Chemistry 1C: General Chemistry Section 01 and Section 02
Winter 2019

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Course Webpage: Canvas. *Turn on e-mail notifications to receive class announcements.*
Office Hours: Monday 12:30 – 2 pm, Wednesday 12:30 – 2 pm, Friday 9:00 am – 10:00 am.
Class Meetings
Lecture: MWF 10:30 am – 11:20 am, SC1102
Lab Section 01: MW 7:30 am – 10:20 am, SC2208
Lab Section 02: MW 2:30 pm – 5:20 pm, SC2208

Syllabus Statement
This course syllabus is a contract. Please read it carefully and completely in its entirety before asking me any questions regarding the course schedule, content, requirements, grading, etc. You are expected to adhere to the De Anza College Student Code of Conduct Administrative Policy 5510 at all times.

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. Everyone will have the same lecture period, but a different lab period depending on which section you are enrolled in. At De Anza College, the lab and lecture may not be taken as separate courses under any circumstances.

Official Course Description
This is the third and final quarter in the year-long General Chemistry sequence. In this class, advanced equilibrium concepts pertaining to solubility and buffers will be discussed. This will be followed with an introduction to electrochemistry, the chemistry of transition metals, and nuclear chemistry. The full course outline is available online at https://www.deanza.edu/catalog/courses/outline.html?cid=CHEM1C

Prerequisites
Completion of Chemistry 1B at De Anza College with a grade of C or better. You are expected to be proficient in intermediate algebra skills including linear analysis, logarithms, and anti-logarithms.

Hours
Three hours lecture and six hours laboratory will be spent in class. You should expect to spend an additional 8-12 hours a week studying and working on class assignments.

Attendance Policy
Your punctual attendance is expected at all lecture and laboratory sections of the course. If you will have to miss class for any reason, let me know by e-mail as soon as possible. The De Anza College Chemistry Department does not offer make-up labs under any circumstances. I will make some course announcements in lecture and lab.

Textbook and Materials
Required
1. *Chemistry: The Molecular Nature of Matter and Change*, 8th edition by Silberberg and Amateis. You are strongly encouraged to purchase this textbook from the De Anza College bookstore; however, we will not use McGraw-Hill Connect in this course.
2. A scientific calculator with natural log functionality. Phones and graphing calculators may not be used on exams or quizzes. I recommend the **TI-30XS calculator** which is available from multiple retailers.
3. The Chemistry 1C laboratory manual, available online on the course Canvas webpage.
4. ***TWO*** dedicated composition-bound laboratory notebooks with numbered pages. I recommend the National brand which can be ordered from Amazon: https://www.amazon.com/National-43571-Chemistry-Notebook-Narrow/dp/B0016OT7P8
5. Approved laboratory safety goggles (not safety glasses), available from the De Anza College Bookstore. Safety goggles *must* be ANSI-rated and approved by your instructor.
6. A box of nitrile laboratory gloves. ***You will not be permitted to work in lab without goggles and gloves***.
7. Stapler and staples.

Resources

1. Math, Sciences, and Technology Resource Center (MSTRC) Tutoring. The MSTRC offers tutoring for the Chemistry 1 sequence and is located in room S43 in the S-quad. Their website is: https://www.deanza.edu/studentsuccess/mstrc/
2. Disability Support Programs Services. The mission of DSPS is to ensure access to the college's curriculum, facilities, and programs. In particular, DSPS can help you get extended time on examinations. Their website is: https://www.deanza.edu/dsps/

Study Tips

1. Complete the assigned reading before coming to class. Review 1A, 1B, and algebra topics that are unfamiliar.
2. Take notes during class and review your notes regularly. Write down any questions you have and bring them to class or office hours.
3. Do a little bit every day. After every lecture, review the reading assignment and complete in-chapter and end-of-chapter exercises.
4. Join a study group. Work on practice problems together. The best way to learn the material is to teach it to somebody else.
5. If you feel that you are a poor test-taken, *complete and turn in all other assignments on time* in order to pass the class.
6. ***Do the practice problems and make sure you understand them.*** My students from previous quarters have told me that this is the best way to prepare for my exams. Attending lecture alone is not enough!
7. Take care of yourself! Stay well-rested and drink water.

Important Dates

Add Day:	January 19, 2019	Last day to *add* courses.
Drop Day:	January 20, 2019	Last day to *drop* courses without a withdraw being recorded.
Withdraw:	March 1, 2019	Last day to *withdraw* from the course.
Check-out:	March 20, 2019	Lab check-out day

If you drop or withdraw from the course, you must check out of your lab locker <u>on</u> the designated lab check-out day.

