insert the pipette.
18. *When diluting, never pour water into concentrated reagents.* Always pour the reagent into the water.
19. *If you spill a chemical reagent on yourself, immediately flood the exposed area with water and then summon the laboratory instructor. Inform the instructor immediately about any other accidents or spills.*
20. *Be aware of your neighbors. Are they obeying the safety rules?* A neighbor's accident may injure you.
21. *Avoid touching your face and rubbing your eyes while in the laboratory.* If you must do so, first wash your hands.
22. *Wash your hands before leaving the laboratory.*
23. *Never heat a closed container.* Pressure build up can cause the container to explode.
24. *Assume any chemical is hazardous if you are unsure.*
25. *Do not violate any other safety rule issued by your laboratory instructor.*

Housekeeping Rules:

1. *Clean up broken glass immediately with a broom and dustpan. Do not use your hands.* Dispose of broken glass in the special container that is provided, never in a regular trash can.
2. *Chemical spills must be cleaned up immediately.* Immediately notify your instructor who will advise you how to clean it up and/or assist you. Dispose of the collected contaminated chemical properly as instructed.
3. *Do not pour any chemical down into the sink or in the trash without authorization.* Clearly labeled disposal bottles will be provided when needed.
4. *Take containers to the stock of chemical reagents.* Do not bring stock chemicals to your laboratory bench.
5. *Read the label on a reagent bottle carefully.* Is it the correct chemical? Is it the correct concentration?
6. *Do not insert your own pipette, medicine dropper or spatula into a stock bottle.*
7. *Use special care with stoppers or tops of stock bottles.* Do not allow them to pick up contamination. Your instructor will provide additional instructions for handling the stoppers or tops found in your laboratory.
8. *Always replace the stopper or top of a stock bottle when you are finished taking some of the reagent.* Make sure that you put the stopper or top back onto the correct bottle.
9. *When pouring liquid from bottles, hold the bottle with the label against the palm of your hand so that the liquid is poured from the side opposite the label.* If any liquid runs down the outside of the label, immediately wipe off the liquid.
10. *Do not take any more of a reagent than is required.* Many of the chemicals used in the laboratory, including deionized water, are costly.
11. *Never return any unused reagent to a stock bottle.* If you take too much of a chemical, dispose of it as directed by your instructor or offer it to a classmate who needs it.
12. *Set up your glassware and apparatus away from the edge of your laboratory bench.*
13. *Thoroughly clean the area around your laboratory bench and the top of your laboratory bench before leaving lab.*
14. *Keep shared areas of the laboratory clean.* This includes areas such as the balance room and where the stock bottles are stored. It is especially important to keep the balances clean and free of chemical spills.
15. *Keep your laboratory equipment clean.* Good results depend on clean equipment.
16. *If a piece of equipment containing mercury is broken, inform your laboratory instructor immediately.* Keep the area blocked off to avoid scattering the mercury.
17. *Follow any other housekeeping rules given by your laboratory instructor.*

Chemistry 1B: General Chemistry

Lecture:	MW	6:00PM –	7:15 PM	SC2204
Lab:	MW	7:30PM –	10:20 PM	SC2204

Instructor: Lucas Cantin **E-mail:** cantinlucas@fhda.edu
Office Hours: Tue: 6:00-7:00 PM **Office:** SC 1200 office area
Class website: www.dropbox.com/sh/u0ls6681ql27rg3/AABqj0mrIWnzW99kfY5N4VrKa?dl=0

This course syllabus is a contract:
One purpose of this syllabus is to provide you with the guiding principles upon which the class runs. Another purpose is to make sure that you have, at your fingertips, answers to common questions that might arise. This document is available at all times on the class website. Make sure you read it in its entirety before you ask me any questions about the course schedule, requirements, grading, etc… It is also a contract between you the student, and I, the instructor of record. Make sure that you understand its contents fully, especially the parts that pertain to testing and the computation of your grade, because so long as you remain enrolled in the course, you are implicitly agreeing to abide by these terms.

Course Description: Chemistry 1B is the second quarter of a year-long general chemistry class for science and engineering majors. The course covers the physical aspects of chemistry with a heavy emphasis on problem solving. Topics: intermolecular forces, liquids and solids, solutions, colligative properties, kinetics, equilibrium theory, acid-base chemistry and equilibrium, topics in aqueous equilibria, and spontaneity and entropy.

