

## Welcome to Chemistry 1B, General Chemistry, Spring 2017

### Instructor:

Dr. Ian W. Jones

Office:

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### Sections:

CHEM 1B-Section 61 and 62

Lecture (61 and 62): TTh 6:00-7:15 pm, SC1102

Lab (61): TTh 2:30-5:20 pm, SC2204

Lab (62): TTh 7:30-10:20 pm, SC2204

This class is divided into two separate instructional periods: a **lecture period** devoted to the primary course material and a **lab period** focusing on experimental techniques and conducting lab experiments. One registration code automatically enrolls you in both periods. Everyone will have the same lecture period, but a different lab period depending on which code you used for enrolling.

**At De Anza College, the lab and lecture cannot be taken as separate courses under any circumstances. Once you are enrolled you may not switch lab lecture or lab periods whether on a temporary or on-going basis.**

### Student Learning Out Comes:

- **Student Learning Outcome:** Evaluate the principles of molecular kinetics.
- **Student Learning Outcome:** Apply principles of chemical equilibrium to chemical reactions.
- **Student Learning Outcome:** Apply the second and third laws of thermodynamics to chemical reactions.

### Office Hours:

TTh: 1 – 2 pm, PMSE Tutor Center (Come Find Me!!!)

### Required Materials:

1. Lecture text: <https://openstax.org/details/chemistry>

This is a free on-line textbook. You can view the textbook on line (free), download it as a pdf file (free), or purchase or rent a hard copy. Hard copies can be purchased on-line from OpenStax or from the De Anza bookstore for \$55 (or rented from the De Anza bookstore for about \$25).

2. Lab Manual: <http://www.deanza.edu/chemistry/Chem1B.html>

This is also free on-line lab manual

3. A scientific calculator that has at least log and exponential functions is required (~ \$12). NO GRAPHING CALCULATORS.

4. 8.5 x 11 permanently bound **laboratory notebook with duplicate copies**.

5. ANSI approved **laboratory safety goggles from the De Anza Bookstore**. Other types of goggles will not be permitted.

6. **Latex or Nitrile Gloves** available from the bookstore.

**Registration, Attendance, and Conduct Policy:**

Registration: Due to safety concerns, enrollment in each section is strictly limited to 30 students per section. Class spaces are filled in accordance with the official class roster from Admission and Records, followed by the official wait list. Any errors with registration or status must be addressed directly to Admission and Records. Please note that if you are placed in a section from the wait list, you will not be assigned a laboratory locker or be allowed to perform experiments until you are **officially** enrolled in the class.

Attendance: Attendance is expected during all lectures, all lab lectures, and all laboratory periods. Students are expected to be prompt and to leave only when lecture or lab is concluded. Arriving late to lecture is disruptive to the class and **strongly** discouraged. **If you miss lecture, laboratory lecture, or a laboratory period for any reason within the first two weeks of class, you will be dropped from the course.**

**Dropping the Course:**

If you choose to drop the course **at any point** during the quarter, it is **your** responsibility to withdraw from the course through Admissions and Records by the appropriate deadline. You are required to officially check out of your lab locker whether you remain in the course or drop the course. Failure to check out of lab by the scheduled check-out date will result in an administrative fee and a block will be placed on your future registration.

**OTHER IMPORTANT POINTS:**

**IF YOU MISS LABORATORY LECTURE OR A LABORATORY PERIOD FOR ANY REASON WITHIN THE FIRST TWO WEEKS OF CLASS, YOU WILL BE DROPPED FROM THE COURSE.**

**TWO OR MORE UNEXCUSED ABSENCES FROM LAB WILL RESULT IN AN AUTOMATIC "F" FOR THE ENTIRE COURSE.**

**IF YOU ARE DROPPED FROM THE COURSE DURING THE FIRST TWO WEEKS OF CLASS YOUR LOCKER WILL BE INSPECTED AND MAY BE REASSIGNED TO ANOTHER STUDENT. YOU WILL BE HELD RESPONSIBLE FOR ANY BROKEN OR MISSING LAB EQUIPMENT PRIOR TO REASSIGNMENT.**