Exam Dates and Tentative Content

February 1, 2019	Exam 1: Chapters 13 and 19; related content from 1A and 1B
February 22, 2019	Exam 2: Chapter 21
March 15, 2019	Exam 3: Chapter 23
March 27, 2019	Final Exam: Chapter 24 and cumulative material

You may verify the date and time of the final exam at http://www.deanza.edu/calendar/final-exams.html. Note that students are responsible for taking final examinations at the scheduled time.

Lab Notebook Due Dates

January 16, 2019	Notebook A	Freezing Point Depression	20 points
February 4, 2019	Notebook B	Buffers	20 points
		K_{sp} and Common Ion Effect	20 points
February 20, 2019	Notebook A	Anions	20 points
		Electrochemistry	20 points
TBD	Notebook B	Cations – Group A	20 points
TBD	Notebook B	Cations – Group B	20 points
TBD	Notebook B	Cations – Group C	20 points
TBD	Notebook B	Cations – Group D	20 points

Grading Breakdown and Grade Scale

To succeed in this course, you will need to exhibit consistent and sustained effort throughout the quarter. This will be demonstrated through in-class practice problems, laboratory preparation and data analysis, and examinations. No assignments will be "dropped" from the final grade.

Lecture	66% of total grade
Practice problems	10%
Midterm exams	42%
Final	14%
Lab	**34% of total grade**
Notebooks	27%
Lab Final	5%
Clean-up	2%

Final %	Grade[1,2]
>100.0	A+
90.0 – 100.0	A
88.0 – 89.9	A–
85.0 – 88.9	B+
80.0 – 84.9	B
78.0 – 79.9	B–
75.0 – 77.9	C+
68.0 – 74.9	C
63.0 – 67.9	D+
55.0 – 62.9	D
<55%	F

[1]If your average in either the lab *or* lecture portion of the course is less than 55%, you will receive an F as a final grade.
[2]A+ grades will be given to students who demonstrate excellence in the following three areas: lecture, lab *and* class participation.

Lecture (66%)

Your attendance and active participation is expected at every lecture period. ***Due to the high number of students wishing to enroll in the course, any unjustified absences during the first two weeks of class will result in you being dropped from the course.*** Absences may be excused in case of a verified emergency (e.g. doctor's note or police report). If you know that you will not be able to attend lecture for any reason, let me know by email right away (even if only 5 minutes before class). Late arrivals and early departures are distracting for the whole class (and me!), so arrive on time and stay for the whole class period. I strongly encourage taking your own notes in lecture. I do not consider computers necessary for lecture; however, you may use an electronic device to take notes and reference relevant class material. Do not use your computers for non-course related activities during lecture. Put your phone on silent or Do Not Disturb while you are in class. If you must take a phone call in case of emergency, quietly leave the room before answering the phone.

Homework (0%)

Consistent practice is an essential component of learning, and homework questions will often be similar to exam questions. Recommended practice problems from the textbook will be posted for each chapter; however, homework will *not* be graded. It is your responsibility to keep up with suggested practice problems *every day****.***

In-class practice problems (10%)

Review questions will be posted and completed in class. Collaboration with your classmates is encouraged, and you may use any resource at your disposal. I will collect these problems and grade them for completion. Bring loose leaf paper and a writing utensil to class with you.

Exams (56%)

There will be three midterm exams and one final exam, each worth 14% of your final grade. Early and late exams will not be administered, and missing an exam ***will result in a zero without documented proof of a medical or legal emergency*** (e.g. hospitalization or car crash). If you require any accommodations for exams, you must be approved by DSPS.

Exams will consist of a mixture of short answer, calculation, and choice questions with the opportunity for partial credit. You must show your work for calculations in order to receive credit for any answer. You will be asked to demonstrate your conceptual understanding of the material *and* apply those concepts in an algebraic context to solve quantitative problems.

The final exam will be cumulative. The final exam will be administered on **Wednesday, March 27th from 9:15 am – 11:15 am**. This date and time are determined by De Anza College and cannot be moved under any circumstances. If you cannot take the final at this time, you should not enroll in the class. The final will not be administered at an alternative time under any circumstances.

Lab (34%)

Chemistry is an experimental science, and the laboratory is a major component of the course. De Anza College does not offer make-up labs, and ***you must attend the laboratory section that you are registered for*** to complete the required labs. Everyone gets one excused absence with no grade penalty. A second absence, regardless of the circumstances of your first absence, will result in a zero for the lab and all associated assignments. ***After a third lab absence, you will automatically receive an "F" in the course***.