Prerequisites: A "C" or better in Chem 1A

Course Materials (Required):
1. **Text Book:** *Chemistry: The Molecular Nature of Matter and Change, 7e,* by Silberberg ISBN-13: 978-0073511177
2. Microscale General Chemistry Laboratory, 2008; De Anza edition, Szafran, Pike, Foster (John Wiley & Sons: 2008, ISBN 0-471-77762-5)
3. A scientific calculator that has at least log and exponential functions is required (~ $12). Graphing is not needed.
4. 8.5 x 11 permanently bound **laboratory notebook with carbon copies**.
5. OSHA approved **laboratory safety goggles**. Other types of goggles will not be permitted.
6. A **combination** lock for your laboratory locker.
7. **Latex or Nitrile Gloves** available from the bookstore.

Course Materials (Optional):
1. Student Solutions Manual and Student Study Guide for lecture text. Silberberg.
2. Lab Coat
3. Inexpensive flash drive memory to store data from lab

Resources

Tutoring: De Anza's tutorial center is in L47. This and many other campus services can be found as part of the student success center: http://www.deanza.edu/studentsuccess

Disability Support Program and Services: DSPS can help you get the right tools to succeed. Their website is http://www.deanza.edu/dsps/

Grading Scheme:	**Percentage**
Lab Final	10
In Class Quizzes	10
Laboratory Work	20
Chapter Exams (2)	30
Final Exam	20
Homework	5
Subjective Lab and Lecture	5
Total	**100%**

Homework (5%): A homework schedule is listed. Show all work and box your answers like you should do for all tests and assignments.

Quizzes (10%): There will be 1 to 2 quizzes per week, given at the beginning of the lecture period. There will never be a quiz on an exam day. Quizzes will be distributed at the beginning of class and you will be given 5 minutes to complete them. Students arriving after the quiz period will NOT have an opportunity to make up the quiz. Extra quizzes will allow for the lowest quiz scores will be dropped at the end of the quarter.

Laboratory Work (25%): You will be expected to participate in lab, complete lab worksheets and reports, and pass lab quizzes. More details on these items can be found on the laboratory handout.

Chapter Exams (30%): There will be 2 chapter exams worth 15% of your grade each. Exams will be a combination of any of the following: multiple choice, short answer/calculation problems, and vocabulary questions. Early and late exams are not administered. Missing an exam **will result in a zero** for that exam without proof of an excused absence (doctor's note, police report, etc…). Lab final has the same policy.

Final Exam (20%): The Final Exam is cumulative and will have the same format as the chapter exams. The exam will be given **Wednesday, June 24th from 6:15 PM – 8:15 PM.** If you cannot make this time, you should not enroll in this class.

Subjective Grade (5%): A subjective evaluation will be assessed by your instructor at the end of the quarter to reward you for: your good and punctual attendance; active participation, preparedness for the lecture and laboratory, ability to follow written and verbal instructions, adherence to the safety rules, cleanliness practices, and overall respect for the laboratory through the proper care and use of all laboratory apparatus and instruments. These are NOT free points and must be earned.

Special Note: If your average percentage is failing (<55%) in any **ONE** or more of the following portions of the course, you will not receive a passing grade:
exams or lab reports/assignments.

Class Policies.

A. **Time Requirement:** This class includes appx. 3 hours of lecture and appx. 6 hours of lab per week. In order to receive a "C" or better grade, you should allow 10-20 hours of studying, reading, and preparing outside of class **PER WEEK**. Help yourself to do your best by making time to keep up with the reading and homework. *If this time commitment is not possible given your current situation, please consider taking this class at a later date when you do have more time available.*

B. **Lecture Attendance:** Attendance is a critical component of the learning process, and the lecture will help clarify material that is in your text. Material may be covered in lecture that does not appear in your text. Learning Chemistry effectively depends on building up from a base of knowledge. If you do not set a firm foundation, you will not be able to build your understanding of the field effectively.