**IF YOU FAIL TO CHECK OUT OF LAB YOU WILL ALSO BE CHARGED AN ADMINISTRATIVE FEE AND A BLOCK WILL BE PLACED ON YOUR REGISTRATION.**

Conduct: **The ringer on all cell phones and beepers must be turned off during lecture and lab periods.** Please only answer your cell phone if it is an emergency. Please notify me if you need to leave the lab for any reason. Students are also expected to abide by the Academic Integrity policy as outlined in the De Anza College catalog at all times. Students caught cheating or plagiarizing on any assignment will be expelled from the course and receive a grade of "F." If collusion between students to cheat can be demonstrated, each student will receive this same penalty.

**Assignments:**

Lecture Exams (2 x 150 pt)	= 300 pt
Unannounced Quizzes (Lecture and Lab)	= 100 pt
Final Exam	= 300 pt
Laboratory Notebook (7 x 5 pt)	= 35 pt
Lab Reports	
1-2 day experiments (5 x 10 points)	= 50 pt
3-4 day experiment (2 x 20 points)	= 40 pt
Laboratory Exam	= 75 pt
	= 900 pt

**Grade Scale:** A traditional 10 point grade scale will be used. However, no D's will be given, this means a larger C range and a closer F range.

**Exam Dates:**

Exam dates are provided and written in stone. The date and time for the final exam is set by the college and cannot be changed.

**NO EARLY, LATE, OR MAKE UP EXAMS WILL BE GIVEN.**

**Lecture Schedule and Homework:**

For Chem 1B we cover the following chapters in this order Chapter 9, Chapter 10, Chapter 12, Chapter 13, Chapter 14.1-14.4, and Chapter 16.

The homework is assigned, but not collected. You are expected to complete the in-chapter sample problems and follow up problems and work the end-of-chapter practice problems suggested on the course website. Here are a few more tips about studying for this course.

- 1) **Read** each chapter carefully before coming to class. Not every detail will be covered in lecture, but you are still expected to understand the whole chapter.
- 2) As you read the chapter, attempt to do the in-chapter sample and follow up problems and the corresponding end-of chapter practice problems. Exam questions will often be very similar to the problems mentioned above; therefore, make sure you can do all of these problems **comfortably** before an exam. Try to first do these problems without looking at the solutions. This is very important since you will not have a solutions manual/answers on an exam!! **Educational research tells us that it is just as important for your brain to see mistakes as it is for your brain to figure out the correct pathway. It also tells us that you must see the same information at least three times within 48 hours in order to retain that information.**
- 3) **DO NOT FALL BEHIND WITH THE READING OR HOMEWORK!!** This is the number one mistake you can make. Concepts in chemistry are like building blocks. Initially, you learn one topic to build up to larger concepts. If you are shaky on a topic early on, your whole foundation will be unstable. To avoid this, try to read ahead of the scheduled lecture topics and keep up with the homework.

4) In addition to completing the homework, it is also recommended that you discuss ideas and concepts with your peers in study groups and **come to office hours** to discuss ideas with me as well. There are usually several questions on the exam that will test your conceptual understanding and there will always **be at least one type of problem on the exam that you have never seen before to determine how well you can integrate ideas and concepts.**

#### **Lecture Exams:**

There are two lecture exams and one final exam. Material covered in lecture, in the assigned reading, homework, and activities will be on the exam. Make sure you can do **all** the assigned homework **without** struggling. Exam questions will always include questions that are similar to homework problems in addition to conceptual questions and **one or two questions that will challenge your understanding of the material (meaning you may have never seen this type of problem in the homework).**

The final exam is **cumulative** and is worth 300 points. The final exam is **not** one of the exam scores that may be dropped out of your overall course score. **No early, late, or make-up final exams will be given.** If you feel that any of your exams are graded incorrectly, you are always welcome to turn the exam in for a **complete re-grade at the end of the lecture or laboratory period on the day the exam is passed back.**

#### **Laboratory Notebooks:**

You are required to maintain a bound laboratory notebook with carbon copies. Each experimental procedure must be written in your lab notebook **prior** to performing the experiment. Although each lab procedure/prep is worth 5 points, it must be completed prior to the beginning of the lab or you will not be allowed to perform the experiment. This will result in zero credit for both the lab procedure/prep and the corresponding lab report. Guidelines for maintaining your laboratory notebook and the grading of your procedures are provided in the following pages.

