

Chemistry 1B, General Chemistry

Chem 1B - Section 25

Lecture MTWR – **In-Person** - 2:30PM to 3:45PM – S32

Lab MTWR- **In-Person** – 11:30AM to 2:20PM – SC2204

Instructor: Dr. Chris Deming, email: demingchristopher@fhda.edu

Course Description: This class will cover the principals of chemical kinetics, intermolecular forces, gases, weak acids/bases, chemical equilibrium, and thermodynamics.

This course is divided into two separate instructional periods, the lecture and laboratory sections. The lecture portion is primarily devoted to the material discussion while the laboratory portion gives a chance for chemical experimentation. One registration code will enroll for the lecture and lab sections. Lecture and lab sections must be taken together to pass Chem 1B and will both go towards a single grade.

Course Material:

1. Lecture Text: CHEMISTRY: The Molecular Nature of Matter and Change, Silberberg and Amateis, 9e. Other editions will be essentially the same and will work great to study, but practice problems given in this syllabus correspond to the 9th edition. There are multiple options to obtain the text for this course depending on your specific needs.

a. **Option 1** – Hard copy text. This can be used and any edition. I will give homework and solutions from the 9th edition, but you will find these questions in any edition but potentially with different numbering. This is the way to go if you prefer hard copies and is a great choice if you want a quality chemistry textbook to reference in the future. If you plan to take CHEM 1C, this option may be the best, since this will be the text used (at least until fall 2023), and you will likely be able to find a cheap, used copy.

b. **Option 2** – 90 day access to an electronic text specifically for CHEM 1B. This is a great, cheap option that will give you 90 day access to an electronic text for the chapters in CHEM 1B only. This can be purchased with the ISBN: 9781307600964. This is a great option if you do not plan to take CHEM 1C.

IMPORTANT NOTE: Although they are listed as required at the de Anza bookstore, Aktiv Chemistry and Calculations in Chemistry are NOT required.

2. Lab Safety Goggles/Clothing. Proper eye protection is required for every lab. My hopes are that most of you have goggles from CHEM 1A, but if you do not, approved goggles are available at the bookstore or online. If you have others you would like to use or are looking to buy some online, please let me know, and I will

help you check if they are lab-approved. Additionally, we need to wear appropriate clothing for lab work, such as long pants and closed-toe shoes, which I will talk about more on the first day of lab

3. Lab Notebook: We will be using these notebooks for keeping our experimental data this quarter. The notebook cannot be pocket size and must be permanently bound. Other than that, the type doesn't matter. Please let me know if you are interested in using a tablet/laptop for notes, and we can discuss that possibility.

4. Scientific Calculator. Logarithm and exponential functions required. You are encouraged to bring your calculator each day to work through examples as they are presented. Phones will not be allowed for calculations during tests.

5. Camera linked to the internet – For much of your classwork, you will need to take a picture of your work and submit to CANVAS. Phones are 100% okay. Please let me know if this is an issue as soon as possible.

Class Registration. Registration limit is strictly set at 30 since we limited by the space in lab. The class will be filled based on the official roster provided by the De Anza Admissions and Records, including an official waitlist. Students on this waitlist may attend the lecture for the first week but will not be allowed to come to lab until officially enrolled. I will create a waitlist mailing list to give lecture slides and send assignments up until the registration is finalized at the end of the first week.

Resources: Academic support can be found at the Learning Resources Division <https://www.deanza.edu/learningresources/>. Information about tutoring can be found at the Math Science and Technology Resource Center <https://www.deanza.edu/studentssuccess/mstrc/>.

Academic Integrity: By enrolling in classes at De Anza College, you are agreeing to the academic integrity policy and are held to all standards. Specifics can be found at <https://www.deanza.edu/studenthandbook/academic-integrity.html>.

Cheating during an exam/quiz or copying/using work other than your own for a lab will result in a 0 for the entire assignment, regardless of what percentage of the work is from cheating. Worse than a 0 on an exam, I am required to report such incidents to the disciplinary committee, who will make a note of the incident on your transcript, which then becomes visible to 4 year colleges upon reviewing your transfer application.

Disability Service Support: De Anza is committed to supporting all students. Please contact me as soon as possible if you require special accommodations and I will be happy to do what I can to help. For more information, visit Disability Service Support at <https://www.deanza.edu/dss/>

Classroom Conduct: I want to be very clear that this class is a place where everyone can feel safe to be themselves and to learn at their own pace. It is important to me that you feel comfortable to ask questions, and I hope you all will help me create a supportive atmosphere.