C. **Class Behavior:** Be ready to start class at the scheduled time. Please arrive on time and plan on staying the entire session as late arrivals and early departures distract everyone. If you are unavoidably late, please enter quietly and find your seat as quickly and quietly. Please do not disrupt class with irrelevant conversations, either in the form of inappropriate comments or private conversations. I would always prefer you show up a little late as opposed to skipping the class entirely.

D. **Please turn OFF your cell phone when you enter the class or lab**. You may **NOT** take calls or texts during either, except for emergencies. Students caught abusing this rule may be docked points or expelled from class or lab.

E. **Academic Dishonesty:** Cheating or plagiarizing another student's work, in whole or part, will result in a zero for the assignment, a referral to the dean and my immense displeasure. Any case where you attempt to gain unfair advantage over other students or attempt to pass off another's work as your own **is cheating**. Please see me if you have any questions. You implicitly agree to abide by the Honor Code as a condition of enrollment in this class: http://www.deanza.edu/studenthandbook/academic-integrity.html

F. **Grading:** This class is not graded on a curve. Grade cut offs are as follows:
A+ (97), A (93), A- (90), B+ (87), B (83), B- (80), C+ (76), C (69),
D+ (65), D (60), D- (56), F (56-0)

G. **Extra Credit:** Extra credit assignments are not offered in this class on an individual basis. It is unfair to allow some students to improve their grade while not allowing others that same opportunity. Some extra credit problems may appear at the end of exams and in homework.

H. **Dropping the Class:** If you wish to drop the class after the first 2 weeks, it is your responsibility to do so. If you fail to drop the class you will be assigned a grade in keeping with your submitted work.

I. **Questions/Help:** I am available to answer questions during office hours, by email, or by appointment. Please feel free to contact me with any problems or concerns that you have. Also remember that your fellow students are great resources.

Attendance Note

You are responsible for all the material covered in this course, and it is expected that you attend and participate in all of the lecture and laboratory sessions. *If you must be absent, then it is in your best interest to contact your instructor as soon as possible (by email) in order to find out what work you have missed.* **Due to the high number of students wishing to enroll in this class, any unjustified absences during the **first two days of class **will result in you being dropped.**

Tips for Success

- **Come to class having read the assigned chapter** and be ready with questions about the concepts you didn't understand.
- In case you didn't read the first one, really, come to class with the assigned chapter already read. I cannot stress how big a difference this will make for you.
- **Take notes during class and reread your notes before the next class**. If something is still unclear, write down your question so you can ask about it during the next class or in office hours.
- **Work every day.** The longer the time that passes between doing chemistry problems, the more knowledge you have to rebuild. Do some homework problems and some problems from the book every day as this will help you understand where you need help, and it will help prepare you for the exams. Schedule some time each day to work on chemistry. Treat this subject like a foreign language. Use it or lose it.
- **Do the suggested chapter problems in the book**, particularly for concepts you're having trouble with.
- **Don't try to memorize EVERYTHING.** This is a common trap that many students fall into. While there are certain topics that must be committed to memory, strive to develop an intuitive understanding of the underlying framework of the material. Once you have that you will often be able to derive answers from a much smaller pool of "memorized" data.
- **Join a study group**, exchange phone numbers of classmates whom you can call for help. In the group, take time to present concepts to one another. The BEST way to solidify a topic in your mind is to have to teach it to someone else.
- **Don't wait** until the night before to finish that lab report or homework assignment. You'll get more out of it (and do better) if you give yourself the time to understand the concepts and ask questions when you get stuck.
- Start studying for the exams **at least a week before**. Cramming for an exam is like playing Russian Roulette! Cramming is superficial knowledge only, and when you are nervous, superficial knowledge is very unreliable.
- Work through old quizzes and homework problems before exams.
- **Give yourself TIME!** Plan on spending at least 2 hours studying outside of class for each hour we spend together in class or lab lecture. Do this every week, not just the week before the exam. Start early and it will be much easier later.
- If you consider yourself a poor test-taker, then you should complete and turn in all of the homework and labs on time in order to pass the class. Also, utilize any practice exams or chapter reviews as they contain the same types of questions which you will encounter on the exams.
- **Stay well rested and healthy.** This is always a challenge in college, but do not neglect your basic needs. Poor sleep and diet have been shown to have a temporary negative impact on I.Q. Schedule study breaks as needed to keep up your mental health as well. Sometimes a night off is the right answer. Just don't make blowing off your studying a habit.
- As you listen, take notes, read, or work problems, try to keep an open mind, be curious, and think about the implications of the concepts and problems. Chemistry makes the world around us work and understanding why the world works will <u>impress your friends at parties</u> and help you grasp the material. The more connections you can make between the material in the book and the world around you, the more sense this class will make.