#### **Laboratory Lecture**

Students are expected to attend **all** laboratory sessions. You must complete **all** of the laboratory experiments, and you must also participate in the **entire** laboratory session in order to receive credit for both the laboratory notebook and the laboratory report. Most labs are broken up into at least two lab periods. You must participate in both lab periods to receive full credit for the report.

**There are no make-up labs.** If you are unexcused from a lab period or fail to perform any part of a laboratory experiment, you will receive zero credit for the corresponding lab report. It is also your responsibility to understand the theory and use of the chemicals and equipment for any laboratory period that you miss in order to be prepared for the laboratory exams and lab final. **If you have a medical emergency or some other emergency that prevents you from attending lab, you will be asked to supply written documentation in order for the absence to be excused. Be sure to contact the instructor as soon as possible if you miss a lab session.**

**If you miss laboratory lecture or a laboratory period for any reason within the first two weeks of class, you will be dropped from the course. Two or more unexcused absences from lab sessions will result in an automatic grade of "F" for the entire course.**

### **Laboratory Reports:**

Guidelines for writing a formal laboratory report are provided at the end of this syllabus; however, not all lab reports will be formal lab reports. Some reports will be worksheets or spreadsheets and graphs that will be turned in at the end of lab. Although each report requires a different amount of work/effort, they are all worth the same amount of points because the information is equally important for each of them.

**No make-up labs or late lab reports will be allowed or accepted.**

Lab reports are due **one** week after the wet chemistry is completed unless otherwise noted. Ex. You complete the first lab on a Wednesday. The report is then due the following Wednesday.

### **Laboratory Exam/Final**

There is one lab exam for this course worth 75 points. The laboratory exams will be given during your regularly assigned laboratory sessions toward the end of the quarter. **No early, late or make-up lab exams will be given and all lab exam scores will count toward your overall course grade.**

### **Lab Schedule:**

Week of	Week	Tuesday	Thursday
4/10	1	Check-In	Molar Volume (1)
4/17	2	Molar Volume (2)	Vapor Pressure (Vernier) (1)
4/24	3	VP (Vernier) (2)	Green Salts (1)
5/1	4	Green Salts (2)	Green Salts (3)
5/8	5	Green Salts (4)	Green Salts (5)
5/15	6	Iodine Clock (1)	Iodine Clock (2)
5/22	7	Iodine Clock (3)	Iodine Clock (4)
5/29	8	Kc by Spec20 (1)	Kc by Spec20 (2)
6/5	9	Ka of a Weak Acid (1)	pKa of Indicator (1)
6/12	10	pKa (2)	Calcium Hydroxide (1)
6/19	11	Calcium hydroxide (2)	Check-out and <b>Lab Final</b>
6/26	12	No Lab	No Lab

### Lecture and Exam Schedule

Week of	Week	Tuesday	Thursday
4/10	1	Ch 9	Ch 9
4/17	2	Ch 9	Ch 10
4/24	3	<b>Exam #1</b>	Ch 10
5/1	4	Ch 10	Ch 12
5/8	5	Ch 12	Ch 12
5/15	6	Ch 13	Ch 13
5/22	7	Review Session	<b>Exam #2</b>
5/29	8	Ch 14.1 -14.4	Ch 14.1 -14.4
6/5	9	Ch 14.1 -14.4	Ch 16
6/12	10	Ch 16	Ch 16
6/19	11	Ch 16	Review Session
6/26	12	<b>Final Exam: 6:15-8:15 pm</b>	

### Partial List of Laboratory Safety Procedures

(Additional Information is found in the Laboratory Manual p.1-11)