Your timely attendance is expected at every lab. The beginning of each lab period is reserved for lab lecture. The lab lecture is a required component of the laboratory section and will include equipment demonstrations and essential safety information. ***If you miss lab lecture, you will not be permitted to complete that lab and it will count as a lab absence.***

You must clean up your work area before leaving each lab. Failure to do so will result in a loss of points for that lab. Before you leave lab, check-out with me. You will not receive credit for the lab unless I have signed your data.

Lab Notebooks (27%)
A laboratory notebook is an essential scientific tool. If you choose to continue your scientific education, you will perform original scientific research in your chosen field! This means that you will be the first person *ever* to perform some experiments. The lab notebook provides a convenient place to record all of your physical and mental activities for a set of experiments. In some cases, a lab notebook may become a legal document to establish intellectual property. For Chemistry 1C, all laboratory work (including calculations and analysis) must be handwritten in your lab notebook in black or dark blue ink.

For Chemistry 1C, you will need ***two*** dedicated (i.e. have not been used for a previous class or project) lab notebooks. I will collect the lab notebooks and grade the work presented in the lab notebook, and you will need the second to prepare for the subsequent lab experiment. The laboratory notebook is a ***permanent and complete record*** of the work you perform in lab. I recommend the following brand of lab notebook: https://www.amazon.com/National-43571-Chemistry-Notebook-Narrow/dp/B0016OT7P8. If you choose an alternate lab notebook, you must number all of the pages *before* you start using it. You must use a composition-type notebook for this class. Please note that any notebook with spiral binding will ***not*** be permitted. Please note the following lab notebook requirements

- Write your name, the class, quarter, “Notebook A” or “Notebook B”, and your contact information on the front cover. If you lose your lab notebook at any point in the quarter, this is the best way to allow it to be returned to you.
- All pages must be numbered in the upper outside corner.
- Only write on the right page. Do *not* write on the left (or back) pages. You may still number the left-pages.
- Leave the first three pages blank for a Table of Contents. As you complete each experiment, include the *Title of the Experiment*, the *Date(s) Performed*, and the *Page Numbers* where you can find the experiment.
- Always start a new experiment on a new page.
- The date of the experiment or work being performed must be written at the top of *every* page.
- All entries must be made in black or dark blue ink. If you make a mistake, simply strike the erroneous work with a *single line* and move on. Do not scribble over an error such that the original writing is obscured.
- Never use pencil in a lab notebook.
- Never use white-out in a lab notebook.
- Everything you do in the lab should be written in your lab notebook as you do it. Your lab notebook should be detailed enough that anyone can *exactly* reproduce your procedure and results.
- All data and observations must be directly recorded into your lab notebook. You may *not* write your data down on a separate piece of paper and rewrite it later.
- All calculations, using your data, must be performed in the lab notebook.
- Graphs, when appropriate, should be prepared in a spreadsheet program such as Excel or Google Sheets. Carefully label each axis, including units when appropriate. Remove titles from the graph. Include a figure caption below the graph that indicates what is being plotted. Print the graph and tape it in to your lab notebook with a clear tape such as Scotch tape.
- Before you leave lab for the day, you must have your instructor (me) review and sign your lab notebook.

Your lab notebook must be legible and organized. Take your time and come to lab prepared.

Lab Final (5%)
There will be one lab exam in this course. The lab final will be an open lab-notebook exam, and you may refer to any information that is handwritten in your lab notebook. In addition to the required pre-lab assignments, procedures, and data, I encourage you to include lab lectures notes, vocabulary, and example calculations. Extra pages (either printed or handwritten) may not be inserted. The final will cover material, calculations, and analysis related to your laboratory experiments.

Clean-up (2%)
Each student is required to sign up for one lab period in which they will be responsible for after-lab clean-up. This involves staying to end of lab, making sure the common lab areas and balance area is clean, the waste bottles are closed, etc. In addition, each student is responsible for cleaning their own materials and work area. Clean-up and check-out will start 30 minutes prior to the end of the class.

Laboratory Safety

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) **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.

Reckless behavior will not be tolerated. If your actions or attire endanger the health and safety of yourself or someone else you will be asked to leave and you will receive a zero for the day.

Lecture Schedule

Chemistry 1C will cover material presented in chapters 13, 19, 21, 23, and 24 of the Silberberg. The general chemistry sequence builds on prior material, so we will also review material from Chemistry 1A and Chemistry 1B.

Every effort will be made to keep to the lecture schedule below. If we fall significantly behind this schedule, the content of the exams will be adjusted to reflect the material that we covered in class. Exam dates will not be modified except in cases of *force majeure*.

