

Welcome to

Chemistry 1A, General Chemistry

Fall 2017

Instructor:

Dr. Trevor McQueen
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Class Time and Location:

Section 61:
Lecture MW 6PM-7:15PM,MLC105
Lab: MW 7:30 PM-10:20 PM, SC 2202

Section 62:
Lecture MW 6PM-7:15PM, MLC105
Lab: TTh 7:30 PM-10:20 PM, SC 2202

Office Hours:

Monday 4:45PM-6PM

Tuesday 6:15PM-7:30PM

Course Information:

This class is divided into two separate instructional periods: a lecture period devoted to the primary course material and a lab period for conducting lab experiments. One registration code automatically enrolls you in all three periods. Everyone will have the same lecture period, but a different lab lecture and 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 Outcome Statements (SLO)

- **Student Learning Outcome:** Identify and explain trends in the periodic table.
- **Student Learning Outcome:** Construct balanced reaction equations.
- **Student Learning Outcome:** illustrate the principles of stoichiometry.
- **Student Learning Outcome:** Apply the first law of thermodynamics to chemical reactions.
- **Student Learning Outcome:** Gain familiarity with quantum concepts

Required Materials:

1. *Chemistry: The Molecular Nature of Matter and Change, 8th edition* by *Martin Silberberg* (McGraw-Hill)
2. On-line Chemistry laboratory manual <https://www.deanza.edu/chemistry/Chem1A.html> (Open Source)
3. Sign up to Connect: <http://connect.mheducation.com/class/t-mcqueen-fall-2017-mw>
4. A scientific calculator that has at least log and exponential functions is required (~ \$12). **Graphing calculators will not be allowed!**
5. 8.5 x 11 permanently bound **laboratory notebook with duplicate copies.**
6. OSHA approved **laboratory safety goggles from the bookstore.** Other types of goggles will not be permitted.
7. **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 a laboratory period during the first week of the quarter, you will be dropped from the course. **THERE AFTER 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 WEEK 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.

OVERALL COURSE GRADE:

Your final grade in this course will be determined based on a percentage scale as follows:

Online homework assignments	10%	Laboratory quizzes	10%
Lecture quizzes	20%	Laboratory assignments	10%
Midterm exam	20%	Pre Lab assignments	5%
Comprehensive final exam	25%		

Course grades will be assigned according to the following percentage scale:

A+ ≥ 97%	A ≥ 93%	A- ≥ 90%	B+ ≥ 87%	B ≥ 83%	B- ≥ 80%
C+ ≥ 74%	C ≥ 68%	D ≥ 60%	F < 60%		

Dr. McQueen reserves the right to change exam and quiz dates as well as modify the grade scale at any point during the quarter.

Tentative Exam Dates:

The dates are listed on the schedule provided. Be aware that exam and quiz dates may change depending on the timing of the material presented in lecture.

Final:

The final will be on Monday December 11th, 6:15-8:15PM

Lecture Schedule and Homework/Quizzes:

Students should plan to read 1.5-2 chapters per week. Homework is assigned, but not collected. The homework consists of completing the in -chapter sample and follow up problems as well as the end-of-chapter **red** practice problems. **We will be covering Chapters 1, 2, 3, 4, 6, 7, 8, 9, 10 and 11 in the Silberberg text.** Chapters 1 and 2 are review chapters that students are responsible for knowing from preparatory chemistry. Your quizzes will be similar to the homework problems.

No make-up or late quizzes will be given.

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 three 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).**

Only your top two lecture exam scores will count as part of your overall course grade. No early, late, or make -up exams will be given.

The final exam is **cumulative!** 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 duplicate copies. Each experimental procedure must be written in your lab notebook **prior** to performing the experiment. 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.

Only your top 10 laboratory notebook procedure scores will count toward your overall course grade.

Laboratory Lecture

Students are expected to attend **all** laboratory lectures and **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.

Only your top nine lab reports (worksheets) and the full lab report will count as part of your overall course grade. No make-up labs or late lab reports will be allowed or accepted.

Lab worksheets (except the full report) are due **at the end of the period once** the wet chemistry is completed unless otherwise noted. Check the website!

Laboratory Exam

There is one laboratory exam for this course worth 80 points. The laboratory exam will be given during your regularly assigned laboratory sessions at 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.**

Tentative Laboratory and Exam Schedule

WEEK OF	WEEK	MONDAY	WEDNESDAY
9/24/17	1	CHECK-IN Chapters 1 Problem Solving	MEASUREMENT (Modified Lab prep) Chapters 1 and 2 Matter
10/1/17	2	NOMENCLATURE (Modified Lab Prep) Chapter 2/ Quiz 1 Matter	HYDRATE (1) Chapter 3 Stoichiometry
10/8/17	3	HYDRATE (2) Chapter 3 Stoichiometry	PRECIPITATION (1) Chapter 4/ Quiz 2 Chemical Reactions
10/15/17	4	PRECIPITATION (2) Exam I (Chapter 1-3)	PRECIPITATION (3) Chapter 4 Chemical Reactions
10/22/17	5	TYPES OF REACTIONS (1) Chapter 4 Chemical Reactions	TYPES OF REACTIONS (2) Chapter 6/ Quiz 3 Thermochemistry
10/29/17	6	CONDUCTIVITY (1) Chapter 6 Thermochemistry	CONDUCTIVITY (2) Chapter 7/ Quiz 4 Quantum
11/5/17	7	ACID-BASE TITRATION (1) (Full Report) Exam II (Chapter 6-7)	ACID-BASE TITRATION (2) (Full Report) Chapter 7 Quantum
11/12/17	8	CALORIMETRY (1) Chapter 8/ Quiz 5 Electron Configuration	CALORIMETRY (2) Chapter 8 Electron Configuration
11/19/17	9	REDOX TITRATION (1) Chapter 9/Quiz 6 Chemical Bonding	THANKSGIVING
11/26/17	10	REDOX TITRATION (2) Chapter 9/10 Chemical Bonding/Molecular Shape	LINE SPECTRA Chapter 10/ Quiz 7 Molecular Shapes
12/3/17	11	MOLECULAR MODEL Chapter 11 Theories of Bonding	CHECK-OUT/LAB FINAL Exam III (Chapter 8-10)
12/10/17	12	FINAL EXAM 6:15-8:15PM	

De Anza Chemistry Department Safety Rules

(Please see the Website to find this as a separate form to sign)

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.

Additional Safety Rules

- 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.
- 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.”
- 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.
- 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.
- **No make up labs are allowed and no late lab reports will be accepted. All full lab reports (not worksheets) must be type written.**

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 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. **YOU WILL BE GRADED ON GRAMMAR.** Please have another person read your abstract. A short description of the experimental techniques used and any pertinent **mathematical and chemical equations** should be included here. Think about these questions when writing an abstract:

1. What is being determined in the experiment?
2. How will it be determined? What is the experimental technique?
3. Did I use enough detail? (Chemical names, concentrations, etc.)
4. Did I use the passive voice?

*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 Excell 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.

**Conclusion:

When asked a brief conclusion should be provided. Your instructor will let you know when this is necessary.

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 $\text{Mg}_3(\text{PO}_4)_2$ **not** $\text{Mg}_3(\text{PO}_4)_2$.

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 $\text{Mg}_3(\text{PO}_4)_2$ **not** $\text{Mg}_3(\text{PO}_4)_2$.

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!