Late Policy: Other than exams, all late work will be accepted. Preparing for a safe experiment is crucial, so late prelabs will lose one point for each day late.

Assignments:

Lecture Assignments	Points	Percent
Student Welcome Questionnaire	5.0	0.6
Gas Simulation Worksheet	20.0	2.5
Research Report	40.0	5.0
Quiz 1	25.0	3.1
Quiz 2	25.0	3.1
Quiz 3	25.0	3.1
Exam 1	100.0	12.5
Exam 2	100.0	12.5
Final Exam	120.0	15.0
Lecture Total	460.0	57.5

Class Total	800.0
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Grade Assignment	
Grade	Percent
A+	>97
A	97-93
A-	93-90
B+	90-87
B	87-83
B-	83-80
C+	80-76
C	76-70
D	70-60
F	<60

Laboratory Assignments	Points	Percent
Chemical Lab Safety Sheet	5.0	0.6
COVID Lab Safety Sheet	5.0	0.6
Molar Volume of a Gas Prelab	8.0	1.0
Molar Volume of a Gas Quiz	3.0	0.4
Molar Volume of a Gas Experiment	4.0	0.5
Molar Volume of a Gas Calculations	5.0	0.6
Molar Volume of a Gas Conclusion	5.0	0.6
Vapor Pressure Prelab	8.0	1.0
Vapor Pressure Quiz	3.0	0.4
Vapor Pressure Experiment	4.0	0.5
Vapor Pressure Calculations	5.0	0.6
Vapor Pressure Conclusion	5.0	0.6
Green Crystals Prelab	8.0	1.0
Green Crystals Quiz	3.0	0.4
Green Crystals Experiment	6.0	0.8
Green Crystals Calculations	10.0	1.3
Green Crystals Conclusion	5.0	0.6
Chemical Kinetics Prelab	8.0	1.0
Chemical Kinetics Quiz	3.0	0.4
Chemical Kinetics Experiment	6.0	0.8
Chemical Kinetics Formal Report	50.0	6.3
Determination of Kc Prelab	8.0	1.0
Determination of Kc Quiz	3.0	0.4
Determination of Kc Experiment	4.0	0.5
Determination of Kc Calculations	5.0	0.6
Determination of Kc Conclusion	5.0	0.6
Determination of Ka/Kb Prelab	8.0	1.0
Determination of Ka/Kb Quiz	3.0	0.4
Determination of Ka/Kb Experiment	2.0	0.3
Determination of Ka/Kb Calculations	4.0	0.5
Determination of Ka/Kb Conclusion	5.0	0.6
pKa of an Indicator Experiment	4.0	0.5
pKa of an Indicator Graph	5.0	0.6
Calcium Hydroxide Prelab	8.0	1.0
Calcium Hydroxide Quiz	3.0	0.4
Calcium Hydroxide Experiment	4.0	0.5
Calcium Hydroxide Calculations	5.0	0.6
Calcium Hydroxide Conclusion	5.0	0.6
Lab Final	100.0	12.5
Lab Total	340.0	42.5

Lecture

Lecture Description

Chemistry 1B will cover chapters 5, 12, 16, 17, 18, and 20 from the assigned textbook. All lectures will be held **in-person**, Monday-Thursday, from 2:30 PM to 3:45 PM in room S32.

The chemistry department is committed to providing safe in-person meeting spaces and has agreed upon certain safety protocols to minimize any possible spread of COVID. These protocols are expressed in the COVID Safety Agreement document and are in accordance with the current COVID safety policy of de Anza. This document is posted to CANVAS and will be emailed directly to you. You will need to read, sign, and turn the COVID safety sheet to the CANVAS assignment before coming to campus the first day (Monday 6/27) for **5 points**.

Furthermore, there is a Self-Assessment Checklist for students to perform before coming to campus each day. You should go through the checklist each time before coming to class, but do not need to turn it in. We will also discuss these documents more during the first week of lab.

My general philosophy toward lecture is that I am looking to give a deep conceptual description of the concepts as well as a thorough review of the associated mathematics. The marriage of these two independent ways of understanding is ultimate goal. This means I will spend a significant amount of time in lecture describing the atomic scale dynamics as well as going over calculations.

Below are some helpful tips that make learning much easier this quarter.

1. Review the material before attending the lecture. This could include reading the section in the textbook, reviewing the lecture slides, or even glancing at the homework. This will help you develop a stronger and more personal connection with the topics and make the presented material much easier to understand.