- Students must comply with all safety procedures and precautions when attending a laboratory session.
- There are no provisions for making up a lab; therefore, you are expected to attend all scheduled lab sessions.
- You must have your laboratory procedures written prior to starting an experiment. Lab notebooks will be checked during lab and will be awarded between 1-5 points depending on completeness.
- Laboratory notebooks **must be written in ink** and all data must be written in the laboratory notebook. Scraps of paper containing data will be confiscated. Do not use "white-out." Use one line to cross out incorrect data.
- Lab lecture will consist of a discussion concerning safety for the experiment being conducted that day as well as information regarding experimental techniques.
- Eating and drinking is not permitted in the lab. **Do not** bring food or drinks to the lab even if they are in closed/sealed containers.
- If you are pregnant or think you are pregnant, it is your responsibility to consult with your physician before taking this course and performing the laboratory experiments.
- You must wear OSHA approved safety goggles and gloves at **all times** while in the laboratory. Failure to comply with this rule will result with your being expelled from the course and receiving a grade of "F."
- Appropriate attire must be worn in the laboratory. Shorts, open toed-shoes, and sleeveless shirts ("spaghetti straps") are **not** considered safe clothing for the laboratory. Clothing made of natural fibers are less of a hazard than those made of synthetic fibers.
- Do not begin the laboratory experiment (e.g. place any chemicals or glassware on the lab benches, turn on Bunsen burners, etc.) until the safety introduction is complete and everyone is wearing their goggles and gloves. The instructor will let you know when it is time to begin the experiment.

- In some cases, it will be necessary for the instructor to examine your “set up” before you begin the experiment. In these instances, the instructor will inform you of proper procedures at the beginning of class.
- If you come into contact with a chemical flush the affected area with water immediately for 15 minutes. Depending on the degree of contact with the chemical and the location on the body you may need to do this in the sink or safety shower. When using the safety shower, you must remove the clothing over the area that has come into contact with the chemical. The instructor will ask the other students in the class to leave the room for privacy.
- You will be wearing safety goggles at all times, but should you get a chemical in your eye, flush your eyes in the eye wash for at least 15 minutes.
- If your clothing or hair catches on fire use the safety shower immediately. If this is not possible “stop-drop- and –roll.”
- If you are hurt or think you have come into contact with a chemical, notify the instructor immediately (or send a lab partner to fetch the instructor) while following proper safety procedures.
- Know where the eyewash, safety shower, and fire extinguishers are located. (You should be able to do this with your eyes closed!)
- Chemicals should never be taken back to your lab bench. They must be kept in the fume hood in their proper storage containers. All chemicals and waste bottles must be capped after use. **Never** leave a chemical bottle or waste container uncapped.
- If a chemical spill occurs, notify your instructor so that she may help you follow the proper measures for cleaning up chemical spills.
- All waste must go into appropriate waste containers. Never throw anything down the sink or in the regular trash receptacles.
- Never pick up broken glass with your hands. Always use a brush and dust pan to sweep up broken glassware.
- If at any time the instructor feels that you are being unsafe and have not followed proper safety precautions and procedures, you will be asked to leave the lab, and you will receive zero credit for the laboratory report and notebook. You may also be expelled from the course and receive a grade of “F.”
- After completing an experiment clean up your lab space as well as glassware. Return all cleaned glassware and other equipment (e.g. Bunsen burners, clamps, steel rods, etc.) to the appropriate cupboards or stockroom.
- After you have completed an experiment and cleaned up your bench space and glassware, check out with the instructor.
- Remember to wash your hands immediately after completing the experiment and checking out. Also, change your clothes as soon as possible. This is especially important if you have children.
- **No makeup labs are allowed and no late** lab reports will be accepted.

## Guidelines Used for Maintaining a Lab Notebook

The following outline indicates the minimum amount of information that should appear in your notebook. On occasion, it may be necessary to include additional information in the notebook.

\* Indicates the material that must be completed **before** the start of each new experiment. The instructor will check this at the beginning of each new experiment.

\*\* Indicates the material that must be collected/completed **during** the lab session.

### For the Notebook in General:

\*Personal Identification:

Write your name on the outside cover of your notebook and include personal contact information on the inside cover of your notebook in case you should lose or forget your lab book.