Week	Date	Day	Lecture Topic ***Readings***	Lab
1	1/7	M	Chemistry 1A and 1B review	Check-in
	1/9	W	Silberberg 13.5 Concentration units and conversions Silberberg 13.1-13.4 Intermolecular forces and solubility as an equilibrium process	Freezing point
	1/11	F	Silberberg 13.6 Colligative properties	
2	1/14	M	Silberberg 13.6 Colligative properties	Freezing point
	1/16	W	Silberberg 18 Acid-base equilibria Silberberg 19.1 What is a buffer?	Buffers
	1/18	F	Silberberg 19.1-19.2 The common-ion effect Acid-base titration curves	
3	1/21	M	Martin Luther King Jr. Day ***No classes***	
	1/23	W	Chapter 19.2 Determine pH during an acid-base titration	Buffers
	1/25	F	Chapter 19.2 – 19.3 pH indicators Polyprotic acids The solubility product constant	
4	1/28	M	Silberberg 19.3 – 19.4 Applications of ionic equilibria Equilibria of complex ions	K_{sp} & common ion effect
	1/30	W	Silberberg 4.5, 21.1 Review of redox reactions Balancing redox reactions with the half-reaction method	K_{sp} & common ion effect
	2/1	F	**Exam 1: Chapters 13 and 19**	
5	2/4	M	Silberberg 21.1-21.2 Electrochemical cells Voltaic cells	Anions
	2/6	W	Silberberg 21.3 Electrochemical energy Calculating half-cell potential	Anions
	2/8	F	Silberberg 21.3 Spontaneous redox reactions	
6	2/11	M	Silberberg 21.4 Free energy and electrical work	Electrochem.
	2/13	W	Chapter 21.4 Free energy and electrical work	Electrochem.
	2/15	F	President's Holiday ***No classes***	
7	2/18	M	President's Holiday ***No classes***	
	2/20	W	Chapter 21 Review	Cations
	2/22	F	**Exam 2: Chapter 21**	
8	2/25	M	Silberberg 23.1 Transition metal elements Electron configurations	Cations
	2/27	W	Silberberg 23.1 Transition metal elements Electron configurations	Cations
	3/1	F	Chapter 23.1-23.2	

			Trends in physical properties across the *d*-block The *f*-block	
9	3/4	M	Chapter 23.3 Nomenclature of coordination compounds Common geometries	Cations
	3/6	W	Chapter 23.3 Coordination compound isomers	Cations
	3/8	F	Chapter 23.4 Bonding in coordination complexes: valence bond theory and crystal field theory	
10	3/11	M	Chapter 23.4 The spectrochemical series Case study: hemoglobin	Cations
	3/13	W	Silberberg Chapter 2 The atomic model Silberberg 24.1 Nuclear stability and radioactivity	Cations
	3/15	F	Chapter 24.2 Kinetics of radioactive decay **Exam 3: Chapter 23**	
11	3/18	M	Chapter 24.2 Kinetics of radioactive decay	
	3/20	W	Chapter 24.2 Radiochemical dating	Check-out **Lab final**
	3/22	F	Review	
12	3/27	W	***FINAL EXAM 9:15 AM – 11:15 AM***	

Lab Schedule

Week	Monday	Wednesday
1	Check-In Lab Safety Lab Notebook Orientation	**Freezing Point Day 1** Lab Notebook A
2	**Freezing Point Day 2** Lab Notebook A	**Buffers Day 1** Lab Notebook B ****Turn in lab notebook A****
3	MLK Jr. Day	**Buffers Day 2**

	No classes	Lab Notebook B
4	**Common Ion Day 1** Lab Notebook B	**Common Ion Day 2** Lab Notebook B
5	**Anions Day 1** Lab Notebook A ****Turn in lab notebook B****	**Anions Day 2** Lab Notebook A
6	**Electrochemistry Day 1** Lab Notebook A	**Electrochemistry Day 2** Lab Notebook A
7	*President's Holiday* *No classes*	**Cations Day 1** **Group A** Lab Notebook B ****Turn in lab notebook A****
8	**Cations Day 2** **Group A** Lab Notebook B	**Cations Day 3** **Group B** Lab Notebook B
9	**Cations Day 4** **Group B** Lab Notebook B	**Cations Day 5** **Group C** Lab Notebook B
10	**Cations Day 6** **Group C** Lab Notebook B	**Cations Day 7** **Group D** Lab Notebook B
11	**Cations Day 8** **Group D** Lab Notebook B	***Lab Final*** Check out

Student Learning Outcome(s):

*Apply the principles of equilibrium and thermodynamics to electrochemical systems.
*Apply the principles of transition metail chemistry to predict outcomes of chemical reactions and physical properties.
*Evaluate isotopic decay pathways.
*Demonstrate a knowledge of intermolecular forces.