2. Don't only copy the words from the slides during lecture. Since I will give the lecture slides before the lecture, you will not need to copy down everything on the presentation. In fact, many of the slides are very dense with info, and it would take you too much time to copy all the words down.

Furiously copying the words on slides is not the best way to learn during a lecture and instead, writing down what I am saying and/or what you are thinking will be a much more successful method. This can be done with a tablet, printing out the slides before, or writing in a notebook using the slide numbers.

3. Complete all homework problems and all of the in-chapter reviews. Extensive practice is the best way to ensure concept mastery. The more you practice, the more comfortable you will be, and the better you will perform on exams. Beyond the minimum of the assigned problems, you are encouraged to do the in-chapter problems as well as the end of the chapter problems that were not assigned. I am serious when I saw that I sometimes use problems from the book that I didn't assign as exam problems.

4. Don't fall behind. In chemistry, each new topic will build on the previous one so it is essential to understand the topics as they are presented. Following a lecture when you do not understand the previous material is not an effective method for learning and will lead to further problems. To avoid falling behind.....

5. Get help when you need it. If you are having a difficult time with a topic, it is your responsibility to get help. There are plenty of resources, including myself, for aiding in material comprehension, but it all starts with you making an effort to get this help. You are also encouraged to find a study group.

Lecture Assignments

Student Welcome Questionnaire. In an effort to become better acquainted with you, and provide the best overall instructions possible, I have created a set of questions for you to answer, worth **5 points**. My idea is that with a strong and relationship and mutual respect, communication and thus learning will be facilitated. My hopes are that knowing some of this info will help start building this relationship. The assignment will become available the first day of class. When you click on that assignment, you will find a pdf with the questions and further instructions.

Gas Laws Worksheet. To further our understanding of gas behavior, we will use a program from PhET to simulate gases. This program is free and allows us to alter certain conditions of the gas and measure the effects. This program and the associated worksheet will be introduced in the first week, and the assignment is worth **20 points**.

Research Report. A vital part of scientific work is researching what experiments have been done and using the consequences of those studies to develop a plan to uncover new information through your own experiments. While we won't be doing any original experiments in this class, we will get practice looking for information.

The topic of the report can be anything related to chemistry, but it needs to have some connection to you. While one half of the report is a detailed description of the topic, the other half will be centered on what this topic means to you.

Topics must be approved through email since no topic can be used by more than one student. I will talk about this more and release an instruction sheet during the first week of class. The entire report is worth **40 points**.

Homework. Homework will not be turned in for credit, but will provide the practice needed for concept mastery. The list of homework problems is on page 10. These homework problems will be from the end of the each chapter and will cover calculations as well as conceptually based problems. I will also give a solution key so you can check your work.

Doing all of the listed problems is highly recommended and represents the minimum needed to practice the topics, but you are strongly encouraged to go beyond the listed problems and try other problems throughout the book. Test questions will be similar to homework questions, so it is important to practice each problem.

Lecture Quizzes. Three quizzes will be given between the exams to make sure everyone is keeping up with the material throughout the quarter. The quizzes are worth **25 points** each, will take about 15 minutes, and will be given at the beginning of the lecture period, so late attendance may result in missing time for the quiz. The day of the quizzes are given on page 9 and reminders will be sent through CANVAS messaging.

Lecture Exams. There will be two lecture exams to test comprehension throughout the quarter. Exams will cover material from lectures, homework, and book chapters. If you are having difficulty completing the homework questions for that chapter, you are urged to get help *before* taking the test. Questions will range from easy to difficult and may require solving problems that have not been explicitly demonstrated before.

Each exam is worth **100 points**, and the dates are given in on page 9. No late or early exams will be administered. If you feel the grading of any exam is incorrect, please let me know and I will be happy to talk about it with you. I will release a key after the exam, and I am very open to hearing what you have to say about the grading, but you must do so within **one week** of the day the exam key is released.

Lecture Final. The lecture final is worth **120 points** and will cover only the chapters that were not on previous exams. The date is August 4, during the usual lecture time period.

Laboratory

Lab Description

This quarter, we will be in the lab again for some in-person experimentation. While this is exciting for many reasons, it is important to be clear about the proper precautions for hazards both old (chemical) and new (COVID), and how to complete lab assignments.

The chemical safety document can be found on the last page of the syllabus. I will go over this sheet in lab and you will read, signed, and turn it in to the CANVAS assignment before performing any experiments for **5 points**. The COVID Safety Agreement and Self-Assessment Checklist mentioned in the lecture description will also apply to all lab meetings.