Student Learning Outcomes for the General Chemistry Course of Studies

Chem 1A

1. Identify and explain trends in the periodic table.
2. Construct balanced reaction equations and illustrate principles of stoichiometry.
3. Apply the first law of thermodynamics to chemical reactions.

Chem 1B

1. Demonstrate knowledge of intermolecular forces.
2. Evaluate the principles of molecular kinetics.
3. Apply principles of chemical equilibrium to chemical reactions.
4. Apply the second and third laws of thermodynamics to chemical reactions.

Chem 1C

1. Apply the principles of equilibrium and thermodynamics to electrochemical systems.
2. Apply the principles of transition metail chemistry to predict outcomes of chemical reactions and physical properties.
3. Evaluate isotopic decay pathways.

BEFORE the beginning of Chemistry 1B, I expect students to KNOW OR BE ABLE TO DO the following:

The following metric prefixes:

mega	M	10^{6}
kilo	k	10^{3}
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}

Units:

mass-gram (g) length-meter (m) time-second (s) volume-liter (L) Density

(g/mL for liquids and solids, g/L for gases

Solution Concentration (M = moles solute/L solution)

1 mL = 1 cm^3

˚C to K conversions: K = 273.15 + ˚C or ˚C = K – 273.15

- The difference between precision and accuracy and how to calculate percent error.
- Record a measurement to the correct digit (precision) based upon the limitation of the measuring device.
- Determine the correct number of significant figures allowed in the result of a calculation.
- The basic nuclear structure of the atom (protons, neutrons and electrons).
- Locate metals and nonmetals, alkali metals, alkaline earth metals, halogens and noble gases, periods and groups, atomic numbers and atomic weights on the Periodic Table.
- The difference between ionic and covalent bonding (Be able to recognize if a substance is ionic or molecular in nature.).
- Name and write formulas for ionic compounds, binary molecular compounds and acids. You should know the names and formulas of the polyatomic ions listed on the handout provided.
- The strong acids: HCl, HI, HBr, HNO_3, $HClO_4$, $HClO_3$, H_2SO_4
- The strong soluble bases (Group 1A Hydroxides and $Ba(OH)_2$) and strong slightly soluble bases ($Ca(OH)_2$ and $Sr(OH)_2$)
- Ammonia (NH_3) is a weak base.
- Write ionization equations for strong and weak acids and bases in water.
- Selected solubility rules for ionic salts (see handout).
- Convert between mass and moles. Balance chemical equations. Perform stoichiometric calculations including those needed for titration, limiting reactant and percent yield problems. Carry out dilution calculations.
- Recognize types of chemical reactions (precipitation, acid-base and redox). Write net-ionic equations for reactions.
- Basic understanding of **gas behavior**. Be able to use the Ideal Gas Law; solving for one variable. Understand Kinetic-Molecular Theory.
- The First Law of Themodynamics and the definition of ΔH.
- Standard states for thermochemistry: 1 atm for gases, 1M for aqueous solutions, most stable form for pure substances.
- Hess' Law: $\Delta H^\circ_{rxn} = \sum \Delta H^\circ_{f\,(products)} - \sum \Delta H^\circ_{f\,(reactants)}$ (This will also be used for ΔS° and ΔG°)
- The shapes of atomic orbitals (s and p).
- Write electron configurations.
- Periodic Table: trends in atomic size, ionization energy, electron affinity and ion sizes.
- Draw Lewis structures for molecular compounds and polyatomic ions.
- Determine shapes of molecules and ideal bond angles using the VSEPR Model.
- Understand the concepts of bond polarity and dipole moments and be able to determine if a molecule is polar or nonpolar.
- Understand the Valence Bond Theory description of covalent bond formation: orbital overlap, orbital hybridization, sigma and pi bonds, single and multiple bonds.