\*Table of Contents:

The beginning of your lab notebook should contain a table of contents with the title of each experiment and the page number for each experiment. The table of contents may be updated as you complete each experiment.

\*Table of Reagents/Hazards:

Also at the beginning (or end) of your laboratory notebook is a Table of Reagents. **This is a cumulative table that has new additions added to it before each new experiment is started. Information for this table can be found on the appropriate MSDS sheets.** Although this table usually includes physical constants for each reagent used in the experiment, you will use this table primarily for safety and hazard information. Safety and hazard info usually includes LD50's, toxicities, and or information regarding physical contact with the chemical.

### For Each Laboratory Experiment:

\*Title and Date:

Each experiment should begin with the title of the experiment and the date it is performed.

\*Abstract:

Each experiment should also contain a brief summary that describes the main purpose of the experiment. A short description of the experimental techniques used and any pertinent **mathematical and chemical equations** should be included here.

\*Experimental Procedure:

The procedure is a detailed description of how the data is to be obtained. Use a two-columned format. In the left-hand column, you should include a step-by-step procedure that is outlined in the laboratory manual; however, **do not** copy straight from the manual. The procedure should be in your own words so that you have a complete understanding of how the experiment will be performed. **A complete stranger should be able to pick up your notebook and follow the procedure.** The right-hand column should be used for recording observations as well as any deviations from the planned procedure (see below)

\*\*Observations:

Observations are just as important as measurements. You should note any color changes, bubbles, instrumentation problems, etc. in the right-hand column next to the procedural steps.

\*\*Data and Calculations:

Data should be listed in a table or tables. The data tables in your notebook are a good guideline for the types of data tables that should be listed in your report. All data should be clearly labeled and should include the proper units of measurement. You may also be required to



graph your results. The graph should be done using Microsoft Excel and should have all axes labeled with the proper units. Print out of any graphs should be included with the report. Calculations should be organized in a logical fashion and they should be clearly labeled. For each type of specific calculation, you must show at least one sample calculation using your data. Make sure that appropriate units are also included in the calculations. For any "repeat" calculations you should list the results also in a table.

### **Guidelines for Laboratory Reports**

The following outline indicates the minimum amount of information that should appear in your report. On occasion, it may be necessary to include additional information in the report. All reports must be type written.

Title:

Include the title of the experiment at the beginning of the report.

Objective:

The objective should clearly state what are the key quantitative results that you are seeking in the experiment.

Procedure:

You have included the procedure in your laboratory notebook; therefore, there is no need to include the procedure here. Simply reference your lab notebook and the page numbers where the procedure can be found. You will be turning in the carbon copies from your notebook also.

Data and Calculations:

Data should be listed in a table or tables. All data should be clearly labeled and should include the proper units of measurement. You may also be required to graph your results. The graph should be included in this section and all axes should be labeled with the proper units.

Also, since your lab reports must be typed, you will need to learn how to use superscript and subscript notation. For example, the chemical formula for magnesium phosphate is  $Mg_3(PO_4)_2$  **not**  $Mg_3(PO_4)_2$ .

Calculations should be organized in a logical fashion and they should be clearly labeled. For each type of specific calculation, you must show at least one sample calculation using your data. Make sure that appropriate units are also included in the calculations.

Conclusion:

Without exception, all lab report conclusions are typed. These typed conclusions are turned in along with any graphs as well as copies of your laboratory notebook procedures, observations, data tables, and calculations. Also, since your lab report conclusion must be typed, you will need to learn how to use superscript and subscript notation. For example, the chemical formula for magnesium phosphate is  $Mg_3(PO_4)_2$  **not**  $Mg_3(PO_4)_2$ .

The conclusion for each laboratory experiment will differ depending on the experiment; however, there are always three main features that should be in the conclusion. First, your results should be presented as well as the expected or known values. You should include an explanation of any sources of errors that might explain why your results are different from the known or expected values. Finally, you should also include some discussion of the technique and theory that was used to perform the experiment and to explain the results. The conclusion is the most important part of the laboratory report!