What follows below are descriptions of the policies and assignments required for each experiment.

Absence Policy

Please go through the self-assessment from the provided document before you go to lab each time. If the result of the assessment is that you should stay home, please do so. While you cannot make up the experiment due to time restrictions, there will be a way for you to make up the points so you won't lose any points for staying home. We are all counting on each other to make the responsible decision and I don't want you coming to lab in fear of losing points when the self-assessment does not clear you to do so.

Lab Assignments

There will be a total of 8 labs experiments that we will perform this quarter. For each experiment, you are required to read the procedure, complete a prelab, attend the lab introduction at the beginning of the lab period, perform the procedure, answer the follow-up questions/calculations, and write a conclusion. What follows are the steps to complete an experiment and the associated assignments.

Laboratory Step 1: The first thing to do to prepare for the lab is to *read the entire experiment*. It is essential to become familiar with the experimental design and procedures before starting with the lab work, and this starts with a thorough read-through of the methods. The lab documents can be found on the De Anza chemistry website and will also be available as pdfs on CANVAS under "files".

Laboratory Step 2: Once you have familiarized yourself with the lab, the next step is to write a **prelab, worth 8 points**. There are three parts to the prelab that are equally important.

First part of the prelab is the **lab introduction**, where you will describe the goals of the experiment, introduce the scientific principles that form the basis of the study, and summarize the process by which you obtain the experimental data. This should not be a list of procedural steps, but rather 1-3 paragraphs of writing, in your own words.

The second part is a recognition of the **hazards** associated with each chemical in the procedure. This does not need to be everything on the SDS but should convey the hazards working with that chemical and the proper precautions for safe usage. The third part of the prelab is to write **tables** to hold the data you will collect.

All parts of the prelab must be completed before coming to lab. Scan/take pictures of the work and upload them to the appropriate CANVAS assignment before the start time of the lab.

Laboratory Step 3: On the first day of an experiment, at the *beginning* of the lab period, there will be a quiz to test how well the procedure has been read and understood. This means there will be a total of 7 (not one for pKa lab) lab quizzes worth **3 points** each. These will only take about 10 minutes and you can reference your prelab and lab notebook during the quiz. The dates of these can be found on page 9 and coincide with the beginning of each new experiment.

Laboratory Step 4: After the quiz, I will give an introduction at the beginning of the lab session that will typically include a discussion of the theory behind the experiment as well as a walkthrough of the harder aspects of the procedure. Missing this time will result in a loss of points and may prevent you from performing the experiment that day.

Laboratory Step 5: After performing the experiment, take a picture of your data (in your pre-made table) and load it to the appropriate assignment before leaving the lab room to receive points for doing the experiment.

Laboratory Step 6: With the collected data, you will now need to perform calculations and follow up questions, and turn in them into CANVAS for **5 points**, or **10 points for the Green Crystals lab**. Typically, there will be part of a lab period, or even an entire lab period,

dedicated to help with the calculations. The required lab calculations and follow-up questions will be available as a pdf at the beginning of each experiment under the calculation assignment for that lab and are generally due before attending the next lab session. Due dates will be listed on the canvas assignments.

Laboratory Step 7: The last task is to write a **conclusion**. This section is the most important and often the most difficult because it requires deep consideration of the experiment as a whole. The conclusion should contain at least these three sections.

The first is a summary of the experiment, including the main goal and the methods used to collect/analyze data. This part should not be more than a paragraph and will be very similar to some of the content in the intro.

For the next section, **present the final values**. Many of the experiments require collecting a large amount of raw data, but including all of these values is not the point of this section. Only include the values or conclusions that directly relate to the experimental goal. Additionally, **compare** one trial to the next and/or compare the average value to literature values.

Finally, provide a source of error that may have resulted in discrepancies between trials or between experimental averages and accepted values. This description should go beyond simple factors like human error and should connect an aspect of the experimental design or procedural step to any discrepancies between the experimental and expected values. That is, explain how an error could have affected your result by following this error through the calculation process.

The conclusion will be submitted through CANVAS and is worth **5 points**.

Formal Laboratory Report. For the kinetics experiment, you are required to do a formal, typed report worth **50 points** that will contain all parts of the lab together in one document, rather than individual parts turned in separately, as in the other labs.

In scientific research, conveying what you have discovered in a clear, concise manner is essential to making your new ideas accessible to others and allowing your contributions to help the world.

It may feel like something completely new if you have not done a scientific report, and that is okay. We will not be doing everything that a manuscript would require but rather looking to gain familiarity with presenting an experimental study. I will talk about the specifics during the introduction for this lab, and I will provide an instructions sheet to help with the structure of this report.

Lab Final. The lab final will test your understanding of the theories utilized in lab sections this quarter as well as the calculations implemented to yield meaningful data. This exam will be Wednesday 8/3 during your lab time and is worth **100 points**. You will be allowed to use any notes you have taken throughout the entire quarter during this test, so it is beneficial to organize your work and pay attention during the lab introductions. No early or late exams will be allowed. No working with chemicals required.

Lecture Schedule

All dates, including exams and quizzes, are subject to change throughout the quarter. The final exam date will not change. Lecture topics are in black, holidays are in green, quizzes are in orange, and exams are in red.

Week Of	Week #	Monday	Tuesday	Wednesday	Thursday
6/27/22	1	Chapter 5 (Gases)	Chapter 5 (Gases)	Quiz 1 Chapter 5 (Gases)	Chapter 12 (IMFs)
7/4/22	2	Independence Day – NO LECTURE	Chapter 12 (IMFs)	Chapter 12 (IMFs)	Exam 1
7/11/22	3	Chapter 16 (Kinetics)	Chapter 16 (Kinetics)	Quiz 2 Chapter 16 (Kinetics)	Chapter 16 (Kinetics)
7/18/22	4	Chapter 17 (Equilibrium)	Chapter 17 (Equilibrium)	Chapter 17 (Equilibrium)	Exam 2
7/25/22	5	Chapter 18 (Acids/Bases)	Chapter 18 (Acids/Bases)	Quiz 3 Chapter 18 (Acids/Bases)	Chapter 20 (Thermodynamics)
8/1/22	6	Chapter 20 (Thermodynamics)	Chapter 20 (Thermodynamics)	Overflow/Review Day	Final Exam

LECTURE FINAL EXAM

Thursday August 4, 2:30 PM – 3:45 PM

Lab schedule

Lab topics are in black, holidays are in green, lab quizzes (LQ) are in orange, and the lab final is in red.

Week Of	#	Monday	Tuesday	Wednesday	Thursday
6/27/22	1	Syllabus/Locker Check-in	-LQ1 -Molar Volume of a Gas Part 1	-Molar Volume of a Gas Part 2	-LQ2 -Vapor Pressure Part 1
7/4/22	2	Independence Day NO LAB	Vapor Pressure Part 2	-LQ3 -Green Salt Part 1	-Green Salt Part 2
7/11/22	3	-Green Salt Part 3	-Green Salt Part 4	-LQ4 -Kinetics Part 1	-Kinetics Part 2
7/18/22	4	-Kinetics Part 3	-Kinetics Part 4	-LQ5 -Equilibrium Constant Kc Part 1	-Equilibrium Constant Kc Part 2
7/25/22	5	-Overflow/Study Day	-LQ6 -Ka/Kb of Weak Acid/Base	-LQ7 -pKa of Indicator Part 1	-pKa of Indicator Part 2
8/1/22	6	-LQ8 -Calcium Hydroxide Part 1	-Calcium Hydroxide Part 2	-Lab Final	-Check Out/Extra Office Hours

Homework

Homework will **NOT** be turned in for credit, but doing all of these is highly recommended for practice and overall concept mastery. These problems are chosen as the minimum needed to practice the topics, but you are strongly encouraged to go beyond the listed problems and try other problems throughout the book. Test questions will be similar to homework questions, so it is important to practice each problem and get help when you need it. I will release an answer key for the problems, but it will correspond to the 9th edition only.

Chapter	Problems
5	2, 7, 8, 9, 11, 14, 20, 23, 24, 27, 30, 33, 37, 45, 49, 55, 73, 74, 77, 82, 85, 88, 93, 99, 117
12	1, 4, 10, 11, 13, 15, 18, 24, 32, 38, 39, 40, 42, 49, 52, 63, 70, 72
16	Part 1 – 1, 3, 8, 10, 15, 20, 25, 26, 35, 42, 44, 47, 48, 49, 51, 54, 56, 61, 63, 92 Part 2 – 72, 75, 76, 80, 81, 87, 96, 113
17	2, 3, 4, 7, 12, 13, 16, 22, 29, 31, 35, 42, 45, 50, 51, 59, 61, 69, 70, 74
18	3, 4, 7, 12, 13, 15, 17, 19, 25, 31, 33, 35, 53, 56, 59, 69, 71, 83, 98, 110
20	2, 4, 5, 9, 13, 14, 17, 22, 23, 33, 38, 44, 49, 52, 54, 58, 63, 68, 75, 89, 104

Extra Practice. If you find yourself looking for more calculation practice, the book *Calculations in Chemistry* is very helpful in providing more practice. This book is listed as a required text for this class on the online bookstore, but please note it is not required. For a different/complementary explanation of concepts, there are many online sources, including the free online textbook, OPEN STAX.

Lab Safety/Preparedness

Maintaining safety when performing experiments is a primary concern. There are many hazards associated with chemistry labs, especially now that you will be experimenting in your house. It is essential to recognize these hazards and understand that with proper techniques, the risk drops significantly. There are a few very simple steps students should take to execute safe lab techniques.

First, always wear personal protective equipment (PPE) when performing lab experiments. Such items include, but are not limited to, safety goggles, long pants, sleeved shirts, and closed-toe shoes. **All of this safety equipment must remain on until you complete the experiment, including cleanup.** A detailed list containing safe lab procedures and general practices is given on the next and must be reviewed and signed before starting experiments.

Second, read the lab procedure BEFORE executing the lab procedure. Notes, facts, or some recognition of the hazards is required for the prelab to ensure the section on safety has been read. Reading the procedure ahead of time and knowing what tasks are at hand will also help the experiment go smoothly.

Finally, listen carefully to the directions provided by the instructor. Many techniques can be performed safely and easily with the proper technique but become a safety hazard when performed improperly

What follows is a list from the American Chemical Society Safety In Academic Laboratories Guidelines, 7th Ed., the following mandatory minimum safety requirements must be followed by all students and be rigorously enforced by all Chemistry faculty:

From the American Chemical Society Safety In Academic Laboratories Guidelines, 7th Ed., the following mandatory minimum safety requirements must be followed by all students and be rigorously enforced by all Chemistry faculty:

- 1)** Chemistry Department-approved safety goggles purchased from the De Anza College bookstore (NOT safety glasses) must be worn at all times once laboratory work begins, including when obtaining equipment from the stockroom or removing equipment from student drawers, and may not be removed until all laboratory work has ended and all glassware has been returned to student drawers.
- 2)** Shoes that completely enclose the foot are to be worn at all times; NO sandals, open-toed, or open-topped shoes, or slippers, even with socks on, are to be worn in the lab
- 3)** Shorts, cut-offs, skirts or pants exposing skin above the ankle, and sleeveless tops may not be worn in the lab: ankle-length clothing must be worn at all times
- 4)** Hair reaching the top of the shoulders must be tied back securely
- 5)** Loose clothing must be constrained
- 6)** Wearing "...jewelry such as rings, bracelets, and wristwatches in the laboratory..." should be discouraged to prevent "...chemical seepage in between the jewelry and skin...".
- 7)** Eating, drinking, or applying cosmetics in the laboratory is forbidden at ALL times, including during lab lecture
- 8)** Use of electronic devices requiring headphones in the laboratory is prohibited at ALL times, including during lab lecture
- 9)** Students are advised to inform their instructor about any pre-existing medical conditions, such as pregnancy, epilepsy, or diabetes, that they have that might affect their performance.
- 10)** Students are required to know the locations of the eyewash stations, emergency shower, and all exits
- 11)** Students may not be in the lab without an instructor being present
- 12)** Students not enrolled in the laboratory class may not be in the lab at any time after the first lab period of each quarter.
- 13)** Except for soapy or clear rinse water from washing glassware, NO CHEMICALS MAY BE Poured INTO THE SINKS; all remaining chemicals from an experiment must be poured into the waste bottle provided.
- 14)** Students are required to follow the De Anza College Code of Conduct at all times while in lab: "horseplay", yelling, offensive language, or any behavior that could startle or frighten another student is not allowed during lab;
- 15)** Strongly recommended: Wear Nitrile gloves while performing lab work; wear a chemically resistant lab coat or lab apron; wear shoes made of leather or polymeric leather substitute.

By signing below, I, _____,
First Name Family Name

acknowledge that I fully understand and agree to abide by the laboratory safety rules listed above. Further, I acknowledge that my failure to abide by these rules will result in my being dropped from this chemistry class immediately.

Signature

Date

Student Learning Outcome(s):

*Evaluate the principles of molecular kinetics.

*Apply principles of chemical equilibrium to chemical reactions.

*Apply the second and third laws of thermodynamics to chemical reactions.

Office Hours: